

A systematic review of quantitative and qualitative research on the role and effectiveness of written information available to patients about individual medicines

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J Grime, DJ Nicolson, K Pollock, G Dorer,
S Gilbody, D Dickinson, AJ Maule and P Spoor



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Abstract

A systematic review of quantitative and qualitative research on the role and effectiveness of written information available to patients about individual medicines

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Objectives: To establish the role and value of written information available to patients about individual medicines from the perspective of patients, carers and professionals. To determine how effective this information is in improving patients' knowledge and understanding of treatment and health outcomes.

Data sources: Electronic databases searched to late 2004, experts in information design, and stakeholder workshops (including patients and patient organisations).

Review methods: Data from selected studies were tabulated and the results were qualitatively synthesised along with findings from the information design and stakeholder workshop strands.

Results: Most people do not value the written information they receive. They had concerns about the use of complex language and poor visual presentation and in most cases the research showed that the information did not increase knowledge. The research showed that patients valued written information that was tailored to their individual circumstances and illness, and that contained a balance of harm and benefit information. Most patients wanted to know about any adverse effects that could arise. Patients require information to help decision-making about whether to take a medicine or not and (once taking a medicine) with ongoing decisions about the management of the medicine and interpreting symptoms. Patients did not want written information to be a substitute for spoken information from their

prescriber. While not everyone wanted written information, those who did wanted sufficient detail to meet their need. Some health professionals thought that written information for patients should be brief and simple, with concerns about providing side-effect information. They saw increasing compliance as a prime function, in contrast to patients who saw an informed decision not to take a medicine as an acceptable outcome.

Conclusions: The combination of a quantitative and qualitative review, an exploration of best practice in information design, plus the input of patients at stakeholder workshops, allowed this review to look at all perspectives. There is a gap between currently provided leaflets and information which patients would value and find more useful. The challenge is to develop methods of provision flexible enough to allow uptake of varying amounts and types of information, depending on needs at different times in an illness. This review has identified a number of areas where future research could be improved in terms of the robustness of its design and conduct, and the use of patient-focused outcomes. The scope for this research includes determining the content, delivery and layout of statutory leaflets that best meet patients' needs, and providing individualised information, which includes both benefit and harm information. In particular, studies of the effectiveness and role and value of Internet-based medicines information are needed.



Contents

List of abbreviations	vii	Gaps in the evidence base	88
Executive summary	ix	Recommendations for future research	88
1 Background and objectives	1	Acknowledgements	91
Background	1	References	93
Review overview	3	Appendix 1 Workshop programmes	99
Research aims and objectives	3	Appendix 2 Search strategies	101
2 Methods	5	Appendix 3 Inclusion and exclusion criteria for selection of studies	109
Stakeholder workshop methods	5	Appendix 4 Data extraction coding form for studies of the role and value of written medicines information	111
Systematic review methods	7	Appendix 5 Data extraction coding form for trials of written medicines information effectiveness	115
Information design key informants review methods	13	Appendix 6 Effectiveness results	119
Synthesis methods	13	Appendix 7 Mapping patient-centred processes on to the effectiveness trials	135
3 Results	15	Appendix 8 Full list of texts cited by key informants	139
Workshop one	15	Appendix 9 Copies of interventions	141
Role and value review	16	Health Technology Assessment reports published to date	161
Effectiveness review	32	Health Technology Assessment Programme	175
Responses from health information and information design key informants	55		
Workshop two	64		
4 Discussion	67		
Role and value of written medicines information	67		
Effectiveness of written medicines information	72		
Discussion of information design key informants review	76		
Stakeholder workshops	77		
Synthesis of the three reviews and stakeholder input	78		
5 Conclusions, implications and recommendations	85		
Implications	85		



List of abbreviations

ABPI	Association of the British Pharmaceutical Industry	MHRA	Medicines and Healthcare Products Regulatory Agency (UK)
CCTR	Cochrane Controlled Trials Register	NHS EED	NHS Economic Evaluation Database
CDSR	Cochrane Database of Systematic Reviews	NRR	National Research Register
CMI	consumer medicines information	NRS	non-randomised study
CONSORT	Consolidation of the Standards of Reporting Trials	NSAID	non-steroidal anti-inflammatory drug
CRD	Centre for Reviews and Dissemination	OTC	over-the-counter
DARE	Database of Abstracts of Reviews of Effectiveness	PAGB	Proprietary Association of Great Britain
EMA	European Agency for the Evaluation of Medicines	PEC	Plain English Campaign
EPOC	Effective Practice and Organisation of Care (Cochrane Review Group)	PIL	patient information leaflet
FDA	Food and Drug Administration	RCT	randomised controlled trial
MCA	Medicine Control Agency	ReFeR	Research Findings Electronic Register
MEMS	Medication Event Monitoring System	SIGLE	System for Information on Grey Literature in Europe
		SPC	summary of product characteristics
		WMI	written medicines information

All abbreviations that have been used in this report are listed here unless the abbreviation is well known (e.g. NHS), or it has been used only once, or it is a non-standard abbreviation used only in figures/tables/appendices in which case the abbreviation is defined in the figure legend or at the end of the table.



Executive summary

Background

Everyone needs written medicines information at some time. Statutory information for patients is provided as manufacturers' patient information leaflets (PILs), included as an insert in the medicine package. This is the only written information every patient should receive about their medicine. There is a range of other sources of information that patients may receive from their healthcare provider or may access independently.

Objectives

This report addresses two main objectives.

- What are the role and value of written information available to patients about individual medicines from the perspective of patients, carers and professionals?
- How effective is this information in improving patients' knowledge and understanding of treatment and health outcomes?

Methods

Data sources

A range of full text and bibliographic databases was searched for research on (a) the role and value and (b) the effectiveness of written patient information for individual medicines (up to late 2004). Citation searching and handsearching were also carried out.

Six experts in information design were asked to cite relevant key references, and stakeholder workshops (including patients and patient organisations) were held at the beginning and end of the review.

Study selection

Abstracts and/or titles were assessed by two reviewers. The role and value studies were defined as examining the use and usefulness of written medicines information. Effectiveness trials [randomised controlled trials (RCTs)] examined how well-written medicines information works.

Data extraction

Role and value

These were grouped as arising from three perspectives: responses to policy initiatives; the uninformed patient and certainty of professional knowledge; and the informed, involved patient.

Effectiveness

This comprised descriptive, methodological and outcome data, classified in relation to treatment-related knowledge, attitudes or behaviour.

Data synthesis

Study characteristics were tabulated and the results qualitatively synthesised, along with findings from the information design and stakeholder workshop strands.

Results

Extent of research

From over 50,000 citations, 413 were considered. Of these, 64 papers reporting 70 studies were included (36 papers reporting 43 RCTs in the effectiveness strand and 28 in the role and value strand).

Study characteristics

The setting, timing and content of interventions varied considerably. Reporting of interventions and methodological quality was often poor. Outcome measures varied, and were mostly bespoke, precluding quantitative synthesis. Few studies used patient-centred outcome measures, addressed health professionals' perspectives or used web-based information.

Information design review and stakeholder workshops

The information design review yielded a list of key principles for application by writers of medicines information for patients. The stakeholder workshops proved invaluable in ensuring a patient perspective throughout, a model other researchers may find useful.

Key findings

Most people do not value the written medicines information they receive. The poor quality of

many leaflets tested, in terms of content and layout, may reflect the finding that provision, more often than not, did not increase knowledge. No robust evidence was found that the information affected patient satisfaction or affected compliance. Qualitative evidence shows that patients do not see improving compliance as a function of PILs; an informed decision not to take a medicine is an acceptable outcome. This contrasts with some professionals' view that increasing compliance was a prime PIL function.

There was consistent evidence that the way in which risk descriptor information is portrayed influences side-effect knowledge. Delivering risk information numerically, rather than as verbal descriptors, ensures a more accurate estimation of the probability and likelihood of a side-effect and the risk to health.

The readability of medicines information is important to patients, with concerns about complex language and poor visual presentation. Patients value the idea of information that is tailored, set in the context of the particular illness of the individual patient, and containing a balance of benefit and harm information. Very few studies addressed either issue. Most patients wanted to know about any side-effects that could arise. Some patients question the credibility of pharmaceutical industry information, although the required PIL is written according to strict regulations.

Patients would like written information to help decision-making, first for initial decisions about whether to take a medicine or not. Hence people value information about the range of treatments available (needed before the prescribing decision). Second, they need information for ongoing decisions about the management of medicines and interpreting symptoms. Patients did not want written information as a substitute for spoken information from their prescriber. Although not everyone wanted written information, those who did wanted sufficient detail to meet their needs.

Some health professionals thought that information for patients should be brief and simple. There was evidence of professional ambivalence about written medicines information; they did not always actively recommend leaflets and were in some cases reluctant to provide certain information, particularly on side-effects.

Conclusions

The combination of a quantitative and qualitative review, an exploration of best practice in information design, plus the input from stakeholder workshops allowed this review to look at all perspectives and explore issues not anticipated in advance. There is a gap between currently provided leaflets and information that patients would value and find more useful. The challenge is to develop methods of provision flexible enough to allow uptake of varying amounts of information on a variety of aspects, depending on needs at different times in an illness.

Implications for healthcare

To improve written medicines information, it is suggested that regulators and producers of written medicines information consider the following:

- Involve patients at all stages of the process, enabling their needs to be better reflected.
- Use findings on information design and content to improve the quality and usefulness of their products.
- Present risk information numerically rather than using verbal descriptors.

Spoken information remains the priority, but should be closely linked to written information so, in the authors' opinion, health professionals should:

- Ensure written information is not used as a substitute for discussion.
- Encourage patients to use written medicines information and welcome the questions this may raise.

Recommendations for research

In general:

- Apply recognised standards to trial design and conduct, recruit more older people, have longer follow-up and more use of naturalistic settings.
- Develop, validate and standardise patient-focused outcome measures.
- Investigate how patient input can be better integrated into medicines information research.
- Ensure the study of role and value alongside effectiveness in future trials.

Specific research areas that should be addressed are the following:

- Determine the content, layout, delivery method and timing of statutory medicine leaflets which best meet patients' needs.
- Investigate how individualisation, and benefit and risk information can be better incorporated.
- Study how to introduce more lay experience into the PIL development process.
- Undertake more studies of health professionals' perspectives, exploring incorporation of written medicines information into the consultation.
- Undertake more qualitative research on how different types of patients and carers use medicines information in different settings and over time.
- Implement studies of the effectiveness, and role and value, of emerging Internet-based medicines information.

Chapter I

Background and objectives

Background

Evidence-based policy and practice in providing written medicines information for patients is acknowledged as a priority, at both national and European levels, by consumers, professionals and policy makers. However, we still do not know how to do it well. This is the starting point for this review, which encompasses four elements:

- systematic review of research into the **effectiveness** of written medicines information
- systematic review of research into the **role and value** of written medicines information
- review of **information design** as it applies to written medicines information
- **stakeholder workshops** integrated into the review process.

Medicines, medicines information and people

Medicines are the most common intervention in the NHS and, as with all treatments, those taking prescribed medicines need sufficient information to enable them to:

- take and use the medicines effectively
- understand the associated risks and benefits, to allow an informed decision to be made about taking them.¹

It is estimated that around half of all patients do not take medicines as prescribed,² leading to waste of resources and suboptimal healthcare. Concern with medicine non-compliance was the main stimulus in the 1970s and 1980s for research into patient information needs and the development of a range of information materials. The rationale was that increasing patients' knowledge of treatment would be an effective means of reducing non-compliance, as evidenced by Ley's book, *Communicating with patients*, in 1988.³

More recently, an understanding has developed of the complex factors underlying patients' use of medicines, and that much non-compliance is intentional, rather than the result of ignorance and misunderstanding.⁴ It is apparent also that such 'self-regulation' of medicine taking by

patients is frequently not shared with doctors.⁵ Patients are being recognised as active managers of their own healthcare and need to be able to make reasoned decisions about medicine taking, in accordance with wider goals and aspirations.⁶

Evidence base and legislation

From the 1990s onwards, alongside developments in research relating to how people use medicines, legislation and guidelines linked to written medicines information have emerged in the developed world.⁷ Different models have developed, notably in Europe, the USA and Australia.

European Union (EU) legislation was introduced in the 1990s requiring a comprehensive medicines information leaflet to be supplied to patients inside the pack of every medicine (EC Directive 92/27)⁸ – fully implemented in 1999. The leaflets defined by this law are written and supplied by the manufacturer, according to the detail of the legislation, and delivered as a package insert. All information in the Summary of Product Characteristics (intended for health professionals) must also be included in the patient leaflet, but in a form comprehensible to the patient. Thus, all warnings, precautions and contraindications have to be included. The leaflet is usually folded and inserted inside the pack for the patient to read once they open the pack at home. Just prior to implementation of this law (in 1998), an EU Guideline on readability of the leaflets was issued, which included recommendations on describing the risk of side-effects⁹ and what to do about them. Also, the readability Guideline for the first time made recommendations on the testing of the leaflets with patients.

In Australia, law requires that a manufacturer's leaflet is available (with content conforming to legislation) with medicines when first supplied to a patient. A collaborative approach was adopted in the development of the regulations, involving all stakeholders. The leaflets are available as package inserts or are computer generated in the pharmacy. The latter can run to five pages of A4.¹⁰ In the USA, a voluntary system has prevailed since the 1970s, despite pressure from the Food and Drug Administration (FDA) and consumers.¹¹ The

leaflets are again computer generated, but briefer than those in Australia and Europe (usually one page long).¹² A target of 2006 for the supply of 'useful written information' with 95% of the first supply of a medicine has been set in the USA¹³ and recent FDA-sponsored research has given the best overview internationally of any of the national initiatives.¹²

In all countries, the legislated format is not the only form of information about individual medicines available to (and used by) patients.¹ Patients may be given additional written information (by health professionals, self-help groups or voluntary organisations) or may access it themselves from other sources, including the Internet.¹⁴ Research on all such sources of information about individual medicines will be eligible for the review.

Right to information and concordance

Current health policy priorities aim to develop higher quality and more responsive services, where patients' wishes and autonomy are respected.¹⁵ More pragmatically, they also aim to increase efficiency and cost-effectiveness. Providing good-quality information about medicines is a prerequisite for informed consent to treatment. It is also seen to underpin choice of treatment for patients and active involvement in managing illness. This characterises the concordance model of medical consultations.¹⁶ Concordance aims to achieve a shared understanding between patient and prescriber on treatment choices. Concordance is now often referred to as 'partnership in medicine taking'.

Patients may be more likely to take medicines when they have been actively involved in treatment decisions. However, increased knowledge may support patients' decisions **not** to take specific medicines, in addition to accepting them. The goal of concordance is not primarily to increase compliance (although this may be an outcome), but rather to improve the quality of healthcare by achieving a mutual understanding between patients and prescribers, and enabling patients to take a more active part in decisions about treatment and illness management where they wish to do so.

New methods of information delivery

The Internet is fast becoming a significant means of delivering healthcare information in general, and medicines information in particular. The potential benefits for those seeking online information about medicines are the same as for

healthcare information in general. Cline and Haynes¹⁷ suggest that benefits include:

- wider access to health information
- the capacity for interactivity and transaction
- the tailoring of information, making it more individualised.

The impact of medicines information produced electronically is starting to be felt. In Australia and the USA, computer-generated information in pharmacies is the mainstay of provision, and consumers can now also access official and unofficial information from the web. Many of the UK mandatory leaflets can be viewed online at www.emc.vhn.net and new web-based medicine 'leaflets' called Medicine Guides are being piloted (www.medguides.medicines.org.uk). Computer-generated medicine information leaflets are promoted as having the advantage of being easily updated, individualised and made usable for people with special needs. However, there is the fear that healthcare users may be confused or indifferent to the quality of such wider unregulated information available on the Internet.¹⁸ Any research of electronically generated information about individual medicines (which meet the criteria) will be included in the review.

Existing secondary research evidence

In the last 20 years, there have been a number of non-systematic reviews, including policy-related documents,¹⁹ which draw on the literature. Each tends to provide detailed information about specific aspects:

- psychological approaches,^{3,20} impact on knowledge and compliance,²¹ electronic generation,²² graphic representation,²³ user testing,²⁴ information design²⁵
- particular professional perspective (nursing,²⁶ pharmacy^{1,27})
- wider health information.²⁶

A review under way, led by two of the authors (PK, DKR; for the Cochrane Consumers and Communication Group), has the title: 'Written information about medicines for consumers'.²⁸ This covers a restricted aspect of this review (knowledge and satisfaction are the primary outcome measures and the review only covers controlled trials, and no qualitative research). The Cochrane review by Haynes and colleagues on interventions to improve adherence to medication includes written medicines information interventions, but only in a much wider context.²

Review overview

Health information and information design research context

Good information about medicines is important for enabling patients to understand their options and express preferences for informed decision-making. This review considers what changes might be needed in order that this information can enable patients to play as large a role as they desire. Considerations need to include, but go far beyond, practical considerations (such as font size) to how leaflets and other texts fit into effective communication between prescriber and patient, and how people actually use the information. The combining of qualitative and quantitative research in the review ensures that both aspects are covered.

The original proposal for this review was to conduct a systematic review of research on:

- effectiveness of written medicines information (trials examining how well it works) and
- role and value of written medicines information (studies examining its use and usefulness).

In addition, it was proposed to identify key elements from the:

- information design domain and
- health information domain,

which could inform best practice in written medicines information. The literature on written medicines information for patients is small in comparison with the wider literature on health information and information design in general. The literature on the last two areas is highly relevant, but represents such a broad area of work that it is outside the scope of the systematic review. However, there are many points in common between medicines information and information provided in other health settings, such as prior to investigations or surgery. In addition, there is a large body of evidence associated with the wider discipline of information design. Bearing in mind the objective of providing guidance to practitioners and policy makers, an additional stage was included in the review, where researchers in the relevant fields were consulted and key texts and reviews identified. The aim was to summarise the balance of evidence from these texts and highlight where the systematic review findings are supported or refuted by this expert opinion, and synthesise the findings into a narrative review.

Stakeholder workshops

It was subsequently proposed that an increased consumer input would be beneficial to the review; researchers and funders involved in medical and health-related research have recently begun to recognise the value of involving patients, healthcare professionals and other stakeholders in the research process. O'Donnell and Entwistle suggest that there are several reasons for doing this:²⁹

- Stakeholders have a right to know about the research.
- It increases both accountability and transparency and in doing so may lead to the research being more valued and trusted.
- Stakeholder inputs have the potential to improve the quality of the research.

As a result, two stakeholder workshops were devised to inform the review. It was a challenge to engage fully with consumers as co-researchers, given the nature of secondary research. However, it was concluded that the optimal way to increase consumer input was at two points:

- **Before the search is undertaken** – in order that their views are taken into account when shaping the review.
- **When the results are being formulated into a final report** – in order to understand better consumers' views of the findings, ideas for dissemination and priorities for future research.

The reviewers felt that these were the appropriate times when external input could be usefully applied to a systematic review.

Research aims and objectives

Aims

Systematic review

- What are the **role and value** of written information available to patients about individual medicines from the perspective of patients themselves, carers and professionals?
- How **effective** is written information available to patients about individual medicines in improving patients' knowledge and understanding of treatment, and improving self-management of illness and health outcomes.

Workshops

- The primary aim of the first workshop was to elicit stakeholders' perceptions of key issues

surrounding written medicines information, so that these could be taken into account when shaping, planning and executing the review, thereby enabling it to be user-centred.

- The primary aim of the second workshop was to elicit views about the review findings from the stakeholder groups involved in workshop one, in order to make interpretation of the findings and the conclusions drawn user-centred.

Objectives of the systematic review

The objectives were as follows:

- To identify and review systematically research on the impact, role and value of written medicine-specific information from the perspective of different stakeholders; in particular its effect on satisfaction, decisions about medicine taking and quality of patient–professional relationships.
- To identify and review systematically the quantitative research on the effectiveness of written medicine-specific information for patients (taking into account the content, tone, design and delivery method of the intervention).
- To draw on and integrate the body of research into health information and information design into this setting.
- To synthesise the evidence to produce guidance for NHS policy makers, regulatory authorities, the pharmaceutical industry and others who produce medicines information for patients.
- To identify gaps in the literature and direct future primary research.

Chapter 2

Methods

Stakeholder workshop methods

Multi-stakeholder workshops are an established method for achieving stakeholder input in research. Work in other academic disciplines has demonstrated the value of such workshops in helping to focus on stakeholder concerns and, in doing so, improve buy-in to the outcomes of research.³⁰ One of the team members (JM) has experience of using this technique in work commissioned by the Department of Health and the Food Standards Agency.³¹

Identifying relevant stakeholder groups

Stakeholders should be thought of as groups of individuals who have specific interests and concerns with respect to a particular issue. However, there are likely to be important differences between them in terms of:

- their understanding of the issue and expectations of the actions that should be taken by themselves and others
- the degree of engagement or stake that they have in the issue under consideration
- the power and influence they have to shape policy and practice associated with the issue.

Stakeholder engagement requires an explicit analysis of the 'power' and 'stake' that is inherent in different stakeholder constituencies. A meaningful engagement of stakeholders requires, as a minimum, that the following are included:

1. **High stake/high power** (for example, professional or pressure groups that are highly involved with the issue and can influence the development of policy and practice associated with the issue).
2. **High stake/low power** (for example, individual citizens who are highly involved in the issue but have little power or influence over the development of policy and practice).

For the present set of workshops, stakeholders were recruited from national patient organisations and a group of collaborators also involved with issues surrounding medicines information. In addition a group of high stake/low power

stakeholders were recruited, drawn from the general public, all of whom were regular medicines users. The following were invited:

- **Consumer representatives** from national patient groups (who have a high stake in issues surrounding medicine leaflets and have power to influence these issues).
- **Local consumers** (people taking medicines that have a high stake in issues surrounding medicine leaflets but have little power to influence these issues) were purposefully selected to cover a range of conditions and patient groups from the local Expert Patient Programme.
- **Study collaborators**, from the Medicines and Healthcare Products Regulatory Agency (MHRA), Association of the British Pharmaceutical Industry (ABPI), Proprietary Association of Great Britain (PAGB), NHS Direct OnLine, medicines website editor and Medicines Partnership Taskforce.

General organisation of the workshops

To meet the needs of the review, two workshops were planned. The first, run in the initial month of the study (October 2004), was designed to elicit stakeholders' views and perceptions of key issues surrounding medicines information so that these could be taken into account when shaping, planning and executing the review. The second, run at the end of the review (September 2005) when the report was being written, was designed to elicit stakeholders' views to assist in interpretation of the findings and the conclusions drawn.

Objectives of the workshops

The objectives were as follows:

- To provide a forum where participants and the research team could become acquainted with each other in order to build mutual trust and understanding.
- To promote joint ownership of the review.
- To gain important background information for the review on stakeholders' views about the importance and purpose of written medicines information, as well as the effectiveness and good and bad features of this information.

Specific objectives of the first workshop were to establish a shared understanding of:

- what the review involves
- how it will be undertaken
- what the outputs will be
- the stakeholders' role in the review.

The specific objectives of the second workshop were to gather from the three stakeholder groups their:

- expectations of the findings of the effectiveness and the role and value reviews
- responses to the actual findings from the effectiveness and the role and value reviews
- perceptions of the priorities for future research
- feedback on the stakeholder involvement process.

Workshop one

Participants

The first workshop lasted 4 hours and followed a structured format of group work and feedback, preceded by short presentations from the research team (see Appendix 1 for both workshop programmes). The stakeholders were seated in five groups around tables with two members of the research team allocated to each group (one to facilitate discussion and the other to write notes on the discussion).

The tasks

In the morning (activities 1–4 described below), groups were 'mixed', and included stakeholders from different backgrounds. In the afternoon (activities 5–7 described below), each stakeholder group sat at separate tables. The workshop involved the following activities:

1. A presentation welcoming participants with an explanation of the purpose of the workshop.
2. Group discussion of examples of good and bad medicines leaflets (participants were asked to bring examples with them to the workshop). The discussion also involved their personal experiences with medicines information, and also some consideration of what was useful or not useful, and why. They were also asked to identify the three most important aspects of medicines information.
3. An open forum, led by the facilitators, discussing responses to the previous activity, noting common issues and problems, in order to gain an understanding of the common needs and concerns of medicines users.

4. Presentations from the research team on medicines information and the kinds of research that have been undertaken in the past and an explanation of the nature of a systematic review and their role in it.
5. Group discussion of those aspects of medicines leaflets considered important by participants.
6. An open forum, led by the facilitators, discussing responses to the previous activity, noting common issues and problems in order to enhance understanding of needs and concerns of medicines users.
7. A closing discussion outlining plans for the future, including the purpose of the second workshop.

Analysis of the findings

From written summaries of the group discussions, one researcher (DN) produced a thematic analysis of common points of discussion and responses. Other team members then moderated this analysis. While each question generated a lively and broad discussion within each group, only the most frequently occurring responses were abstracted and used in the review.

Workshop two

The tasks

Following a brief introduction, participants again engaged in a series of activities interspersed with brief presentations of the findings by the research team. To achieve the workshop objectives, participants engaged in four different facilitated activities. In each case, the activity was first introduced by a member of the research team in the form of a question. Then participants were given approximately 2 minutes to think about their responses before discussing them in their groups. It was suggested that they might write down their thoughts and ideas in a specially produced notebook. The notebook was divided into different sections that included a typewritten version of each question and a space underneath for the participants to write their notes and ideas. Following this, there was a general discussion among the group members that was facilitated by a member of the research team, and recorded in the form of written notes by a second member of the research team. The notebooks were collected at the end of the workshop and were analysed along with the notes of the group discussion.

The activities undertaken asked attendees to indicate:

1. what they hoped had come out of the review
2. their response to the role and value review

TABLE 1 Databases searched and number of references retrieved

Database	Number of references
CINAHL: 1982 to October 2004	13,575
Cochrane Library Issue 4, 2004 (CENTRAL, Cochrane Database of Systematic Reviews, DARE, HTA database NHS EED)	1,353
Digital Dissertations: 1980 to November 2004	120
EMBASE: 1980 to September 2004	14,254
HMIC (Health Management Information Consortium): 1970 to October 2004	821
Index to Theses: 1970 to October 2004	10
ISI Proceedings: 2000 to November 2004	266
MEDLINE: 1970 to October 2004	16,151
Pharmline: 1978 to October 2004	894
PsycINFO: 1970 to October 2004	1,390
Sociological Abstracts: 1970 to October 2004	67
WoS (Web of Science) 1970 to October 2004	1,226
Total	50,127

findings, having been given a brief 15-minute presentation outlining the primary aspects of these findings

3. their responses to the effectiveness review findings having been given a brief 15-minute presentation outlining the primary aspects of these findings
4. their thoughts about what should happen now as a result of the review.

At the end of the workshop, all participants completed a short questionnaire to elicit their views about the workshop.

Analysis of the findings

Analysis of the findings used the same procedure as adopted in workshop one with the addition that the handwritten notes of participants were analysed in addition to the notes taken of the group discussions.

Systematic review methods

Electronic database search strategy

A range of full text and bibliographic databases (see *Table 1*) was searched for published and grey literature on the effectiveness and role and value of written patient information for individual medicines.

The sift audit trail was documented, highlighting the number of papers at each stage of the search process, in *Table 2*.

Strategy development

The same search strategy was used to find studies for both the effectiveness and the role and value parts of the review. A comprehensive search strategy using a mixture of thesaurus terms and keywords was developed iteratively in MEDLINE. The results of preliminary searches were scrutinised and the title, abstract and MeSH terms from relevant papers used to improve the search strategy. Terms relating to the intervention (i.e. written medicines information) were initially combined, using the Boolean operator AND, with terms relating to medicines, such as drugs, prescriptions, but this strategy missed a significant number of potentially relevant papers that were already known to the research team. To supplement this approach, recall was improved by AND-ing the thesaurus term 'Patient Education' with each of the other terms in the search strategy. The search strategies are listed in Appendix 2.

Differences between US and UK terminology made refinement of the strategy difficult. For example, in the US the term 'labeling' is used to describe patient information leaflets supplied with a medicine, as well as information provided on the label.

The need to search for common words such as 'medicines', 'patient' and 'information' made the construction of keyword searches problematic, particularly in health databases. This difficulty

TABLE 2 Sift audit trail

References identified by database search	50,127
References excluded from title and/or abstract	49,714
Papers retrieved from sift	413
Papers found from additional search strategies	4
Total number of papers retrieved	428
Papers excluded as not meeting inclusion criteria	355
Papers later excluded from analysis because of inadequate reporting of data	9
Total number of papers finally included in the review	64
• 36 papers for the effectiveness review	
• 28 for the role and value review	

was addressed to some extent by the use of adjacency searching, but it still resulted in a search strategy which was sensitive rather than specific.

The problem of defining **role and value** and translating these into a finite list of searchable keywords meant that a very broad strategy was required to find studies relevant to this part of the review. The search results were cross-checked against 18 known key articles (see Appendix 2) and modified where necessary to ensure that the searches were sufficiently sensitive to identify these papers.

The sensitive search strategy required to ensure that papers relevant to the role and value part of the review were not missed, resulted in a total of 50,127 references being retrieved. The final yield from the search results was very low but most irrelevant papers retrieved could be eliminated quickly and easily on the basis of title or abstract alone. When there was any possibility the study might be relevant, the full paper was obtained.

Search restrictions

For the effectiveness part of the review, where the aim was to identify RCTs, a methodological filter could have been used to improve specificity, but as all study designs were potentially relevant to the role and value review, no methodological filter was applied.

Searches were limited to English language material because of problems of analysing role and value findings written in a foreign language. In accordance with the review proposal, date limits were used to restrict the searches to material published from 1970 onwards. Databases of ongoing research such as the National Research Register (NRR) and Research Findings Electronic Register (ReFeR) were not searched. The System

TABLE 3 Journal tables of contents searched online

<i>Pharmaceutical Journal</i>
<i>Qualitative Health Research</i>
<i>International Journal of Pharmacy Practice</i>
<i>Sociology of Health and Illness</i>
<i>Patient Education and Counseling</i>
<i>Social Science and Medicine</i>

for Information on Grey Literature in Europe (SIGLE) was not searched because it has ceased publication.

Additional strategies

To augment the electronic searches, the reference lists of papers reporting studies included in the review were scrutinised for additional studies. Information about unpublished research was sought from a variety of sources.

It was expected that the role and value part of the review might be based primarily on qualitative studies, which would be difficult to search for. Therefore, to counteract possible shortcomings in the database search strategies in relation to the role and value review, it was planned to augment these searches by two methods: handsearching and citation searching. In the event, the majority of studies included in the role and value review were quantitative.

Handsearching

It was planned to supplement the electronic database searches with handsearching of six core journals (*Table 3*), which were primarily selected because we hoped they would include role and value studies. All of these journals were indexed by at least two of the electronic databases searched and, given the extremely sensitive nature of the search strategy which was eventually developed, the value of handsearching was called into question. To test its possible value, the table of

TABLE 4 Most common reasons for exclusion

Non-empirical studies	156
Not a randomised controlled trial (applicable only to the effectiveness review)	48
Written information in a study not about a medicine	58
Readability formula study	19
Review/systematic review	13
Study met inclusion criteria but could not be included due to inadequate reporting of data	9
Study of written information effectiveness (not medicines information effectiveness)	6
Not English language report	5
Studies excluded for other reasons	50

contents of each of the journals was reviewed for 2000–4. No additional papers were discovered by this process. A decision was taken that handsearching was not justified for the reasons above, and because we considered citation searching was likely to be more fruitful for identifying further role and value papers.

Citation searching

Citation searching was applied to the references cited in those role and value papers that were identified by searching electronic databases and which met the inclusion criteria for the review. The citation searching was carried out in the Web of Science database in July 2005. Each of the papers identified for inclusion in the role and value review was searched for in the Web of Science database. Papers that cited these studies were then identified using the *Times Cited* feature within Web of Science.

The 28 role and value papers had been cited 209 times. Of these 209 papers, 137 had not been identified by the original database searches. Scrutiny of the titles and abstracts of these 137 new papers by one reviewer eliminated irrelevant articles and the remaining 49 papers were examined in full by two reviewers. One additional study was found which met the inclusion criteria for the review.

In addition, the *Find Related Records* facility in the Web of Sciences database was used to find papers whose reference lists included at least one of the sources cited by the original 28 studies in the role and value review. Using this method, 6678 papers were found. When these were compared against the results of the electronic database searches, 4674 unique records were found. One reviewer scrutinised these 4674 papers. One met the inclusion criteria for the role and value review and was included in the study.

Bibliographies of reviews and included studies

The same electronic databases as above were searched to find systematic reviews. No systematic reviews were identified, but five narrative reviews were found.^{21,22,26,32,33} The reference lists of these reviews were searched to find additional references. Of the 10 additional references found using this process which were potentially relevant, two met the inclusion criteria.^{34,35}

Unpublished research

Representatives from the national patient organisations (Diabetes UK, Multiple Sclerosis Trust, Asthma UK and Arthritis Care) and the other bodies who attended the stakeholders' workshop (Patient UK, NHS Direct OnLine, ABPI and MHRA) were asked if they knew of any relevant unpublished research. No additional studies were identified by this route.

Inclusion and exclusion criteria for selection of studies

Inclusion and exclusion criteria were based on:

- populations and settings
- interventions for both strands of the review.

Only RCTs were considered in the effectiveness review. The most common reasons for exclusion of a retrieved paper are given in *Table 4*. The full inclusion and exclusion criteria are given in Appendix 3.

Sifting process

One reviewer sifted references on the basis of title and abstract, coding each as 'no', to denote that it was definitely not relevant to the review, or 'yes', to indicate that the reference was potentially or definitely relevant. A second reviewer checked all 'yes' decisions and a random 10% of 'no' decisions.

As such a large number of references had to be dealt with, sifting was shared among six reviewers, with one reviewer having overall responsibility for coordinating this task. Differences were reconciled by discussion or, if necessary, by the intervention of a third party. After an initial sift of all articles, there were 677 references that were considered to be potentially relevant to the review. A final check of these 677 papers was carried out by a third reviewer, who has expert knowledge in medicines information and pharmacy practice. A further 264 references were excluded at this stage and the remaining 413 references were retrieved as papers.

Final selection of studies for the review

Two reviewers independently checked the 413 retrieved papers for inclusion in the **effectiveness** review. Disagreements were reconciled by discussion (or by a third reviewer's arbitration). This process was independently replicated by reviewers for the **role and value** review. Reviewers made a distinction between studies which were potentially role and value or effectiveness studies:

- Role and value studies were defined as those examining the use and usefulness of written medicines information.
- Effectiveness trials examined how well written medicines information works.

At the end of this process, four reviewers had agreed on which papers were to be included or excluded from the review.

Seven effectiveness papers were subsequently excluded: three because specific outcome measure data could not be determined (and extracted),^{36–38} two because they did not present data for individual arms^{39,40} and two because they did not isolate the effect of written medicines information alone.^{41,42} Two role and value papers were excluded at the data extraction stage because it was considered that they had both methodological limitations and limited relevance for the review.^{43,44}

Design of studies identified

Role and value

It had been envisaged that the methods employed in research studies relevant to role and value would be qualitative. However, many of the studies retrieved were surveys and some were laboratory based. It was decided to include these if the rationale for the study included investigating the use and usefulness of written medicines information for patients.

Effectiveness

As the retrieval of few randomised controlled trials (RCTs) was anticipated, consideration was given to including evidence from non-randomised studies (NRSs). From the analysis of the results of the database searches, it was evident there were more RCTs than expected. For this reason, only RCTs were included and therefore it was not necessary to consider including other study designs in the effectiveness strand of the review.

Data extraction

For both aspects of the review, a reviewer who was an author of any included papers did not extract data from their own papers.

Role and value

Other systematic reviews were considered that included qualitative studies to examine the data extraction forms used. Several were based on 10 critical questions to appraise qualitative studies,⁴⁵ and we adapted one sent to us by Professor T Greenhalgh that had been developed for a systematic review of research into innovation and diffusion⁴⁶ (see Appendix 4). The advantage of this form over the others was that it included a summary section which was completed after working through the 10 appraisal questions. The summary questions asked the reviewer to consider whether the findings reported by the authors were demonstrated in the data or were assumed.

This data extraction form was used for both the quantitative and qualitative studies. Two reviewers independently completed a data extraction form for each study. One of the reviewers compared the two completed forms. Where differences were evident, the reviewers met to discuss and resolve them.

In qualitative papers, authors are often constrained when reporting their methods and findings because of journal restrictions on word length. It was recognised that concise reporting of qualitative studies possibly impacted on this review of qualitative papers. Therefore, it was decided to send completed data extraction forms to authors of seven of the nine qualitative studies to seek their response to this analysis of their study and to ask for any extra information they had. Six replied. For one of the qualitative studies, a book detailing the research had been published prior to the paper that was included in the review. A data extraction form was not sent to these authors since there was access to the book, nor was one sent to the author of the paper who carried out an arguably

qualitative content analysis of medicines information leaflets.

Effectiveness

Data extraction of the RCTs covered the following areas:

1. publication details
2. funding source for the study (if reported)
3. reporting of the study design (if a non-standard RCT)
4. intervention category
5. a succinct summary of the intervention and control
6. participants' characteristics
7. demographic data
8. quality assessment (see also below)
9. outcome data. We extracted outcomes pertaining to three generic categories:
 - (a) treatment-related knowledge
 - (b) treatment-related attitudes
 - (c) treatment-related behaviour.

Full details of the data extraction categories are given in the RCT data extraction coding form in Appendix 5.

Quality assessment

Role and value

For the role and value review, the purpose of the data extraction form was to provide a comparative structure as a basis to reflect on the study, in order to decide on the key messages about the role and value of written medicines information for patients. However, if a study was considered to have many important methodological limitations and the findings were insufficiently related to the topic of our review, then it was not included. Two such papers were eliminated at the data extraction stage.

Effectiveness

The assessment of the quality of included RCTs followed Centre for Reviews and Dissemination (CRD) guidelines⁴⁷ and the Delphi list for quality assessment of RCTs.⁴⁸

The quality of the trials was considered in relation to the following criteria:

- blinding of the outcome assessor to the intervention
- randomisation
- concealment of the allocation process from the investigator
- whether trials reported loss to follow-up, that is, how many participants did not have a final outcome measure.

It was also noted whether trials reported baseline comparability. Full details of the criteria for the assessment of the quality of trials are given in the RCT data extraction coding form in Appendix 5.

Assessment of the intervention in the effectiveness trials

The written medicines information intervention was assessed in three ways. First, by using the European Commission (EC) (1998) categorisation for written medicines information which gives five items of information to be contained in all medicine leaflets:⁹

- what this medicine is and what it is used for
- before taking the drug
- how to take the drug
- possible side-effects
- storage.

Second, further categories were devised that would assess the presentational style and content of the intervention. Development and application of a comprehensive tool to assess these factors were outside the scope of the review, so a key indicator for each aspect was adopted:

1. 'Easy-to-read', which judged whether the leaflet used plain language which a lay person could understand.
 - (a) Key indicator – the absence of complex words or unexplained jargon.
2. 'Layout', i.e. if the leaflet used good practice in information design.
 - (a) Key indicator – the inclusion of headings which were distinct from the main text.

The use of such key indicators gives only a sign of whether the authors paid some attention to the needs of the reader – a positive result does not mean that they show excellence in information design.

It was also noted whether or not the intervention had been developed explicitly with reference to a theory or previous empirical study and whether a copy of the intervention was provided in the paper or subsequently obtained.

Categorisation of the effectiveness trials

The trials were categorised according to the interventions compared:

- *Written medicines information versus nothing*, where the difference between the two groups isolates the effect of written medicines information.

- *Written medicines information + verbal information versus verbal information*, where the difference between the two groups isolates the effect of additional written medicines information.
- *Written medicines information versus written medicines information*, where the difference is the relative effect of one written medicines information compared with another, as in a 'head-to-head' trial.
- *Written medicines information versus various*: this was for trials which (for example) had both a comparison intervention and a control arm.
- *Written medicines information risk descriptor versus written medicines information risk descriptor*: the difference is the relative effect of one risk descriptor compared with another, as in a 'head-to-head' trial.

A description of the trials and assessment of the quality of the methods and interventions was reported for each of the five categories above. For each category, trial outcomes were presented for the broad categories of knowledge, attitudes and behaviours.

Analysis of data

Role and value studies

On the data extraction form, the reviewers recorded the main findings stated in each paper. This was straightforward for the quantitative studies. However, recording the results of the qualitative studies involved comparison of what authors said in the discussion with data in the results. Four included studies were undertaken with different objectives from those of the review. Two of the studies, which were surveys (by Blom and Rens,⁴⁹ and Thompson and Stewart⁵⁰), had a broader focus on verbal and written information. The process of data extraction and analysis was no different for these. The other two studies (one qualitative, by Hughes and colleagues⁵¹ and the other mixed methods, by Ross and colleagues⁵²) had a specific focus which did not fully integrate with the objectives of the review.

However, their study topics [patient knowledge and perceptions of side-effects from over-the-counter (OTC) medicines and how to develop an information leaflet on oral contraception] produced primary data of relevance to the review and (in the case of the leaflet development study) insight into how health professionals evaluate written information. For these two studies (particularly the latter), the findings that were analysed included not only the findings as reported by the author, but also what the reviewer felt they had learned about the researchers' perceptions of the role and value of written information.

At the end of this process we had a list of ways in which patients or professionals used written information (for example, to find out about side-effects or to check that the right medicine had been prescribed), and a set of factors on which patients or professionals based their evaluation of the material (for example, the level of detail or the presence of certain information in the leaflet). The next step was to consider whether the uses and factors underpinning the evaluation of written information identified in the paper were actually demonstrated or assumed by the author. For example, in some studies views were sought about written information on a medicine from patients who were not taking the medicine. These are referred to as hypothetical studies. An assumption was made in most of these papers that the findings from hypothetical patients also held for 'real patients', that is, people actually taking the medicines concerned.

Because researchers had employed different methodologies, in a variety of contexts and with different perspectives of the role of patients and doctors, a narrative synthesis method was used. Similarities and differences in the findings were sought. Common uses and evaluation of written information were identified and contradictory findings were probed to consider factors which might explain the differences. The findings were written up as a narrative account.

The synthesis of qualitative findings in systematic reviews is still a new and developing discipline. The Cochrane group on qualitative methods acknowledges a need for methodological work on combining studies using different qualitative methods and data types.⁵³ First, some predefined issues were taken, such as the extent to which information changed the patient's or practitioner's attitude to the medicine or the way in which information did or did not meet expectations. The review also focused on the extent to which the various possible benefits and disbenefits of medicines information provision were seen as important to patients and practitioners. Additional themes and issues that emerged from the analysis were identified and searched for systematically across the published studies.

Effectiveness studies

A meta-analysis of the results was not performed because the outcomes were too disparate, for example, often a bespoke knowledge questionnaire. For this reason, only a descriptive analysis of the results is presented. The reviewers interpreted

together the data for all trials with a knowledge outcome, with an attitudes outcome and with a behavioural outcome across the five intervention categories, to highlight the general effectiveness of providing written medicines information on knowledge, attitudes and behaviour. The rationale for synthesising the results in this way was to find the general effect of written medicines information for each outcome category.

Missing data

Effectiveness studies

Missing data request letters were sent to authors of 23 papers by email and the remaining 12 by post. The authors of 15 papers replied to the requests. Three requests were made to the authors:

- To provide a copy of the leaflet(s) that formed the intervention (when one was not already available).
- To highlight if the design or content of the leaflet was theory or evidence-based, and if there was a rationale for choosing the leaflet used.
- To provide further information and clarification about the methods used in their study.

Where a trial had specific missing outcome data, we added this request to the relevant letters.

Information design key informants review methods

Information design key informants

The chosen process was to ask six experts in information design (so-called key informants) to nominate key texts on best practice in information design. Three members of the research team independently nominated information design specialists who had particular expertise in this area. Nominations were pooled and a consensus achieved to agree the final selection. The preliminary list was shared with the key informants themselves and asked if any others should be included. No further informants were identified. The letters to the key informants said:

“We ask you to identify **3 key works** which we can use to determine best practice in information design, e.g. systematic or literature reviews, books or book chapters, landmark papers. These will not relate specifically to medicines information but to information for consumers in general, where there are issues which are generic, e.g. leaflet design, print size and use of bullet points”.

A content analysis was conducted on the texts recommended by the information design key

informants to identify the key points from each of the texts which related to generic best practice in information design. One reviewer (DKR) identified the key points from each of the texts which related to generic best practice in information design. The key points from each text were extracted and inserted into a matrix, which comprised the recommended key texts on one axis and the extracted key points on the other. The use of the matrix allowed the identification of key points that were mentioned by more than one of the recommended texts, and also any differences between text authors with regard to particular key points.

The extracted key points were then used to identify and tabulate broad thematic categories and sub-themes in information design relevant to patient information leaflets. This process was conducted by one reviewer (DKR) and validated by another reviewer (DD).

Key informants identified

1. **David Dickinson**, Information Design Consultant, Consumption (also a member of the research team)
2. **Jim Hartley**, Professor of Psychology, Keele University
3. **Brian Parkinson**, graphic designer and co-organiser of Designers in Health Network
4. **David Sless**, Professor at the Communications Research Institute of Australia
5. **Karel van de Waarde**, Design Research Consultant, Belgium
6. **Pat Wright**, Professor of Psychology, Cardiff University

Synthesis methods

This review comprised five elements, each designed to contribute to the aims of the project. Initially, two members of the research team separately tabulated key findings and issues across the five evidence sources (the effectiveness review, role and value review, information and design review and the two stakeholder workshops). Similarities and differences were sought across the findings of each component and consideration given to the extent to which:

- Outcomes were related to one another, for example, is information that patients value also likely to increase knowledge?
- Outcomes might be traded off against each other, for example, detailed information is comprehensive, but patients do not value it.

- Findings across each of the outcomes were consistent across the evidence sources, for example, aspects of information design, content and provision affected outcome.
- The findings had different implications for different stakeholders (patients, health practitioners, industry, policy makers and researchers).

The similarities and differences between quantitative and qualitative findings and the extent to which these were complementary or opposed were explored.⁵⁴

A table was produced comparing the EU required information items in current manufacturers' patient information leaflets (PILs) with patients' and medicine users' views derived from the role

and value review and expressed in the stakeholder workshops (Appendix 7).

The major themes which emerged from the role and value strand about patients' views on uses and values of written medicines information were formulated for this synthesis into a set of questions (which were termed 'patient-centred processes'). The questions were discussed and agreed within the full team and then tabulated against the effectiveness trials. The effectiveness trials were grouped for this purpose by study design, to follow and match the way in which their results were presented in the report. The purpose of this analysis was to identify the extent to which the research addressed issues of concern to patients and, where this was the case, the findings.

Chapter 3

Results

Workshop one

Participants

Three different groups of stakeholders attended the first workshop: consumers, patient organisations and collaborators. The group of consumers ($N = 9$) was recruited from a city in the North of England. They were identified through the local Expert Patient Programme. Their mean age was 63 years (range: 50–77 years), five were male and all were retired. One consumer attended the workshop in the dual role of caregiver. They had personal experience of a range of medical conditions and were currently prescribed a mean of six medicines each (range: 2–11). In addition, there were four representatives from national Patient Organisations (Diabetes UK, Multiple Sclerosis Trust, Asthma UK and Arthritis Care) and four collaborators (from www.patient.co.uk, NHS Direct OnLine, ABPI and MHRA). These stakeholders, along with the 12 members of the research team, attended the workshop. As described in Chapter 2, participants were asked to respond to a number of questions posed.

Examples of good and bad medicines information

Group discussions focused largely on examples of bad medicines information. Participants brought with them examples of leaflets that were poor in terms of readability, such as ‘tiny print’ and ‘flimsy paper’ that made it difficult to read, and in terms of content, such as the use of over-technical language. In addition, the timing of the delivery of the information was raised, with complaints that it comes too late, that is, after the medicine has been prescribed. Furthermore, some participants expressed concerns that medicine received while in hospital sometimes has no leaflet at all. The amount of information provided was also discussed and it was highlighted that too much information can be overwhelming and, if it is not understandable, it may also be frightening. Some attendees noted that the leaflets can sometimes contain irrelevant information, such as contact details of pharmaceutical companies across Europe.

The most important aspects of written medicines information

Attendees again highlighted the importance of readability of the material in terms of its visual presentation, for example:

- the size of the text and its content
- providing meaningful information for the medicine user and not using ‘technical language’.

The respondents also identified that the following information was important:

- dosage and ingredients
- when and how long to take it
- likelihood of it being successful
- side-effects, such as how common or rare they are
- factors relevant to their personal medical condition (as opposed to any other condition for which the drug is taken).

The purpose (role) of medicines information

Participants indicated that a primary purpose was to provide practical information on:

- how to take the drug effectively
- its potential side-effects and interactions
- how to reduce potential harm from medicines
- how long before the medicine will have beneficial effects
- why it is necessary to finish the course
- why it was recommended not to drink alcohol.

The participants stressed that they felt the information should complement but not replace a consultation with a doctor or other medical specialist. They also indicated that the information should inform them of the purpose of the treatment in relation to their specific diagnosis, in addition what condition the drug is treating. The last theme to emerge was the feeling of some participants that the primary purpose of the information was to cover drug companies against any legal liability for things that go wrong.

What makes medicines information effective?

The emerging themes around what makes medicines information effective echoed ideas outlined above. In particular, participants highlighted the timing of delivery of the information, indicating that it would be more effective if information was available during the consultation. Issues concerned with the presentation of the information were also mentioned, in particular the need for it to be visually appealing and straightforward to read. Consumers reported they find non-technical information written in plain language ('no jargon!') to be most effective. Respondents also indicated that the content of the information was important, for example, whether it provides basic information about what the medicine contains. Finally, there was some concern about whether the information was designed for patients or professionals, with some suggestion that information aimed at the latter group may not be appropriate for patients.

What participants feel makes medicines information valuable

There was again overlap between themes generated in previous tasks. However, participants also indicated that they valued medicines information when it:

- Is presented appropriately, for example, it looks and feels important and highlights priority information.
- Permits an informed choice promoting their autonomy.
- Is reassuring and reduces concern, conflict and anxiety about whether the medicine is the right one for them.
- Gives them confidence in taking medicines.

Role and value review

Overview

Twenty-eight papers arising from 27 studies were included in the role and value review. The studies took place over a period of more than 25 years and on three continents. The nature of routinely provided written information for patients about their medicines varied over time and continent. For example, a policy of consumer medicines information (CMI) provision was introduced in Australia in the 1990s. The CMI policy was based on pharmacists printing out written medicines information for their customers, whereas European legislation requires a PIL to be inserted

into the medicine's package as the vehicle for routinely giving information. The FDA tried but was unsuccessful in legislating for package inserts in the USA. Thus what information patients receive about medicines and how they receive it differed across the world during this period.

The heterogeneity of the studies meant that they needed to be grouped in some way in order to be able to compare one with another. It was decided to use the researchers' perspective of the motivating question behind the studies as a basis for categorising them. Three main perspectives were identified:

1. A response to policy initiatives relating to written medicines information (12 studies).^{53,55-65}
2. The 'uninformed' patient and the certainty of professional knowledge and the consequent need to educate the patient (eight studies).^{49-52,66-69}
3. The 'informed, involved' patient, with recognition that professionals do not have all the answers and where patients need information in order to be able to participate in their own care (seven studies).⁷⁰⁻⁷⁶

Seventeen studies used a quantitative methodology. Predominantly these were surveys (12), which included questions about the use and usefulness of written information. Mostly questionnaires appeared to use closed questions in which research participants selected a response category from a list predetermined by the researcher. Thus participants' responses were constrained to fit the ideas of the researcher. We do not know if participants would have responded differently if they had been able to reply spontaneously using their own words. Four of the quantitative studies were laboratory based and involved reviewing and/or ranking items of information about medicines. Two studies were content analyses of medicine leaflets. One of these was clearly quantitative in its approach, but the other has been categorised as quasi-qualitative since, in addition to noting and counting items of information, the researcher also took into consideration their placing and emphasis. Nine of the studies were qualitative (see above) and one utilised mixed methods.

Eight studies, including all those that were laboratory based, did not recruit participants on the basis of being patients who were actually using the written information that was being investigated ('hypothetical' studies). Research participants who do not take the medicine related

TABLE 5 Details of role and value policy initiative studies

Ref.	Author, year, country	Method	Hypothetical
61	Miselli, 1990, Italy	Questionnaire sent to patients re leaflets for 3 OTC medicines (ibuprofen, 2 laxatives) 2 prescribed medicines (ranitidine, contraceptive pill). 6992 patients responded	No
65	Vander Stichele <i>et al.</i> , 1991, Belgium	Structured home interview using questionnaire to get a stratified sample of 400 of the general population's views on medicine leaflets	Yes
55	Bandesha, 1996, UK	Questionnaire completed in face-to-face interview with 117 older inpatients about medicine leaflets received when at home	Yes
53	Berry <i>et al.</i> , 1995, UK	Laboratory-based study with healthy volunteers given a scenario of being prescribed a medicine for a stomach problem	Yes
63	Raynor and Knapp, 2000 UK	Structured telephone interview with 196 patients who had collected medicines from 3 pharmacies	No
60	Koo <i>et al.</i> , 2002, Australia	Qualitative: 6 focus groups, 57 participants, participants of 4 groups given written information for unspecified medicine to read during group; participants of 2 groups mailed written information for one of their prescription drugs prior to group meeting	Mixed
62	Morris <i>et al.</i> , 1977, USA	Structured home interview with 2669 women taking oral contraceptives	No
77	Mazis <i>et al.</i> , 1978, USA	Same study as above	
57	De Tullio <i>et al.</i> , 1986, USA	Controlled trial to compare impact of written versus verbal information on diuretic prescribed to 285 men with hypertension	No
58	Fisher <i>et al.</i> , 1982, USA	Laboratory-based study with 265 outpatients and 151 employees to rate importance of facts about diazepam	Yes
64	Vander Stichele <i>et al.</i> , 1996, Belgium	Questionnaire sent to 1500 GPs and 500 specialists to find out their views on written medicines information (28% response rate)	Not applicable
56	Berry <i>et al.</i> , 1997 UK	Laboratory-based. 2 phases: first, 18 doctors ranked information; second, 240 people rated leaflets for medicine to treat stomach ulcer	Yes
59	Keown <i>et al.</i> , 1984, USA	Laboratory-based study to rank seriousness of various side-effects of medicines by lay people (35 students, 42 general public), pharmacists (31) and doctors (32)	Yes

to the written information or indeed who do not have a relevant medical condition are responding speculatively. Such responses may bear no relation to how they would respond when actually prescribed the medicine.

Policy initiative studies

Twelve studies (13 papers) were carried out in response to policy initiatives relating to written medicines information across three continents (Table 5). Ten studies focused on patients,^{53,55,57,58,60–63,65,77} one on health professionals⁶⁴ and two included both.^{56,59}

Study methodology

All except one of the 13 papers employed a quantitative methodology. Seven were surveys,^{55,61–65,77} one an intervention study⁵⁷ and four were laboratory-based exercises.^{53,56,58,59} Although not always explicitly reported, it seemed

that most of the questionnaires did not have any or many open questions but included response categories predetermined by the researcher. The two largest surveys included 6992 and 2669 participants.^{61,62} Even where it was reported that there were one or two open questions, it was unclear whether there was opportunity to record or follow-up spontaneous comments from the participants. It was unclear whether and how these data were subjected to systematic analysis. Miselli,⁶¹ for example, had a section for the free expression of doubts about leaflets. However, only 5% of respondents made comments and the paper gives no details about how these verbatim comments were analysed. Only Koo and colleagues' study described a qualitative method.⁶⁰

Of the seven surveys, one was 'hypothetical' (see above) in that participants were not selected because they had had recent exposure to written

medicines information.⁶⁵ Hospital patients in Bandesha's survey were questioned about written information that they had received with medicines at home. It was not clear here what medicines information patients may have had in mind when they were responding in the structured interview.⁵⁵ The four laboratory studies were hypothetical.

The qualitative study by Koo and colleagues used six focus groups with 57 participants to explore themes about written medicines information derived from the literature in relation to medicines they used.⁶⁰ In four focus groups, the participants were asked to read a medicines leaflet in the session. The remaining two groups were mailed a leaflet for one of their prescription medicines some time before the focus group took place. It was therefore unclear whether participants had in mind the specific leaflet either read in the focus group or mailed to them (which might or might not have been for a medicine they actually took), or written medicines information in general.

Findings

General view of written medicines information from a patient perspective

The **value** that lay participants placed on written information was partially assessed by researchers from the percentage of patients who said that they read it. The rates varied from study to study. There were no overt statements on what level of readership might be expected or desirable. However, the discussion section of the papers implied that some authors judged 'success' as a majority of patients reading the information. Relatively 'lower' levels were reported by Raynor and Knapp (40%)⁶³ and Bandesha (49%)⁵⁵ and high levels by Vander Stichele and colleagues (89%),⁶⁵ Koo and colleagues ('most' patients in their qualitative study)⁶⁰ and De Tullio and colleagues (82%).⁵⁷ Morris and colleagues reported high levels for a shorter insert (88%) but lower for a brochure (33%).⁶²

Raynor and Knapp asked their telephone interviewees who had received but not read the written information, on the specific occasion under investigation, why they had not done so.⁶³ Most replied that it was not necessary as they had read the information in the past. Amongst those receiving the medicine for the first time, nearly three-quarters had read it. In the studies reporting high readership levels, patients were specifically asked if they had 'ever' read the information. Morris and colleagues found that

among the 88% who read information on oral contraceptives inserted in the package, this was predominantly (78%) at the time of the first prescription, and less than 11% read it for subsequent prescriptions.⁶² Hence the difference in levels of readership between Raynor and colleagues' study and those finding high levels appears to be a result of whether the question elicited a response to readership relative to new or familiar medicines. Bandesha calculated and reported the readership level in relation to all 117 patients interviewed.⁵⁵ However, 26 said they had not received a medicine leaflet with their medicines at home. If the percentage is recalculated to relate only to those receiving the information, then 63% had read the leaflet. With these adjustments, all of the studies which looked at readership levels found most patients read a leaflet at some point (if not a brochure). Reasonably, patients do not necessarily read the same leaflet over and over again with each repeat prescription but may keep it for future reference.

Whereas three of the authors referred to patients' desire for concise leaflets,^{60,61,65} six of the eight studies that reported on patients' preferred amount of information found that most patients wanted detailed explanations and, when given a choice, more rather than less information.^{53,58,59,61,62,65} The more detailed information needed to be relevant to be valued by patients.⁵³ The two exceptions were the studies of Bandesha⁵⁵ and Koo and colleagues.⁶⁰ Bandesha reported that of the 117 patients interviewed, 34 had seen but not read a leaflet.⁵⁵ Twelve of these said they had been put off reading it because there was too much information. Only one patient in Raynor and Knapp's study gave difficulty in understanding a leaflet as a reason for not reading it.⁶³ In Bandesha's study, none of the 57 patients who had read a leaflet referred to it as being too long or giving too much information.⁵⁵ Koo and colleagues state that most focus group members thought leaflets were too long and, as with Bandesha, the authors conclude that patients would be more likely to read a concise leaflet than a long one. (In Australia, where Koo and colleagues' study took place, the routine written information handed out by pharmacists is longer than medicine package inserts in Europe.) Koo and colleagues did not include any quotations from their research participants to substantiate this point. However, there was one which suggested that if participants had previously had a problem with a medicine, then more detailed information was needed.⁶⁰

“I think it’s like any area. If you’ve got a car that plays up, you get to know all the different things about that – if you don’t have a car that plays up you don’t worry” (respondent in Koo and colleagues study⁶⁰).

More detailed information would, of course, necessitate a longer leaflet.

The tension between conciseness and detail in written information was made evident in Vander Stichele and colleagues’ comment that, *“Comprehensiveness and conciseness will have to form a never-optimal compromise.”*⁶⁵ Patients in Vander Stichele and colleagues’ Belgian study were asked about their preferences for length and completeness in a new leaflet in two separate questions.⁶⁵ Some 67% asked for a short leaflet, yet 88% wanted it to be exhaustive. This was a hypothetical study – patients were not necessarily taking the medicine to which the leaflet related, so their responses are conjecture. The leaflets that the Belgian participants were receiving at the time of the study were technical transcripts of data sheets written for doctors and pharmacists rather than PILs, so it is inappropriate to compare them with the leaflets of other studies. Although the two issues of methodology and type of written information increase uncertainty about the interpretation of Vander Stichele and colleagues’ finding, they do raise the question of what patients mean by short and comprehensive in relation to written information.⁶⁵

Role of written medicines information from a lay perspective

Three of the 12 policy initiative-related studies contained data on the role of written medicines information. The findings were reported as motives for reading a leaflet. Vander Stichele and colleagues⁶⁵ found that these included:

- deciding whether or not to take a medicine
- to know more about it
- for reassurance
- to be able to comply with therapy.

These categories were predetermined by the researchers.

Koo and colleagues’ qualitative study found that their respondents read the medicines information leaflet:⁶⁰

- if they took responsibility for their own care rather than simply entrusting care to health professionals
- if the medicine was prescribed for a serious condition such as glaucoma rather than

something less serious such as a common infection

- to learn about side-effects
- if a respondent had encountered a problem with a medicine in the past
- if they were in a caregiver role and administering the medicine to a child for example
- to learn how to take the medicine properly.

Koo and colleagues’ findings appear to relate to Vander Stichele and colleagues’ categories. The women in Morris and colleagues’ study suggested some additional ways in which women found information useful: finding out what to do if they missed taking an oral contraceptive pill and as a reference if they could not contact a physician to discuss their concerns directly.⁶² The brochure rather than the briefer insert was more likely to be retained for reference.

Lay views on the content of written information

Nine of the 12 studies looked at what information patients read and/or what they would select to include in a leaflet from a professionally derived list of items of information.^{53,55,56,58–62,65}

Information on:

- side-effects
- contraindications
- how to take the medicine and
- its purpose

were common choices either as to what was actually read or what patients felt they would most like to know about. However, Berry and colleagues suggest that patients’ queries about medicines may be broader than these categories.⁵³ In a hypothetical laboratory-based study, Berry and colleagues asked participants what questions they would like to ask the doctor after they have been prescribed a medicine. The framing of this question is wider than those posed in the other studies and is asked in terms of spoken rather than written information.

Berry and colleagues⁵³ found that lay participants had additional questions about:

- the condition for which the medicine was prescribed
- how the medicine works
- alternative treatments
- the risks of not taking it.

Although information on the risks of taking a medicine was accorded the highest priority by

patients across the 10 studies, some said there was a downside to reading about the potential adverse consequences of a medicine. Such information may cause anxiety.

“It doesn’t make you feel very good I’m afraid because you are thinking, ‘I’m damned if I do take [the medication], I’m damned if I don’t’” (respondent in Koo and colleagues’ study).⁶⁰

Others were not worried about what they read on possible side-effects. One respondent distinguished between information raising awareness of potential adverse effects of a medicine and causing inhibition to taking the medicine.

“I think it [written information] makes you aware, not so much put off as aware” (respondent in Koo and colleagues’ study).⁶⁰

De Tullio and colleagues found that while including information on side-effects increased the reporting of side-effects by patients (perhaps because they were then recognised as such), it did not result in increased anxiety.⁵⁷ Thus the findings suggest that the relationships between reading about the risks of a medicine and experiencing anxiety, and between experiencing anxiety and being put off taking a medicine, were complex.

Morris and colleagues’ investigation into written information about oral contraceptives throws some light on both issues of whether patients wanted and valued concise or detailed information and their attitudes towards inclusion of information on risk.⁶² As previously mentioned, Morris and colleagues found that most of the women receiving the package insert on oral contraceptives read it, particularly on the first occasion the medicine was prescribed. Those who received a longer brochure were significantly less likely to read it. Paradoxically, when asked how satisfied they were with the two types of information (all women were asked to read the brochure during the course of the interview), the women thought there was insufficient information in the package insert about side-effects, contraindications and drug interactions. Women were more satisfied with the depth of explanation in the brochure, although a sizable minority still wanted additional information. Whether patients value detailed or concise information depends on the context in which it is read and the purpose of reading it. A long, detailed leaflet could reduce motivation to read.

“... it [written material] doesn’t make you want to read it.” (respondent in Koo and colleagues’ study).⁶⁰

However, where patients want to read the leaflet to find an answer to a specific query then there has to be sufficient detail to answer that question if the leaflet is to be useful. A leaflet on ranitidine was deliberately kept short in Miselli’s study and participants viewed its conciseness as a denial of information.⁶¹

Professional evaluation of leaflets

Only one study focused on health professionals’ views of written medicines information,⁶⁴ although three others had something to say about this.^{56,58,59} In Vander Stichele and colleagues’ study, 543 questionnaires from GPs and specialists in Belgium (28% response rate) demonstrated a range of attitudes towards written medicines information which patients received.⁶⁴ (At that time in Belgium these were technical documents intended for health professionals rather than information written for patients.) According to their responses, Vander Stichele and colleagues identified three clusters. Some 20% of doctors were moderately positive about the provision of written medicines information with each medicine. These doctors tended to be younger and to see written information as a substitute for oral information. In total, 44% were grouped as ‘ambiguous to neutral’. They were inclined to write out information for patients in addition to the prepared material and to view this material as too long with too much risk information, which could have a deleterious emotional impact on patients. However, they still said they would discuss the prepared information with patients. The remaining 36% of doctors were classified as overtly negative. They blocked patient access to the written material in some circumstances and thought that it led to non-compliance and made prescribing of medicines with a high incidence of side-effects difficult. Like the previous group, they would independently write information for their patients. The very low response rate in the study raises questions about the representativeness of these views and the robustness of the authors’ ‘clusters’.

In Fisher and colleagues’ study, lay people ranked items of information about a benzodiazepine (diazepam) which had previously been determined by experts as important to include in written information about diazepam.⁵⁸ One group of participants was recruited from an outpatient pharmacy and a second from amongst employees in an insurance company. Some 54% of outpatients and 55% of employees had previously used diazepam. Although there was generally a high level of agreement between lay and expert

participants, lay participants ranked additional items on the risks of taking diazepam which had not been included in the leaflet more highly than health professionals did. An important limitation of this study is that even those items that were not included in the leaflet were generated by professionals. There may be other information that patients wanted to know.

Berry and colleagues found less agreement than Fisher and colleagues between what patients wanted to know and what their doctor wanted to tell them about drugs to treat stomach ulcers.⁵⁶ Doctors were asked to rate a list of 16 items of information about a prescription drug for importance to include in written information about the drug. Patients had identified the 16 items as what they wanted to know about a medicine in an earlier study by Berry and colleagues.⁵³ When the rankings of doctors and patients were compared, there were differences. Side-effects were ranked number one by patients but equal tenth by doctors. Doctors thought it more important to give information on drug interactions and the risks of not taking the medicine. Keown and colleagues also found that health professionals were more resistant than lay participants to the listing of side-effects in a leaflet and tended to favour only partial disclosure.⁵⁹ All three studies were laboratory based. Berry and colleagues discussed the limitation of such a research design, where healthy volunteers are only imagining what they would like to know, which may be very different from 'real' patients actually suffering from the condition and when a medicine has actually been prescribed.

It seems, therefore, that patients and professionals had different priorities and preferences.

Professionals wanted to restrict the amount of adverse information about a medicine, fearing that it could lead to patient anxiety and non-compliance. Most patients wanted detailed information on adverse effects even if it did make them anxious.

Relationship between verbal and written information

Written material is, of course, not the only form of communication about medicines information. The point at which a medicine is prescribed and dispensed is an opportunity for face-to-face communication between health professional and patient. One reason why patients said they did not read the medicine's leaflet was because they had received spoken advice from their doctor and/or they trusted their doctor.^{60,62,63} The issue of

patients leaving the doctor or pharmacist in charge of information giving was only followed up in Koo and colleagues' study, where the authors saw it as an indication of patients' external locus of control.⁶⁰ No study explored trust between doctor and patient in the context of medicines information provision.

The design of De Tullio and colleagues' study should have enabled the significance of the interplay between the physician's advice and written information to be elucidated.⁵⁷ The study involved a telephone interview with patients taking a diuretic. There were four groups, three of which received written information about the diuretic:

1. Group 1 received a leaflet at the pharmacy window when collecting the diuretic.
2. Group 2 received a leaflet from their physician but no verbal information.
3. Group 3 received a leaflet from the physician and were also verbally counselled. The verbal counselling was the same as that which took place in what the authors refer to as a 'standard consultation'. In a standard consultation, verbal advice included four items of information: the name of the drug, indication, when to take it and an instruction to reduce salt intake (all of which were also included in the leaflet). There was no verbal information on side-effects.
4. Group 4 was a control group and did not receive a leaflet but presumably would have received the standard verbal advice (although this is not specified in the paper). All the authors say about the control group is that they received no special information about their diuretic.

De Tullio and colleagues⁵⁷ were surprised to find that group 3 thought they received more information about side-effects than groups 1 or 2. They concluded that when patients are given written and oral advice by their doctor they view their doctor as being the source of all information even if some of it was only in the leaflet. They were also surprised to find that in knowledge tests, group 2 scored higher than group 3. Their suggested explanation for this was that as the test questions were based on the leaflet and not on the doctor's verbal advice, patients in group 3 who got both verbal and written information placed a higher value on the doctor's advice and paid less attention to the leaflet. A limitation of this study is that the process aspects of the consultation were not explored with either doctors or patients. For example, although doctors were asked to provide

TABLE 6 Details of uninformed patient and certainty of medical knowledge studies

Ref.	Author, year, country	Method	Hypothetical
67	Dodds and King, 1989, UK	Survey questionnaire about leaflet for antibiotic (11 questions – only first 7 reported on in this paper)	No
49	Blom and Rens, 1989, The Netherlands	Observation in pharmacy of 80 patients buying OTCs followed by structured home interview to investigate information needs re OTC	No
69	Mottram and Reed, 1997, UK	Questionnaire completed in face-to-face interview with 80 members of general public in a shopping centre, self-completed by 48 pharmacists and 66 GPs about medicine leaflets in general	Yes
68	Jazieh and Brown, 1999, USA	Leaflet on chemotherapy developed by means of focus groups with cancer patients and evaluated by means of telephone interview between pharmacist and 85 patients	No
50	Thompson and Stewart, 2001, Australia	Structured home interview and medication assessment with 204 older people to find out experience/views of getting medicines information written and verbal	Yes
51	Hughes <i>et al.</i> , 2002, UK	10 qualitative interviews and 4 focus groups with patients to find out their knowledge/perceptions of side-effects of OTC medication	Mixed
52	Ross <i>et al.</i> , 2004, USA	Mixed. Focus groups and interviews with patients to develop written information for contraceptive pill. Questionnaire to staff to get views on the leaflet developed	No
66	Buchbinder <i>et al.</i> , 2001, Australia	Content analysis of written information on medicines to treat arthritis (more than 91 items) for patients	Not applicable

only the ‘standard consultation’ items, other information may have been provided, either spontaneously or in response to patients’ questions. The doctors seeing group 2 patients were asked to give no verbal information about the medicine; there is no way of knowing whether this is actually what happened. Also, there is no information about whether patients asked questions during the consultation and what information, if any, they were given in response.

Despite the above findings, which hint at a complex relationship between what the doctor says and written information handed out by the doctor, De Tullio and colleagues concluded that a leaflet can be an ‘effective educational tool’ as a stand-alone without supporting oral advice.⁵⁷ Indeed, their research question was, ‘Does a verbal consult enhance the effects of a medicine information leaflet?’, rather than vice versa. The respondents in Koo and colleagues’ study desired face-to-face discussion with a doctor or pharmacist about the content of written medicines information, although they did not often get this.⁶⁰ De Tullio and colleagues suggest that **if** the prescriber gives verbal information, then the written and spoken should reinforce each other as patients attach greater importance to the word of the doctor than to the content of the leaflet.⁵⁷ The implication of this is that where oral and written information

deliver different messages the patient will believe the doctor, which is what was found by Vander Stichele and colleagues.⁶⁵ In the latter study, only 2% of people said they would follow the instructions in written information rather than what the doctor said in the case of conflicting advice. Unfortunately, the very limited information expected to be given by the prescriber in the 1980s ‘standard consultation’, and the unknown and unexplored patient experience of receiving a leaflet from a health professional who says nothing in support, restrict understanding of the meaning of De Tullio and colleagues’ findings.⁵⁷ Nevertheless, they point to the importance of examining the role, value and effectiveness of written medicines information within the broader context of the relationship and information exchange between prescriber and patient, and not simply considering written information in isolation.

The uninformed patient and certainty of medical knowledge

Eight studies were set within this context, often around compliance and the assumption that if patients were better informed about their medicines then they would be more likely to take them as prescribed or in the case of OTC medicines to use them effectively⁵⁰ (Table 6). Six of the studies were concerned with patients’ views of

written medicines information,^{49–51,67–69} and one of these also included a professional perspective.⁶⁹ One concerned the development of a leaflet⁵² and one an expert assessment of existing leaflets for a medicine.⁶⁶

Study methodology

Six of the eight studies used a quantitative methodology,^{49,50,66–69} one a qualitative methodology⁵¹ and one used mixed methods.⁵² In the two studies which stated that they used semi-structured interviews or focus groups,^{51,52} there were suggestions that the study methods were not fully qualitative. The role of the interviewer appeared quite directive. For example, in the focus groups in Ross and colleagues' study, to obtain formative feedback on current written information about oral contraceptives members were asked if they understood specific medical terms in each section.⁵² In the semi-structured interviews (described as cognitive), women had to explain the meaning of items of information. In the other direction, Thompson and Stewart's study,⁵⁰ which used a structured interview and was analysed statistically, had a lot of qualitative data in the findings, which came from additional comments that were recorded verbatim. However, the way in which these data were recorded and analysed is not described.

Five of the six studies that used quantitative methods employed questionnaires (either postal or completed in a face-to-face interview).^{49,50,67–69} Only Dodds and King's paper included the questionnaire.⁶⁷ It is hard to know how much confidence to place in the overall assertions without some knowledge of what the questionnaires were like and how they were used. For example, Dodds and King make claims for how different sections of the population evaluated a leaflet on antibiotics based on an age/sex analysis of replies to two questions. In one question, participants were asked to tick boxes to indicate whether they found the leaflet interesting, boring, easy to understand, surprising, worrying and so on. However without further elaboration of the responses, we do not know what participants meant by interesting, boring and so on.

There was evidence in two studies that the type of questioning affected participants' replies and could apparently provoke an information need.^{49,50} In both studies the researchers started with open questions about desired information about a drug followed by a prompt sheet regarding specific points of information. The researchers found that before being given the

prompts, participants started with low information needs. However, after being prompted by the researcher, nearly all expressed a need to know about an increased range of drug information.

In two of the studies participants were not taking the medicine of the leaflet under review.^{50,69} In a third, while the interviewees were selected because of purchase of two specific OTC medicines,⁵¹ the focus group participants were recruited through a school and only needed to have bought any OTC medicine in the previous 6 months. Leaflets related to a wide range of medicines: OTCs,^{49,51} antibiotics,^{50,67} chemotherapy,⁶⁸ oral contraceptives,⁵² drugs used in rheumatology⁶⁶ and an unspecified medicine.⁶⁹

Findings

General view of written medicines information from a patient perspective

Among 60% of participants who received written information on OTC medicines, two-thirds did not read it,⁴⁹ whereas with a chemotherapy leaflet handed out in hospital to those newly diagnosed with lung cancer, 82 out of 85 questioned had read it.⁶⁸ Lay people may assume that only low-risk products are allowed to be sold OTC.⁵¹ This suggests that patients evaluate the potency of medicine and may not see a need to read about 'weak' medicines. Chemotherapy, on the other hand, is prescribed by specialists for a potentially life-threatening condition. Consequently, patients may be more concerned and motivated to read the accompanying information. The reasons given by Blom and Rens⁴⁹ and Hughes and colleagues⁵¹ research participants for not reading a medicine leaflet were that they had used the drug before, the drug was purchased for someone else or that they had read it previously.

"The first time I buy anything new I do read it, and then after that, well, just trust to luck I think!" (respondent in Hughes and colleagues' study).⁵¹

The main reasons for reading the leaflet with the OTC medicine were to find out how to take the medicine and about any possible side-effects.

Most of these studies reported that patients were positive about the written information that they received, although Dodds and King state that attitudes towards information about antibiotics were not uniform across society, with younger people and women valuing leaflets more than males or older people.⁶⁷ Dodds and King's finding about older people being less receptive to written information was endorsed in Thompson and Stewart's study,⁵⁰ where those aged 65–74 years

were more likely to say they would find written information helpful than those aged over 74 years. Some research participants had concerns about written information. These centred on the listing of side-effects which could cause patients to worry.

“A little ignorance [about side-effects] doesn’t hurt. I don’t want to know. It makes you worry excessively”
(respondent in Thompson and Stewart’s study).⁵⁰

In Hughes and colleagues’ study, the patients thought that other people (although not themselves), if provided with a list of side-effects in a leaflet, might believe they were experiencing them.⁵¹ Hughes and colleagues supplied additional information about the study for the review, which included the background of some members of the focus groups. Three out of the four focus groups contained participants who were either health professionals or married to a health professional. No information was given about the occupations of members of the fourth group. Thus focus group participants’ complaints about the long list of side-effects in written medicines information and the potential impact on patients come from both a professional and a lay perspective.

Role of written medicines information from a lay perspective

There was a brief exploration of the role of written medicines information in two studies.^{50,51} The other studies included assumptions about role – sometimes open, sometimes tacit – from a professional perspective. Thus Ross and colleagues speak of written information on oral contraceptives as having a role in their safe and effective use,⁵² specifically in advising women about what to do if they miss taking a pill. However, some women wanted more information on side-effects than appeared in the simplified leaflet which was developed as a result of the study. This suggests that some women at least were interested in written information for purposes other than ‘how to take the medicine’. Jazieh and Brown emphasised a need for simple and concise information at an appropriate reading level for their patients undergoing chemotherapy,⁶⁸ of whom three-quarters had not stayed on at school. Written material should, however, also contain reference information such as who patients should call if a serious side-effect was experienced. Jazieh and Brown’s results showed that patients did value such reference information. However, the authors do not appear to have fully appreciated the significance of their data in that patients had also used the leaflet in more sophisticated ways, yet the authors make no comment on it. Thirteen out of 18 patients who had called the hospital said that

the written information helped them to decide to make the call, that is, it had helped them to decide that their response to chemotherapy was potentially of clinical concern. Two patients who had some experience that might have led to their contacting the hospital decided not to on the basis of the written information. Hence the information pack assisted with patients’ decisions about their care when at home and authorisation of actions they decided to take. In addition, they also used the leaflet to help explain chemotherapy to their families.

Three of the respondents in Hughes and colleagues’ study said they had checked the OTC leaflet for specific information, although the paper does not report what specific information was looked for.⁵¹ One interviewee had done so because he thought that the OTC medicine was ‘strong’ rather than something like a cold remedy. Focus group participants mentioned that a leaflet would be read where side-effects had been experienced in the past, or where the medicine was for a child. One criticism made of leaflets in the focus groups was that information about children’s dosing was confusing. Dosage instructions were related to age and parents recognised that there was a poor correlation between a child’s age and weight. They wanted dosage in relation to weight. Thompson and Stewart’s participants (older people) said that written information could help with recognising adverse effects and remembering what a health professional had said about a medicine, particularly where a patient had hearing problems.⁵⁰

Professional evaluation of leaflets

Three studies throw some light on health professionals’ evaluation of leaflets.^{52,66,69} Just under half of the rheumatologists in Australia who replied to an invitation by Buchbinder and colleagues to send written material that they routinely gave to their patients on medicines (84 of 195 doctors contacted) said they did not provide such materials.⁶⁶ Buchbinder and colleagues were concerned about the quality of written information on medicines that was handed out. Most of the leaflets (88) provided by the rheumatologists were produced in-house (either by individual doctors or by hospital departments) and 20 were professionally recognised patient guides. The lists of side-effects varied widely between documents and used medical jargon. In describing the side-effects, the underlying cause rather than the symptom was given, for example decreased blood counts rather than bleeding, sore throat or tiredness.

Mottram and Reed asked pharmacists, doctors and the general public to evaluate written medicines information in what was described as a sample leaflet.⁶⁹ However, the paper does not say which medicine the leaflet related to and the same questions were not asked of all three groups. Just over 80% of GPs and pharmacists thought that leaflets were useful or very useful. In keeping with other findings reviewed in this report,⁶⁹ GPs rated the need to include information on side-effects as much less important than did pharmacists or members of the public. When asked to estimate readership, the pharmacists were more pessimistic than the general public about the percentage of patients who read leaflets. GPs were not asked this question. A question asked of pharmacists and GPs but not of the general public concerned groups of patients for whom it might be inappropriate to give written information. A range of groups was identified. More than one-quarter of pharmacists and 15% of GPs mentioned patients with psychiatric disorders as possibly unsuitable. Almost as many pharmacists but only two doctors thought the same about patients suffering from cancer or other terminal illness.

Ross and colleagues⁵² conclude that the revised leaflet for oral contraceptives developed as a result of their study was seen as a valuable tool by family planning staff. The results, however, do not appear to be so clear cut when it comes to considering if and how the leaflet would be actually used. There was a response rate of 61% (18 respondents) to the staff survey. Half said that the new leaflet was easy to read and understand but less than one-quarter said they would use it as a reference source with patients. Unfortunately, there are no qualitative data to unpick what seems on the face of it to be some ambivalence by professionals towards the leaflet. These findings suggest that underlying a globally positive assessment of the value of written information, professionals may have more complex and equivocal views.

Relationship between spoken and written information

Only one study looked at this issue. Respondents (older people) in Thompson and Stewart's study said that GPs were their main source of information about prescription drugs.⁵⁰ The main reason given by nearly one-quarter of older people in their sample as to why they thought leaflets were not particularly useful was that the same information could be given by the GP. A few of these considered that to ask for a leaflet would be to show lack of faith in their GP in the same

way as asking questions could seem to question a doctor's expertise. Several were content to leave the GP in charge of information giving because they trusted the doctor.

*"She [GP] doesn't seem to give me much information. She just tells me to take them. I just do what the doctor tells me and that's it. I've got such faith in her you see."*⁵⁰
(respondent in Thompson and Stewart's study).

Some respondents were concerned that written information might be used to replace oral information and that leaflets without verbal explanation could cause patients to become anxious. However, a conflict between oral and written advice could also be a cause for concern.

The limited data suggest that when patients are evaluating the role and value of information about illness and treatment, the content of information is tied up with the context in which communication occurs and the quality of the relationship between patient and professional. Spoken information, however limited, is valued as an expression of the relationship between patient and doctor. Patients would not want written information to be a substitute for oral information.

The informed, involved patient – professionals do not have all the answers

Seven studies were set in the context of patients as active participants, or even partners in healthcare, who took rational decisions based on their own understanding, experiences and priorities, which might not accord with those of health professionals (Table 7). An important role of information was equipping patients to be involved in their own care. This position stands in marked contrast to the professionally oriented educational discourse seen in the studies reviewed in the previous section.

Methodology

All but one of the studies used a qualitative methodology.⁷³ Herxheimer's study⁷³ was a content analysis of medicine leaflets. Herxheimer looked not only for the presence of three specific points but also the emphasis and placing of the points in order to evaluate the clarity of an information message, rather than simply its technical correctness. Four studies used focus groups,^{71,74–76} and two semi-structured interviews.^{70,72} In three of the studies, there was also a content analysis of written information.^{70–72}

In Nair and colleagues' study, people were selected in order to obtain a sample that represented the cultural and demographic

TABLE 7 Details of informed, involved patient studies

Ref.	Author, year, country	Method	Hypothetical
73	Herxheimer, 1999, UK	Content analysis of all leaflets on NSAIDs printed in 1998–9	Not applicable
71	Coulter <i>et al.</i> , 1999, UK	10 focus groups (62 patients) reviewed written materials (not all medicines) relating to range of medical problems. Clinical specialists reviewed materials independently using a structured check list	No
74	Nair <i>et al.</i> , 2002, Canada	19 focus groups (88 patients, 27 doctors, 35 pharmacists) to find out information needs regarding medicines to treat sore throat, gastro-oesophageal reflux and osteoporosis	Yes
76	Raynor <i>et al.</i> , 2004, UK	4 focus groups (23 patients with asthma) to find out information needs regarding medicines	No
75	Pollock <i>et al.</i> , 2004, UK	14 focus groups (88 respondents) made up of psychiatric patients/carers, psychiatrists, psychologists, nurses, occupational therapists, managers to find out about information needs regarding medicines	No
70	Cedraschi <i>et al.</i> , 2000, Switzerland	Semi-structured interviews with 76 patients with chronic pain and 54 controls, to investigate kinds of information on medicines they looked for and its impact. Content analysis of 16 antidepressant leaflets	Mixed
72	Grime and Pollock, 2004, UK	Semi-structured interviews with 30 members of depression self-help group, which included experience of antidepressant drugs. Content analysis of antidepressant leaflet	No

diversity of the Canadian cities where the research was carried out.⁷⁴ Participants did not necessarily have any (recent) experience of the illnesses (sore throat, gastro-oesophageal reflux disease, osteoporosis) that related to the medicines information sheets they reviewed. In all of the other five focus group or interview-based studies the respondents suffered from the relevant illness and/or had taken the medicine of the leaflet in question. In addition to a group of patients chosen because they suffered from chronic pain, Cedraschi and colleagues also interviewed a control group of non-patients who were matched for age, sex and education.⁷⁰ This study was unique in that it is the only one which offered the opportunity to compare responses between actual and 'hypothetical' patients.

The intention of semi-structured interviews and focus groups is to encourage the respondents to dwell on what is important to them. In this context it is interesting that the researchers in Raynor and colleagues' study found it difficult to persuade the focus group members to discuss written information at all.⁷⁶ The patients were more concerned to talk about other aspects of treatment and their condition. Questionnaires and structured interview methods, which dominated the previous sections of role and value findings, tend to reflect the perspective and priorities of the researcher, particularly where they have no

qualitative component. A consequence of the qualitative methods employed in the seven studies in this section is that the findings cannot be easily accommodated within the headings used in previous sections.

When presenting the findings, quotations that appeared in the papers are used to support points being made. However, in three of the papers that taped interviews and focus groups,^{71,72,76} quotations were not given, either because of publishers' restrictions on word length or at the request of the organisation hosting the research. Hence the quotations come from three papers,^{70,74,76} and predominantly from Raynor and colleagues' paper⁷⁶ as the other two used only a few quotations.

Findings

Experiences of getting treatment information

A range of experience was reported. Three studies found that patients were dissatisfied with their experience of communicating with health professionals in that they felt that they had not been told enough and were unaware of treatment options.^{71,74,75} The people with asthma in Raynor and colleagues' study reported an equal mix of positive and negative experiences.⁷⁶ Respondents' negative experiences were similar across all four studies and included not being given sufficient verbal information to understand why a medicine had been prescribed.

“I just had to take this inhaler. I didn’t know – All I know is that they said I’d had asthma but they didn’t tell me anything at all. I didn’t get no information, it is only what I have read over the years and listened to people trying to understand it” (woman aged 63 years in Raynor and colleagues’ study).⁷⁶

Some patients found it difficult to obtain specific information from their doctor about a medicine.

“I find that unless I ask the questions to my doctor, that she doesn’t always come out and tell me – and after there had been some side effects that I would have thought she would have automatically told me about ...” (respondent in Nair and colleagues’ study).⁷⁴

In addition, sometimes when verbal information was given it was confusing, perhaps intentionally so.

“So, I asked about that, the Becloforte. I said, ‘Is it steroid-based?’, and he [doctor] said, ‘No’. So, I went back and I asked him again and he said, ‘Well the little bit of steroid that is in it will go straight into your system, it won’t cause your weight [problem]’” (woman aged 66 years in Raynor and colleagues’ study).⁷⁶

Thus some patients were suspicious that on occasions professionals would withhold information and, in the case of the woman above, those suspicions were confirmed.

Pollock and colleagues’ study arose because of repeated complaints by psychiatric inpatients that they were not given sufficient information about their medicines.⁷⁵ In relatively closed institutional settings, patients find it particularly difficult to access information and making good-quality information available is particularly important, especially when the medicines involved are potent. The focus group discussion interwove consideration of information, treatment and the condition for which it was prescribed, that is, for patients, treatment information was inseparable from information about diagnosis and illness. This is in stark contrast to the narrow focus on medicines information characteristic of studies informed by the professional perspective.

What patients want to know about medicines

The studies by Raynor and colleagues,⁷⁶ Nair and colleagues,⁷⁴ and Pollock and colleagues,⁷⁵ produced a similar list of things that patients want to know about their medicine:

- Diagnosis/is this the right treatment for me? (Raynor, Nair, Pollock).^{74–76}
- Name of medicine (Raynor, Pollock).^{75,76}
- When and how to take the medicine/dosage (Raynor, Pollock).^{75,76}

- Purpose of medicine (Raynor, Pollock).^{75,76}
- Intended therapeutic effects (Pollock).⁷⁵
- All side-effects with a likelihood of their occurrence (Raynor, Nair, Pollock).^{74–76}
- What to do about side-effects (Raynor).⁷⁶
- Long-term effects and risk of damage (Raynor, Nair, Pollock).^{74–76}
- What it feels like to take the drug (Pollock).⁷⁵
- How long the drug was likely to be prescribed (Nair, Pollock).^{74,75}
- Interactions with other medicines (Nair, Raynor).^{74,76}
- Other forms of treatment for the condition – both drug and non-drug (Nair, Pollock).^{74,75}
- The consequences of not taking the medicine (Pollock).⁷⁵

Cedraschi and colleagues found a difference in their respondents’ replies depending on whether they were real or hypothetical patients.⁷⁰ Patients who were actually suffering from chronic pain found it harder to specify the ideal information they would expect to get before taking a medicine as opposed to the information they had received. Although side-effects were a concern for both groups, significantly fewer real patients compared with non-patients put information on side-effects or contraindications in ideal information. This finding is surprising as in all the other studies reviewed side-effects were at the top of the list of what patients wanted to know. Cedraschi and colleagues suggest that one explanation is that the patients assumed that the ideal information was not to replace the actual information they had already received but to supplement it. This example highlights the problems with taking responses at face value without considering the context.

These qualitative studies revealed the desire of patients to have information that was tailored to them and their condition. Nair and colleagues report that patients wanted to know that the treatment was suited to their personal health circumstances,⁷⁴ and Raynor and colleagues’ focus group members recognised the individual nature of people’s responses to medicines.⁷⁶

“Everybody’s different, everybody’s individual. You can’t say, ‘We’re all asthmatics, the same thing works’. The same thing won’t work. A different inhaler works for you, won’t for me” (54-year-old man in Raynor and colleagues’ study).⁷⁶

This presents a problem in relation to leaflets that are inserted into medicines’ packages, since the focus is on the medicine and not the patient. In addition, a particular difficulty stemming from the

separation of drug and illness information is where a package insert is for a medicine whose main indication is not the health problem for which it has been prescribed and may not actually be licensed. For example, in Cedraschi and colleagues' study in Switzerland, 25 patients were prescribed antidepressants for chronic pain.⁷⁰ Only five out of a possible 16 Swiss antidepressants were licensed for this purpose and therefore mentioned pain as an indication. One patient initially responded to a question about whether he had ever taken an antidepressant by saying no, and then added:

“Well, yes I was prescribed something, but when I read the leaflet I saw it was an antidepressant – I immediately stopped taking it because I'm not crazy” (41-year-old man with chronic back pain in Cedraschi and colleagues' study).⁷⁰

This man never told his doctor that he had stopped taking the antidepressant. Many of Nair and colleagues' focus group members felt they did not have a clear understanding of their diagnosis.⁷⁴ They valued written information which said enough about the condition it was prescribed for to reassure them that the medicine was relevant to them. Written information may become particularly relevant to patients who become distrustful of healthcare professionals, as a result of some prior difficulty or dissatisfaction with their care, to check they have been prescribed an appropriate medicine.

There was no reference in the findings from any of these seven studies to patients' desire for short and simple leaflets. Coulter and colleagues talk of the fine balance between providing too much and too little information.⁷¹ Their focus group members thought that many of the leaflets that they reviewed (some were both condition- and medicine-based) were too basic to be helpful. One or two were too technical. They also found that many leaflets did not admit to scientific uncertainty. Some of the leaflets contained assertions not supported by references to primary sources, and the leaflets rarely discussed the strength of the research evidence.

Use of written information from a patient perspective

Nair and colleagues found that side-effects and risk information (drug interaction and contraindications)⁷⁴ were mentioned by all 11 focus groups and for most groups it was the first topic mentioned when considering what information respondents wanted about medicines. Nair and colleagues said that respondents believed

that having this information would help them to decide whether or not to take a medicine should it be prescribed. Two other studies also referred to information on side-effects being used to weigh up the advantages and disadvantages of a medicine.^{70,75} In these two studies, unlike that of Nair and colleagues, the participants were actual patients. It appears that real patients were not talking so much in terms of using the information on side-effects to take a unilateral decision as to whether or not to take the drug, but more that the information could help them to participate in decision-making.

“One patient indicated that he would like to have the opportunity to call the doctor ‘to check whether the side-effects are normal or not, and also if the medicine might be contraindicated in my case because when you read the leaflet you start to wonder ...’” (43-year-old patient with chronic low back pain in Cedraschi and colleagues' study).⁷⁰

Some of the psychiatric inpatients in Pollock and colleagues' study wanted to know about risks and side-effects so that they could decide if the drug was going to be suitable for them when they left hospital and resumed work and family duties.⁷⁵ At least one-third of those with depression in Grime and Pollock's study had a sufficiently bad experience of side-effects to question whether to continue with or change their antidepressant.⁷² Psychological side-effects such as emotional flatness or those that mimicked the depression symptoms such as insomnia were judged to be most troublesome. The leaflet on antidepressants, written for a national self-help group to which the respondents belonged, rather downplayed side-effects and did not recognise the significance of psychological as opposed to physical consequences of taking the medicine.

Written information not only influenced respondents' decisions to start or continue taking a medicine, it was also needed to prepare patients for what they might experience in response to a drug. Information could be reassuring and help patients to use medicines safely, for example by knowing if it was safe to combine prescribed and OTC medicines.⁷⁵ It could also help build good relationships with health professionals. Health professionals giving medicine leaflets to a patient said that information about drugs was an appropriate and legitimate topic to raise with professionals,⁷⁵ and written information could suggest questions that patients might want to ask.⁷¹ Ideas for self-help could assist patients to take responsibility for their own care and recovery.^{71,72}

Relationship between verbal and written information

Medicine leaflets were the most common source of information in three studies^{70,74,75} (although not easily accessible in hospital in the case of Pollock and colleagues' study).⁷⁵ It appears, however, that written information was not the information of choice. Many patients primarily wanted to talk with their doctor and felt that written information had a subsidiary role and should not replace oral information. Some information such as how to use an inhaler could be very difficult to portray in written form. It will be recalled that Raynor and colleagues⁷⁶ found it difficult to persuade their focus group members to mention spontaneously written information. When asked about obtaining information over the Internet, respondents referred to the importance of a face to face information exchange.

"If somebody is telling you like a doctor or somebody you'll feel you've got to believe them or most of it but on a computer it is just typing" (13-year-old boy in Raynor and colleagues' study).⁷⁶

Raynor and colleagues concluded that the value of oral over written information was that such advice and explanation could be responsive to the needs and circumstances of a particular patient. This could be because the health professional knows the patient's state of affairs and/or the patient is able to ask about any uncertainties they may have.

Although obtaining information from doctors or possibly pharmacists was the ideal, often patients found it difficult to access them, especially doctors. In practice, patients had to rely substantially on written rather than verbal sources of information. This is not to say that written information was not valued. Written information could be kept for reference and absorbed over time. It could also give legitimacy to patients' concerns and queries about medicines as a topic to be raised with health professionals, although the issue of there being sufficient time or opportunity to ask such questions in the consultation still remained. In Pollock and colleagues' study there was a suggestion that it is not only issues of access and availability that determine whether patients are able to use written information as a basis for structuring discussions with health professionals, but also the perceived quality of the relationship which determined whether patients felt encouraged or confident enough to raise their problems and concerns.⁷⁵ These findings suggest that health professionals actively giving written information to patients could help build relationships by making it easier for patients to ask questions and raise concerns, in

addition to being the natural consequence of a good relationship where professionals were attuned to the information needs of their patients and responded to them.

The studies' findings indicated a range of respondent attitudes to written information. Some patients wanted information to enable them to participate in treatment decisions. However, not all patients wanted to take on a role of (shared) decision-maker and, in any case, patients' role preferences change over time and in different health circumstances. Cedraschi and colleagues quote one patient who did not consider receiving information on the pros and cons of a medicine as empowering.⁷⁰

A patient who described PILs as sometimes difficult to understand noted:

"they are a bit ... cumbersome ... sometimes there are as many reasons to avoid taking the medication as there are to take it ... there seems to be an explanation for both good and bad, so that you can no longer tell if the medication is any good or not" (82-year-old female with chronic abdominal pain in Cedraschi and colleagues' study).⁷⁰

Exposure to uncertainty was not desirable or beneficial in the case of this patient. While Nair and colleagues did not have any examples of patients feeling that they had been harmed by being given information, in the discussion section of their paper they call for research into "the adverse effects of talking about adverse effects".⁷⁴ They raise this in the context of conflicting evidence as to whether giving out risk information leads to non-compliance rather than out of concern for any patients who may prefer to let their doctors get on with the business of working out which treatment is best.

Spoken information which conflicts with what is written can be problematic for patients.⁷⁵ There was no detail in the studies as to how patients resolve such conflict, apart from an example in Cedraschi and colleagues' paper concerning a patient prescribed an antidepressant for chronic pain. When the doctor prescribed the antidepressant he explained that it was not being prescribed for depression but for pain.⁷⁰ However, when the patient, a 45-year-old woman with chronic palate pain, read the medicine leaflet:

"and it was all clear – I refused to take them; I said, sorry, it is not depression" (patient in Cedraschi and colleagues' study).⁷⁰

Cedraschi and colleagues note the influence of information in the leaflet on patient behaviour superseding advice from the doctor, as a result of a

misunderstanding about the indications of the medicine. It may also relate specifically to patients' resistance to a medicine perceived to be for a psychiatric rather than physical condition such as she considered her own experience of chronic pain. Cedraschi and colleagues concluded that where a patient considers his pain to be physical, even though his doctor may feel that he has made it clear that he is prescribing antidepressants for pain not depression, the unintended message in the written medicines information is that the doctor does not believe the patient's pain to be real. Although this example may be a very specific one, it points to the need to consider the role and value (and effectiveness) of written information within the wider context of the relationship between prescriber and patient and the understanding that it is negotiated between them.

Valuing patients' experience of illness and its treatment

Patients with chronic conditions often learn from experience a great deal about their illness and what works. There could be tension between official advice and experiential learning.

"Like asthmatics aren't supposed to take aspirin, yet that is the only thing I can take, I can't take anything else" (woman aged 40 years in Raynor and colleagues' study).⁷⁶

Several respondents in Raynor and colleagues' study described how they tested the efficacy of their medicines by starting and stopping them and monitoring the results.⁷⁶ Some considered that personal experience counted for more than the type of information collated by pharmaceutical company employees on a medicinal product. They felt that their experience should be used in writing leaflets on medicines.

Analysis of written information on antidepressants published by a self-help organisation showed a lack of congruence between the professional advice and explanations given about antidepressants (which it promoted) and the experiences of patients with depression.⁷² For example, the leaflet stated that antidepressants are not addictive. Physical addiction was rarely referred to in patients' accounts but psychological dependency was a concern, which was not acknowledged in the leaflet. In Raynor and colleagues' study⁷⁶ experiential knowledge was valued by patients.

"If you have people that suffer from the condition and they [patients] help write the information, they will do it in a very unambiguous manner so that people that read it will know exactly what is meant" (40-year-old woman in Raynor and colleagues' study).⁷⁶

For patients' experiential knowledge to be incorporated into written information would require not only consulting patients about their information needs before written materials are developed, but also involving them in setting the content of items of information.

Views of professionals

In Pollock and colleagues' study, professionals showed ambivalence towards patients receiving information about medication.⁷⁵ Positive outcomes that favoured giving information included building relationships between patient and professional, increasing the likelihood of medicines being taken effectively and aiding patient informed decision-making in addition to constituting a basic patient right. On the other hand, professionals perceived that information may increase non-compliance, encourage the development of side-effects, increase tension between patients and staff and lead to patients discovering troublesome things such as diagnosis or side-effects that staff would prefer to be withheld. In the psychiatric hospital, medicines were the dominant form of treatment and seen by staff to be the patients' route for recovery and discharge from hospital. Securing compliance was therefore important and a large part of staff ambivalence concerned the risk that information may decrease compliance. The same ambivalence can be seen in Nair and colleagues' study.⁷⁴ The views of the lay focus groups were fed back to groups of doctors and pharmacists. On the one hand, they acknowledged the importance of information about treatment options and alternatives to patients. On the other, they were concerned about the amount of information on side-effects and safety patients wanted. Professionals thought this extra information should be given only if it did not contribute to 'information overload, confusion or non-compliance'.

Little written information was available for patients on the acute psychiatric wards which were the setting for Pollock and colleagues' study.⁷⁵ None was routinely handed out. Although there was a general consensus that information to patients about their medicines should be improved, hospital staff did not regard the need to provide information as being as pressing as did their patients. Giving medicines was a routine task for professionals and it was easy to lose sight of the fact that it may feel far from routine to the patient. The attitudes of consultant psychiatrists sometimes posed a further barrier to the willingness of other staff to give information to

patients freely, whether written or spoken. Consultants showed great variation in their approach to the giving of information and other ward staff tended to take their lead from them, being reluctant to transgress the boundaries of responsibility for providing information, or risking inconsistency in the information provided by different members of staff.

A rather different professional view emerged from Herxheimer's study based on a content analysis of non-steroidal anti-inflammatory drug (NSAID) leaflets.⁷³ Herxheimer, who is himself a medical doctor, was concerned at the lack of consistency of information between leaflets and with their actual content. He criticised the leaflets for explaining key concepts in a way which did not present balanced information to patients on the risks and benefits of NSAIDs. Some leaflets used the words 'symptomatic relief' which patients may take to mean cure: only one leaflet explicitly said that the medicine did not cure. Many leaflets encouraged regular dosing and none referred to the idea of symptom alleviation rather than total relief as being a reasonable or realistic goal. There was insufficient information for patients to undertake a personal benefit/risk analysis in order to decide whether and how much of the drug to take. Herxheimer, however, felt that most doctors and pharmacists would doubt that patients were capable of modifying the dose of a drug to meet personal need. The experts reviewing written information in Coulter and colleagues' study⁷¹ were also critical of the tendency to be over-optimistic in leaflets, stressing the benefits of a treatment while downplaying risks and side-effects.

Herxheimer expressed concerns about the preparation of leaflets by employees of the pharmaceutical industry who are far removed from the patients who will read the leaflets and take the medicines. In the empirical studies, patient fears went further to include concerns about the conflict of interests for pharmaceutical companies who were both selling the medicines and writing the leaflets.^{75,76}

"Actually sometimes when you look at these [prominent information about drug manufacturer at the beginning of leaflets], it looks more like an advert at the front is what puts people off" (35-year-old woman in Raynor and colleagues' study).⁷⁶

Thus patients queried the independence of the information in the leaflets produced by pharmaceutical companies. Raynor and colleagues question the basis for patients' fears about the independence of information written by medicine

manufacturers since the industry has to comply with European regulations and have leaflets approved by the Medicine Control Agency (MCA) (now MHRA). However, all the medicine leaflets reviewed in Herxheimer's study had been subject to regulation and MCA approval, yet he found the content of NSAID leaflets lacked clarity, completeness and consistency.⁷³ The content appeared to be to the advantage of the NSAID manufacturers in making the drugs more attractive and thereby encouraging consumption.

Nursing staff in Pollock and colleagues' study spoke about the role of verbal and written information in satisfying medico-legal requirements to obtain patients' informed consent to treatments that nurses administered.⁷⁵ Some patients in Raynor and colleagues' study considered that the content of medicines leaflets was dictated by medico-legal issues and regulatory requirements rather than the needs of patients.⁷⁵

Summary of the findings

From the findings of 27 heterogeneous studies that were analysed, a number of themes emerged about the role and value of patients' written medicines information to patients and health professionals. Patients valued written information that contained condition-based information alongside medicines information, in addition to alternative treatments for the condition. This could help reassure that the right drug had been prescribed and to gain an understanding of why the doctor had chosen that particular treatment. They would prefer information to be personalised and relate to their specific circumstances, and that patients' experiential knowledge of medicines should be taken into account. They wanted to know about the long- and short-term side-effects of taking a medicine. Although this could be worrying for some, mostly patients preferred to be worried and aware than not aware. They did not want information that was hard to understand and difficult to read, but this was not the same as saying they wanted short and simple leaflets. They wanted sufficient depth and breadth of information to meet their needs. As their needs varied, so did the amount of information they wanted. They were concerned about the conflict of interests when those who make medicines also write the information leaflets. Written information could not be divorced from verbal information. A conflict between the two was a concern. Patients did not want written information to be a substitute for verbal information from their doctor, which was the more highly valued. Written information could be retained for reference. As the basis of

discussion in medical consultations, it could also constitute a stimulus to the strengthening of doctor–patient relationships.

Not all patients used written information. Some patients only wanted to receive verbal information from their doctor. Those who used it did so in a variety of ways. Some patients wanted to be involved in treatment decisions and written information could help. Although others did not want much or any involvement, they still faced ongoing day-to-day decisions in managing their medicines such as whether they could combine an OTC with a prescription medicine. Written information was useful in those circumstances. Having information about side-effects helped with preparing for and recognising them, and knowing what action to take if they occur. There was little evidence to suggest that patients used side-effects information to decide on that basis alone not to take a drug.

There were few studies that investigated the professionals' perspective. Professionals valued written information that was short and simple as they considered that more complex information would not be understood and would overload the patient. They preferred to disclose information about selected side-effects as they believed revealing the full list could cause patients not to take a medicine. They placed more emphasis on informing patients about the benefits of a medicine and what would happen if they did not take it. The main use of written information from a professional perspective was to help patients comply with their treatment. Written information could help save time in the consultation and recording that it had been handed out could be useful if there was a subsequent dispute between doctor and patient as to whether or not the latter had been informed about the risks of a medicine.

Effectiveness review

Overview

In total, 36 papers reporting 43 trials met the inclusion criteria. These 43 trials were categorised by experimental intervention and comparison:

1. Written medicines information versus nothing: 10 trials^{34,78–86}
2. Written medicines information + oral information versus oral: eight trials^{87–94}
3. Written medicines information versus written medicines information: six trials^{95–100}
4. Written medicines information versus various: six trials^{101–104}
5. Written medicines information risk descriptor versus written medicines information risk descriptor: 13 trials^{35,105–111}

Fourteen trials used information for medicines for long-term conditions:

- eight used NSAIDs;^{79,82,87,90,91,99,100,109}
- six focused on a medicine for mental illness^{84,86,93,96,97,104}
- 13 trials referred to an antibiotic;^{78,89,102,105–110} (ten of these trials looked at a hypothetical antibiotic).

The remaining trials looked at information for a range of different medicines. The information design was theory driven or evidence-based in 13 trials (39%).^{35,78,79,86–88,93,95,98,100–102,104}

Theory-based trials

- Bergus and colleagues, 2002 (information-order effect)³⁵
- Dodds, 1986 (recommendations of *Drugs and Therapeutic Bulletin*, 1981)⁷⁸
- Dolinsky and colleagues, 1983 (theory of read–organise–attend)¹⁰²
- Weiderholt and Kotzan, 1983 (model of communication and persuasion)⁸⁶
- Vander Stichele and colleagues, 2002 (on theories of self-efficacy and risk perception)¹⁰⁴
- Whatley and colleagues, 2002 (test risk/benefit information on behaviour)¹⁰⁰
- Quaid and colleagues, 1990 (different standards of informed consent)⁹⁸
- Baker and colleagues, 1991 [Plain English campaign involved in written medicines information (WMI) design].⁸⁸

Evidence-based trials

- Gibbs and colleagues, 1989 (intervention had been previously piloted)⁷⁹
- Labor and colleagues, 1995 (revised in a pilot study, and using Flesch reading levels test)⁹⁵
- Arthur and Clifford 1998 (based on experience working as a nurse)⁸⁷
- Strydom and Hall, 2001 (intervention had been previously piloted)⁹³
- Clark and Bayley, 1972 (intervention based on results from questionnaire).¹⁰¹

The trials were conducted in eight countries: UK (19 trials); USA (12 trials); Belgium (five trials); Canada (three trials); and Finland, France, Hong Kong, and Turkey (one trial in each). The earliest identified trial was published in 1972 and the last

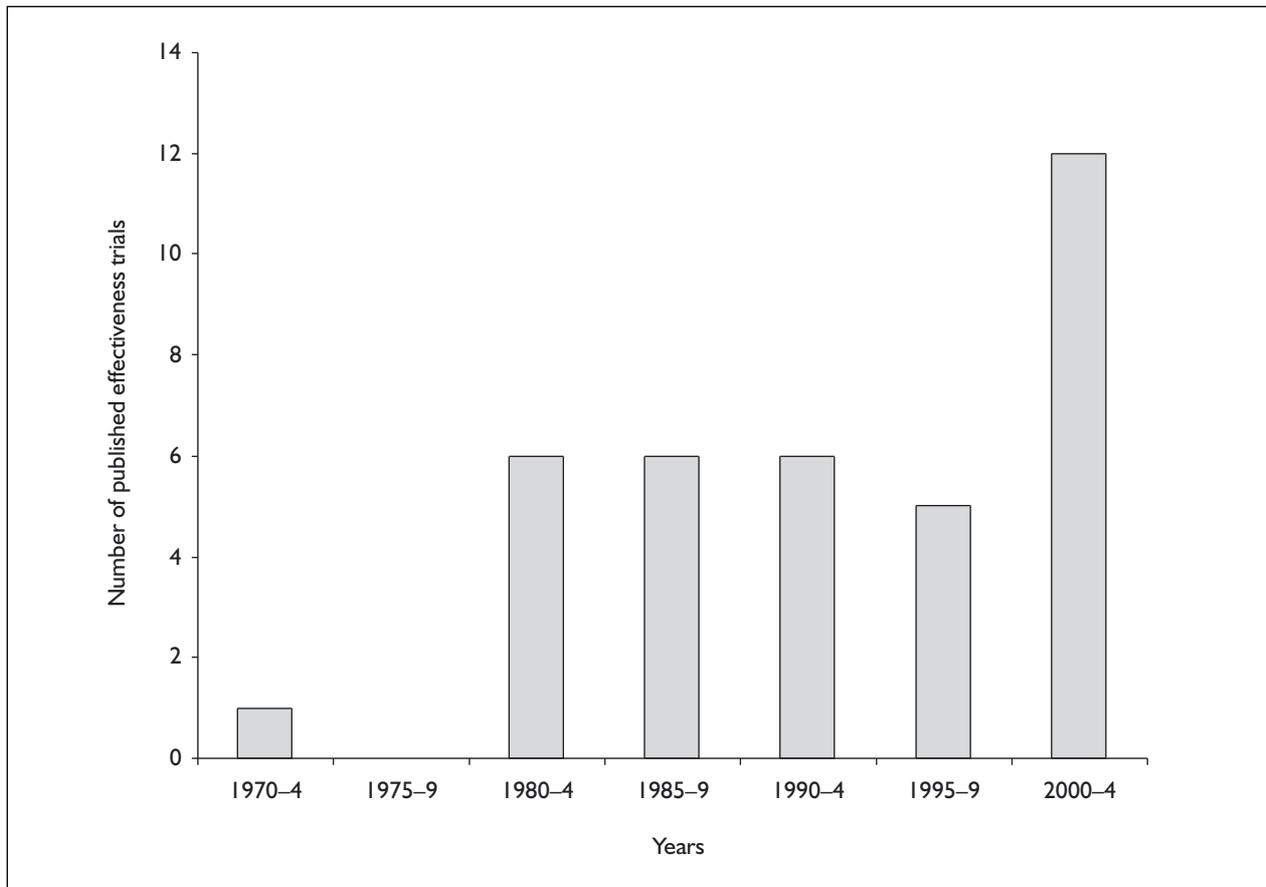


FIGURE 1 Published effectiveness trials 1970–2004

in 2004 (*Figure 1*). There was a steady rate of publication of trials of effectiveness of WMI between the early 1980s and the end of the 1990s. More trials examining the effectiveness of WMI were published between 2000 and 2004 than in the years before.

Length of follow-up, reported in 35 trials (81%), ranged from immediate (same day) to 111 days. Mean length of follow-up was 29 days. Twenty-four papers (69%) published a full (or partial) copy of the WMI.^{34,78,79,81,85,86,88–91,95–98,101–108,110,111}

Authors of four further papers provided a copy on request.^{35,84,87,100} One trial examined programmed instructions (providing information, then asking questions),¹⁰¹ one trial provided ‘electronically produced information’,⁸⁹ one provided the information as a booklet⁹⁴ and one in a patient information wallet.⁸⁸ No eligible RCTs evaluating the effectiveness of web-based medicines information were found.

WMI was delivered to participants in the trials largely by being personally handed to them, although provision was not clearly reported in many trials. Only five trials (8.6%) provided the

information at the same time as the treatment was supplied (current routine practice throughout the EU).^{34,78,85,97,99}

The source of funding was reported in 16 trials.^{79,81,83–85,87,88,95–97,99,100,103,104,106,107} Eleven trials were funded by a national funding body, four were funded by a charitable organisation and two were funded by a pharmaceutical company. One trial received joint funding from both a research council and pharmaceutical company.⁸⁴

All authors were contacted via email or post to request missing data and a copy of the written information intervention if one was not provided with the report of the trial. Seven authors (of 10 papers) answered the request for missing data.^{34,35,84,87,103–105,109–111} Copies of the interventions available (from either the paper or the authors) can be found in Appendix 9.

Trials categorised by intervention

This section first presents descriptive and qualitative information about the trials categorised by intervention, then describes the results for each group of categories according to

their outcome measure, that is, knowledge, attitudes or behaviour. Lastly, the results for each outcome across the different intervention categories (the primary focus of the analysis) are described.

Trials comparing written medicines information versus no intervention

Description of included trials

Ten trials conducted between 1982 and 1999 met the review inclusion criteria (*Table 8*).^{34,78-86} They enrolled 1821 participants (range: 34-719) who were currently receiving treatment, and all interventions were based on the provision of information for an actual medicine (rather than one that was fictitious).

The trials compared one group receiving WMI with one control group who received no intervention. The experimental interventions varied between trials. Three interventions were based on (then) current policy recommendations for an actual leaflet:

- Peveler and colleagues, 1999 (EU Directive-based information leaflet)⁸⁴
- Vander Stichele and colleagues, 1992 (a standard patient package insert for a range of antihypertensive medicines)³⁴
- Weiderholt and Kotzan, 1983 (information designed in accordance with US Federal Guidelines).⁸⁶

One trial, by Vesco and colleagues, used an information package containing the manufacturer's instructions.⁸⁵ The remaining trials used an intervention which had been devised specifically for the study.

The mean age of participants, reported in six trials, was 48 years, with a range (reported in five trials) from 16 to 83 years, and 41% of participants were male. Ethnic background was reported in two trials. All those in the trial by Vander Stichele and colleagues were white,³⁴ whereas 88% of participants in the trial by Morris and Kanouse were from an ethnic minority.⁸³ The educational attainment of participants was reported in three trials.^{80,83,86} Withdrawal from the trials, reported in three trials, averaged 23%.^{34,78,85}

Quality of the included trials

Reporting of the methods of the trials was generally incomplete. Of the three trials that reported how randomisation was conducted, two described an adequate means of

randomisation.^{34,84} Weiderholt and Kotzan described an inadequate form of randomisation (alternate allocation), casting doubt on the validity of the trial.⁸⁶ McBean and Blackburn did not clearly report the process.⁸² No trials reported an adequate means of concealing the randomisation process from the treatment provider, while four reported using an inadequate method.^{34,79,84,86} Adequate blinding of the outcome assessor was reported in six trials.^{34,78,80,81,84,86} Loss to follow-up, reported in eight trials, averaged 21%.^{34,78,81-86}

Components of the intervention

McBean and Blackburn⁸² did not provide a copy of the intervention or a description of its content. The remaining trials used interventions which all included information on 'what this medicine is and what it is used for' and 'how to take', using between two and five of the content categories currently recommended by the EU (*Table 9*).

Information about side-effects was mentioned in all trials except that of Kumana and colleagues.⁸¹ Around three-quarters of trials provided information about precautions before taking the medicine.^{34,78,79,83-86} Information about storage of the medicine was provided by four trials only.^{34,79,84,85}

Only three trials used interventions which did not use difficult words (described as easy-to-read).^{78,79,84} Greater thought was given to the layout of the information, with half of the interventions showing evidence of this, through the use of discrete headings.^{34,78,79,83,84}

The trials by Gibbs and colleagues⁷⁹ and Peveler and colleagues⁸⁴ were the only ones to include all five content categories and were judged to have 'Good layout' and 'Easy-to-read-language'.

Outcome measures

Seven of the 10 trials measured a knowledge outcome and six had a behaviour outcome measure. One trial measured an attitude outcome.

Knowledge outcomes. A 'knowledge' outcome was measured in seven trials,^{78-83,86} and the outcomes included 'recall of correct medicine taking information',⁷⁸ 'knowledge about the study medicine',⁷⁹⁻⁸² 'correct side-effects named',⁸³ and a 'knowledge and comprehension examination'.⁸⁶ Six trials found WMI increased a knowledge measure more than no intervention.^{78-80,82,83,86} (see Appendix 6).

TABLE 8 Details of trials comparing written medicines information versus nothing

Trial	n	Patients ^a	Mean age (range) (years)	Male (%)	Trial drug	Nature of intervention	Outcome assessor masked	Randomisation	Concealment	Loss to follow-up
Dodds, 1986 ⁷⁸	68	Yes	28.0 (16–81)	23.0	Antibiotics	Information sheet	Yes	^b	^b	2/68 (3.0%)
Gibbs et al., 1989 ⁷⁹	719	Yes	^b (≥ 16)	36.2	β -Blocker, NSAID or bronchodilator inhaler	Information sheet	^b	^b	Inadequate	^b
Johnson et al., 1986 ⁸⁰	34	Yes	57.9	79.4	Digoxin and propranolol	Information sheet	Yes	^b	^b	^b
Kumana et al., 1988 ⁸¹	111	Yes	56.3	37.4	Hypoglycaemic	Information sheet	Yes	^b	^b	4/111 (3.6%)
McBean and Blackburn, 1982 ⁸²	155	Yes	^b	^b	Cardiology drug, NSAID, cimetidine	^b	^b	^b	^b	41/155 (26.5%)
Morris and Kanouse, 1982 ⁸³	249	Yes	51.5	54.0	Thiazide diuretic	Information sheet	^b	^b	^b	104/249 (41.8%)
Peveler et al., 1999 ⁸⁴	213	Yes	45.3 (21–83)	27.3	Dothiepin	Information sheet	Yes	Adequate	Inadequate	9/213 (4.2%)
Vander Stichele et al., 1992 ³⁴	74	Yes	^b (52–70)	49.0	β -Blocker or ACE inhibitor	Information sheet	Yes	Adequate	Inadequate	28/74 (37.8%)
Vesco et al., 1990 ⁸⁵	40	Yes	43.0	75.0	Theophylline	Information sheet	^b	^b	^b	3/40 (7.5%)
Wiederholt and Kotzan, 1983 ⁸⁶	158	Yes	^b (≥ 18)	28.7	Benzodiazepine	Information sheet	Yes	Inadequate	Inadequate	22/158 (13.9%)

^a People currently taking the medicine(s) being studied.^b Not reported or unclear.

TABLE 9 Components of interventions in trials comparing written medicines information versus nothing

Trial	EU content categories						Presentation			Other	
	What this medicine is and what it is used for	Before taking the medicine	How to take the medicine	Possible side-effects	How to store	Easy-to-read language	Attention to layout	Copy of intervention available	Theory/ evidence-based		
Dodds, 1986 ⁷⁸	✓	✓	✓	✓	×	✓	✓	✓	✓	✓	
Gibbs <i>et al.</i> , 1989 ⁷⁹	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Johnson <i>et al.</i> , 1986 ⁸⁰	✓	×	✓	✓	×	?	?	×	×	×	
Kumana <i>et al.</i> , 1988 ⁸¹	✓	×	✓	×	×	×	×	✓	×	×	
McBean and Blackburn, 1982 ⁸²	?	?	?	?	?	?	?	×	×	×	
Morris and Kanouse, 1982 ⁸³	✓	✓	✓	✓	×	×	✓	×	×	×	
Peveler <i>et al.</i> , 1999 ⁸⁴	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	
Vander Stichele <i>et al.</i> , 1992 ³⁴	✓	✓	✓	✓	✓	×	✓	✓	✓	×	
Vesco <i>et al.</i> , 1990 ⁸⁵	✓	✓	✓	✓	✓	×	?	✓	✓	×	
Wiederholt and Kotzan, 1983 ⁸⁶	✓	✓	✓	✓	×	×	✓	✓	✓	×	

✓, Provides component; ?, unclear if provides component or not; ×, does not provide component.

Two trials found statistically significant results (Dodds⁷⁸ and Johnson and colleagues⁸⁰). Participants receiving the WMI in the trial by Dodds recalled three more items of information (out of a possible 10) on a bespoke knowledge test, than participants receiving nothing.⁷⁸ Johnson and colleagues found that participants receiving information about their medicine had greater knowledge of the medicine at the end of 1 month than those not receiving information.⁸⁰ Kumana and colleagues found knowledge about diabetes and its treatment was lower among participants receiving information than for those receiving no intervention at the end of 3 months' follow-up, although the difference was not statistically significant.⁸¹ This result may be misleading because a baseline imbalance favoured the control group, while knowledge actually increased more for those receiving written information than controls.

Attitudinal outcomes. One trial, by Gibbs and colleagues,⁷⁹ compared WMI with no intervention and measured an attitude outcome measure (overall patient satisfaction response for information received). The results were aggregated across information for different study medicines, so although the trial found statistically significant findings for the different information leaflets, it is impossible to say if the results are statistically significant overall.

Behaviour outcomes. A behavioural outcome (most commonly relating to taking the medicine or reporting of side-effects) was measured in six trials.^{34,78,82-85} All trials except that by Peveler and colleagues⁸⁴ found that the group given written information changed their behaviour more often than those given no written information. Two of the trials found a statistically significant difference favouring the provision of information for having an impact on behaviour.^{78,85}

Participants receiving information in the trial by Dodds⁷⁸ took significantly more antibiotics over the course of the 3–5-day trial, compared with the control group who received nothing. This trial reported that participants receiving written information were significantly more likely to comply (defined as a composite of drug taking and knowledge) with treatment at 3 months. Vesco and colleagues found significantly more participants given WMI stopped taking their theophylline (measured by a pill count), and reported a significantly higher number of side-effects from the medication, compared with the control group.⁸⁵

Peveler and colleagues found no difference in levels of adherence to antidepressant treatment between participants receiving a medicines leaflet or no intervention.⁸⁴ The information in the leaflet conformed to all eight of the content categories; randomisation was adequate, as was blinding of the outcome assessor. Vander Stichele and colleagues similarly found that providing information was marginally more effective, but not statistically significant, than providing nothing for patients complying with instructions for how to take their medicine (measured by electronic count).³⁴

Trials comparing written medicines information and oral information versus oral information alone **Description of included trials**

Eight controlled trials were reported as randomised and met the review inclusion criteria (Table 10).⁸⁷⁻⁹⁴ They were conducted between 1987 and 2001, and included 970 participants (range: 18–500). All enrolled participants currently receiving treatment, and all were based on the provision of information about a real medicine.

The trials compared written and oral information against oral information alone, where any difference between the two on the outcomes can be attributed to the provision of the additional written information. The trials by Arthur and Clifford,⁸⁷ Regner and colleagues,⁹² Savas and Evcik⁹¹ and Young and Brooks⁹⁴ provided the written information in spoken form to both groups, while Pope and colleagues⁹⁰ and Strydom and Hall⁹³ gave both groups spoken information dissimilar to the written information. Baker and colleagues provided the intervention group with a patient information wallet which comprised two medicines leaflets – one providing general advice about the medicine treatment and the other specific information about the medicine.⁸⁸ Peura and colleagues provided electronically produced information (a computer printout from a program containing information about the study medicine, written in Finnish and Swedish).⁸⁹ Regner and colleagues provided a leaflet endorsed by the American Society of Hospital Pharmacists, based on contemporary patient education material.⁹² Pope and colleagues⁹⁰ and Savas and Evcik⁹¹ distributed separate leaflets with corresponding content about an NSAID. Although the language was not stated, it can be assumed that they were different, as the former trial was carried out in Canada and the latter in Turkey.

The mean age of subjects, reported in six trials, was 48 years (range: 20–88 years).^{87,88,90,91,93,94} Just over 34% of subjects were male. The ethnic

TABLE 10 Details of trials comparing written medicines information and oral information versus oral information alone

Trial	n	Patients ^a	Mean age (range) (years)	Male (%)	Trial drug	Nature of intervention	Outcome assessor masked	Randomisation	Concealment	Loss to follow-up
Arthur and Clifford, 1998 ⁸⁷	80	Yes	53.5	27.0	NSAID	Information sheet	– ^b	Adequate	Adequate	6/40 (15.0%)
Baker et al., 1991 ⁸⁸	125	Yes	52.4 (20–83)	63.4	Cardiology drugs	Information leaflet and sheet	– ^b	– ^b	– ^b	24/125 (19.2%)
Peura et al., 1993 ⁸⁹	500	Yes	^b	27.0	Antibiotics	Electronically produced information sheet	Yes	– ^b	– ^b	77/500 (15.4%)
Pope et al., 1998 ⁹⁰	72	Yes	48.0 (35–62)	31.0	NSAID	Information sheet	Yes	Adequate	Inadequate	1/72 (1.4%)
Regner et al., 1987 ⁹²	48	Yes	– ^b	^b	Digoxin	Information sheet	– ^b	– ^b	– ^b	14/48 (29.2%)
Savas and Evcik, 2001 ⁹¹	70	Yes	49.5 (28–73)	20.9	NSAID	Information sheet	– ^b	Adequate	– ^b	9/70 (12.9%)
Strydom and Hall, 2001 ⁹³	57	Yes	36.0	63.0	Psychotropic	Information sheet	Yes	Adequate	Inadequate	6/57 (10.5%)
Young and Brooks, 1986 ⁹⁴	18	Yes	38.5 (25–50)	33.3	Methyl-prednisolone	Information booklet	– ^b	Inadequate	Inadequate	0/18 (0%)

^a People currently taking the medicine(s) being studied.^b Not reported or unclear.

background of participants was not reported in any trial. Previous education status was reported in one trial.⁹⁰ Participants in the trial by Strydom and Hall were recruited from a population with learning disabilities, where 40% had little or no reading ability.⁹³ Withdrawal, reported in four trials, was around 9% overall.^{87,91,93,94}

Quality of the included trials

Reporting of the methods was variable. Five trials reported how randomisation was conducted, and this was judged to have been adequately conducted in four trials.^{87,90,91,93} Only one trial reported an adequate means of concealing the allocation process⁸⁷ and three trials performed this inadequately.^{90,93,94} Adequate masking of the outcome assessor was reported in three trials.^{89,90,92} Loss to follow-up, reported in every trial, was 131/890 (15%).

Components of the intervention

The trials varied greatly in the number of information components in the tested intervention (*Table 11*). Strydom and Hall did not provide a copy of the information or report the components of the information, other than to say it was evidence based and contained illustrations.⁹³ All other interventions included information about 'what this medicine is and what it is used for' and 'possible side-effects'.

Half of the trials were judged to use easy-to-read language^{87,88,90,91} and two presented the layout of the information in an accessible manner.^{88,92} Furthermore, two trials of the eight interventions were based on theory or evidence.^{88,93}

Outcome measures

A 'knowledge' outcome was measured in every trial, whereas attitudinal and behavioural outcomes were measured in only one trial.⁸⁸

Knowledge outcomes. 'Knowledge' was measured by a trial-specific measure in the eight studies.⁸⁷⁻⁹⁴ Six trials found a statistically significant difference in knowledge scores between the groups, such that the addition of WMI led to increased knowledge.^{87-89,91,92,94}

Regner and colleagues found that additional written information led to significantly greater recognition of side-effects caused by the medicine.⁹²

Baker and colleagues examined recall of eight separate categories of aspects of the medicine and found that additional written information had a

significantly greater effect for four outcomes: treatment purpose, action if a dose is missing, possible side-effects and action regarding side-effects. They found no difference between the interventions for the four other outcomes: when to take the medicine, how to take it, whether you can drive when taking it, whether you can drink alcohol when taking it.⁸⁸

Arthur and Clifford found that participants receiving additional written information were more likely to identify correctly the names of 10 NSAID medicines from a list (all statistically significant differences). There was no difference between the groups for the two other medicines on the list.⁸⁷

Peura and colleagues found a statistically significant difference favouring additional written information for correctly recalling information about their antibiotics: what to do if they missed a dose, naming at least one correct side-effect and recalling the recommendations for drinking alcohol when taking the medicine.⁸⁹ There was no significant difference between the groups for two points of information: taking the medicine with water and using the sauna when taking the medicine.⁸⁹

Young and Brooks conducted a bespoke knowledge test and found that participants receiving additional written information had significantly higher scores.⁹⁴ All 10 participants in the additional written information group improved their knowledge score from baseline, whereas only three (of eight) participants in the spoken information only group did so.

Savas and Evcik found that participants who received additional written information scored significantly higher over eight questions about their medicines compared with those receiving oral information alone.⁹¹ This trial replicated that by Pope and colleagues, which found a statistically significant result showing additional written information to be less effective than oral information alone.⁹⁰ Participants given additional written information recalled less information about side-effects of NSAID medicines than those receiving spoken information alone. The additional written information group also recalled fewer correct side-effects.⁹⁰ Participants receiving the additional written information correctly identified the answer more often than the spoken information only group for six of nine other questions, only one of which was statistically significant. Participants in the spoken only group

TABLE 11 Components of interventions in trials comparing written medicines information and oral information versus oral information alone

Trial	EU content categories					Presentation			Other	
	What this medicine is and what it is used for	Before taking the medicine	How to take the medicine	Possible side-effects	How to store	Easy-to-read language	Attention to layout	Copy of intervention available	Theory/ evidence-based	
Arthur and Clifford, 1998 ⁸⁷	✓	✓	✓	✓	×	✓	✓	✓	×	×
Baker et al., 1991 ⁸⁸	✓	×	✓	✓	×	✓	✓	✓	✓	✓
Peura et al., 1993 ⁸⁹	✓	×	✓	✓	×	×	×	✓	×	×
Pope et al., 1998 ⁹⁰	✓	✓	×	✓	×	✓	×	✓	✓	×
Regner et al., 1987 ⁹²	✓	✓	✓	✓	✓	?	✓	×	×	×
Savas and Evcik, 2001 ⁹¹	✓	✓	×	✓	×	✓	×	✓	×	×
Strydom and Hall, 2001 ⁹³	×	×	×	×	×	×	×	×	×	✓
Young and Brooks, 1986 ⁸⁴	✓	✓	✓	✓	×	?	?	×	×	×

✓, provides component; ? = unclear if provides component or not; X, does not provide component.

were more likely to know not to take NSAIDs on an empty stomach. On the other hand, significantly more participants receiving the additional written information knew that NSAIDs help with pain.⁹⁰

Strydom and Hall found no substantive difference in participant knowledge between those receiving additional written information: this result was not significant.⁹³

Attitudinal outcomes. Baker and colleagues asked participants whether they felt sufficient information had been given, whether it was clear and whether it could be improved. Significantly more participants receiving additional written information (compared to those receiving none) felt sufficient information had been given, found the information to be clear and understandable and were less likely to feel information could be improved.⁸⁸

Behavioural outcomes. Baker and colleagues recorded anxiety about taking medicine after the intervention (the nature of the measure was not reported). They found that significantly more participants receiving additional written information reported reduced worry about taking the medicine.⁸⁸

Trials comparing written medicines information versus written medicines information

Description of included trials

Six trials conducted between 1980 and 2002, including 1404 participants, met the review inclusion criteria (*Table 12*).^{95–100} Four trials enrolled participants who were currently receiving treatment, and all were based on the provision of information on an actual medicine.

The six trials compared the relative effect of two or more information interventions. Two trials compared information that varied according to only one variable:

- Quaid and colleagues varied the number of side-effect risks reported.⁹⁸
- Van Haecht and colleagues varied the presentational style.⁹⁹
- Morris and Kanouse compared information with ‘reassuring text’ and side-effects in numerical list or paragraph form against information written in a ‘frank tone’ and side-effects in numerical list or paragraph form.⁹⁷ The reassuring information placed less emphasis on negative outcomes and ensured a balanced perspective of positive and negative

information, whereas the frank information gave greater weight to negative outcomes.⁹⁷

Labor and colleagues,⁹⁵ Morris and colleagues⁹⁶ and Whatley and colleagues,¹⁰⁰ compared more than two written interventions.

The number of participants per trial ranged from 32 to 456. Three trials enrolled patients currently receiving treatment^{98–100} and the remainder enrolled the general public. The mean age of participants, reported in five trials, was 29 years (range: 14–82 years). Just over 47% of subjects were male, reported in all trials except one.⁹⁵ No trial reported the ethnic background of participants. Education status was reported in five trials^{95–99} and participants were educated to at least high-school level. In two trials over two-thirds of participants were university students.^{96,97} Withdrawal, reported in three trials, averaged 6%.^{95,96,98}

Quality of the included trials

Reporting of the methods was often incomplete. Three trials reported how randomisation was conducted, and this was judged to have been adequate.^{98–100} One trial reported how the allocation process was concealed,⁹⁸ and this was judged to be inadequate. Adequate masking of the outcome assessor was reported in only one trial.⁹⁹ Loss to follow-up, reported in three trials, was 109/548 (20%).^{95,98,99}

Components of the intervention

The trials adopted fewer than six information components on average, range 3–7 (*Table 13*). A copy of the information was provided by five trials.^{95–98,100} Half of the interventions were theory based.^{95,98,100} Two content components were common to all interventions: ‘what this medicine is and what it is used for’ and ‘possible side-effects’.^{95,97–100} The trial by Van Haecht and colleagues was the only one to include all of the content components in its intervention.⁹⁹

One trial varied the complexity of the wording and the amount of information provided.⁹⁵ None presented the layout in an easily accessible format.

Outcome measures and results

Two trials measured a ‘knowledge’ outcome,^{97,98} three an ‘attitudinal’ outcome^{95,96,100} and two a ‘behavioural’ outcome.^{98,99}

Knowledge outcomes. Morris and Kanouse⁹⁷ presented participants with

TABLE 12 Details of trials comparing written medicines information versus written medicines information

Trial	n	Patients ^a	Mean age (range) (years)	Male (%)	Trial drug	Nature of interventions	Outcome assessor masked	Randomisation	Concealment	Loss to follow-up
Labor <i>et al.</i> , 1995 ⁹⁵	150	No	42.8	— ^b	Antihistamine	5 arms with combinations of complexity and scope of information	— ^b	— ^b	— ^b	56/150 (37.3%)
Morris <i>et al.</i> , 1980 ⁹⁶	204	No	17.8	37.1	Diazepam	5 arms with combinations of sentence length and complexity of information	— ^b	— ^b	— ^b	— ^b
Morris and Kanouse, 1981 ⁹⁷	456	No	22.8	48.0	Flurazepam	2 arms with either frank or reassuring tone of text	Yes	— ^b	— ^b	— ^b
Quaid <i>et al.</i> , 1990 ⁹⁸	32	Yes	35.6	21.4	Carbamazepine	2 arms with 5 benefits and either 9 or 17 side-effects risks stated	— ^b	Adequate	Inadequate	— ^b
Van Haecht <i>et al.</i> , 1991 ⁹⁹	366	Yes	38.0 (14–82)	55.0	NSAID	New format vs traditional format information	Yes	Adequate	— ^b	— ^b
Whatley <i>et al.</i> , 2002 ¹⁰⁰	196	Yes	— ^b	— ^b	Hypothetical NSAID	Information presented in verbal, icon or graphical format	— ^b	Adequate	— ^b	— ^b

^a People currently taking the medicine(s) being studied.

^b Not reported or unclear.

TABLE 13 Components of interventions in trials comparing written medicines information versus written medicines information

Trial ^a	EU content categories				Presentation			Other	
	What this medicine is taking and what it is used for	Before taking the medicine	How to take the medicine	Possible side-effects	How to store	Easy-to-read language	Attention to layout	Copy of intervention available	Theory/evidence-based
Labor <i>et al.</i> , 1995: ⁹ Intervention 1–Intervention 5	✓	✓	✓	✓	×	Varied	×	✓	✓
Morris <i>et al.</i> , 1980: ⁹⁶ Intervention 1–Intervention 4	✓	×	×	✓	×	×	×	✓	?
Morris and Kanouse, 1981: ⁹⁷ Intervention 1 and Intervention 2	✓	✓	×	✓	×	×	✓	✓	?
Quaid <i>et al.</i> , 1990: ⁹⁸ Intervention 1	✓	×	×	17	×	×	✓	✓	✓
Quaid <i>et al.</i> , 1990: ⁹⁸ Intervention 2	✓	×	×	9	×	×	×	✓	✓
Van Haecht <i>et al.</i> , 1991: ⁹⁹ Intervention 1 and Intervention 2	✓	✓	✓	✓	✓	?	?	×	×
Whatley <i>et al.</i> , 2002: ¹⁰⁰ Intervention 1	✓	✓	✓	✓	×	×	×	✓	✓
Whatley <i>et al.</i> , 2002: ¹⁰⁰ Intervention 2	✓	✓	✓	✓	×	×	×	✓	✓
Whatley <i>et al.</i> , 2002: ¹⁰⁰ Intervention 3	✓	✓	✓	✓	×	×	×	✓	✓

✓, Provides component; ?, unclear if provides component or not; X, does not provide component.
^a These trials used more than one WMI, which were compared against each other.

- information written in a 'reassuring tone' and side-effects in numerical list or paragraph form, or
- information written in a 'frank tone' and side-effects in numerical list or paragraph form, and examined their knowledge on 10 points about the study medicine, diazepam.

Participants receiving information written in a 'reassuring' tone more often knew the length of time it would take for the medicine to work and when to seek more information, which was statistically significant. Participants receiving information written in a 'frank' tone knew more about the medicine's side-effects, about having taken the medicine for a long time and about the use of the medicine by children, which was statistically significant. There was no significant difference between the two interventions for how to reduce side-effects, what action to take if the medicine was not effective, about the 'hangover effect' of the medicine and if the effects were more noticeable after a few nights of use.

Quaid and colleagues gave half the participants information detailing five benefits and 17 risks and side-effects for the study medicine (carbamazepine), and the other half the same information on benefits and fewer listed side-effects. Those receiving more information about side-effects were able to recall significantly more side-effects on average than the group receiving less information.⁹⁸

Attitudinal outcomes. Labor and colleagues found that significantly more participants who received written information of 'normal' wording, judged the topic length of the information to be 'about right' and complexity of the information to be 'about right', compared with the four other intervention groups.⁹⁵

Participants also rated their judgement of the components of information as 'confused', 'unsure', 'doubtful', 'overwhelmed' or 'foolish'. Those who received professional wording and two items of information were most critical, scoring significantly higher on the summed judgement score.⁹⁵ The groups receiving 'professional worded' information and two or 12 topic scope scored equal highest on the summed emotional score for reported feelings of 'frustration', 'anger', 'anxiety', 'vulnerability' and 'irritation'.⁹⁵

Participants were asked to rate their evaluation of the components of information as 'useful', 'valuable', 'satisfying', 'beneficial' or 'helpful'. Participants receiving simple worded information

of 12 topic scope scored highest on this summed score.⁹⁵

Morris and colleagues recorded the attitudes of participants allocated to one of four different leaflets and found a lack of uniformity in the results. Participants who received information with simple phrasing and uncontrolled vocabulary judged the information to have greatest interest value (a composite of the perceived 'liveliness', 'stimulation' and length of the information).⁹⁶ Those who received information with complex phrasing and jargonised vocabulary gave the information the greatest positive evaluation (a composite of 'reassuring', 'respectful', 'good' and 'turned on'), which was statistically significant. This information was also judged to have the best 'adult readability'.⁹⁶

Whatley and colleagues measured participants' willingness to take a fictitious medicine after presentation with one of three different types of information. Participants given a narrative leaflet documenting all potential adverse events, without the probability of occurrence, were significantly less likely to take a fictitious medicine compared with the groups presented with information which portrayed information about side-effects in iconic or graphic form.¹⁰⁰

Behavioural outcomes. Two trials measured behavioural outcomes. Quaid and colleagues found no tangible difference in reporting of side-effects between the interventions.⁹⁸ Van Haecht and colleagues found that a greater number of participants who had received the new format information, reported reading it thoroughly.⁹⁹ No significance value was reported for this finding.

Trials comparing written medicines information versus various interventions

Description of included trials

The reviewers included six trials (reported in four papers), conducted between 1972 and 2002, and enrolling 1226 participants (range: 45–271) (*Table 14*).^{101–104} Vander Stichele and colleagues reported three trials.¹⁰⁴ Three trials enrolled participants currently receiving treatment.^{101–103} Two trials enrolled women from a community association¹⁰⁴ and one caregivers of patients receiving psychiatric care.¹⁰⁴ All trials provided information for an actual medicine.

The trials compared two different WMI interventions with a third arm receiving no intervention. Clark and Bayley compared a programmed instruction booklet for warfarin

TABLE 14 Details of trials comparing written medicines information versus various other interventions

Trial	n	Patients ^a	Mean age (range) (years)	Male (%)	Trial drug	Nature of interventions	Outcome assessor masked	Randomisation	Concealment	Loss to follow-up
Clark and Bayley, 1972 ¹⁰¹	45	Yes	(21–77)	48.9	Warfarin	Information sheet, information booklet or no intervention	– ^b	– ^b	– ^b	1/45 (2.2%)
Dolinsky et al., 1983 ¹⁰²	271	Yes	– ^b	– ^b	Methyldopa or ampicillin	Short paragraph information, readable information or no intervention	– ^b	– ^b	– ^b	– ^b
Little et al., 1998 ¹⁰³	636	Yes	26.5 (21–31) ^c	0	Oral contraceptive	Summary information leaflet, traditional information or no intervention	Yes	Adequate	Inadequate	113/636 (17.8%)
Vander Stichele et al., 2002, ¹⁰⁴ trial 1	89	Yes	40 (30–50)	0	Cisapride	Beneficial, no beneficial information or no intervention	– ^b	Adequate	– ^b	0/89 (0%)
Vander Stichele et al., 2002, ¹⁰⁴ trial 2	102	Yes	45 (39–51)	0	Itraconazole	Beneficial, no beneficial information or no intervention	– ^b	Adequate	– ^b	0/102 (0%)
Vander Stichele et al., 2002, ¹⁰⁴ trial 3	83	No	58 (52–65)	40.0	Risperidone	Beneficial, no beneficial information or no intervention	– ^b	Adequate	– ^b	0/83 (0%)

^a People currently taking the medicine(s) being studied.^b Not reported or unclear.

therapy with a two-page handout¹⁰¹ (both interventions provided the same information). Dolinsky and colleagues manipulated the presentation in two information sheets: the 'read-organise-attend format' used underlining and short paragraphs, whereas the 'easy-to-read format' used information that was 'readable', such as short, simple sentences.¹⁰² Little and colleagues compared an experimental leaflet with a standard leaflet used in care,¹⁰³ whereas Vander Stichele and colleagues provided the same insert with or without an additional information statement regarding the benefits of taking the medicine.¹⁰⁴

The mean age of subjects, reported in four trials, was 33 years.^{103,104} The age range of participants, reported in five trials, was 21–77 years.^{101,103,104} Less than 6% of subjects, reported in five trials, were male.^{101,103,104} Little and colleagues enrolled only women for an examination of oral contraceptive information¹⁰³ and Vander Stichele and colleagues enrolled only women in two of three trials.¹⁰⁴ The education status of participants was reported in all trials. In general, all trials enrolled participants who had received education to high-school level. Withdrawal from the study, reported in four trials, was less than 1%.^{101,104}

Quality of the included trials

Reporting of the methods overall was poor. Four trials (reported in two papers) described how randomisation was conducted, in both cases judged to be adequate.^{103,104} The trial by Little and colleagues was the only one to report how the randomisation allocation was concealed (by opaque, sealed, numbered envelope, which we judged inadequate) and masking (of the outcome assessor only).¹⁰³ Loss to follow-up, reported in three trials, was just under 12%.^{101,103,104} In the trials by Vander Stichele and colleagues (with immediate follow-up), no participants were lost.¹⁰⁴

Components of the intervention

On average, the trials adopted four content components (range: 3–7) (*Table 15*). The description of the intervention provided by Clark and Bayley was incomplete, detailing only how to use and take the medicine, and they did not provide a full copy of the intervention.¹⁰¹ Little and colleagues only presented information on 'how to take the medicine'.¹⁰³ Vander Stichele and colleagues provided a fuller record of the intervention, detailing all EU-recommended content categories, in addition to providing a copy of the intervention and detailing the theory base.¹⁰⁴ None of the trials was judged to provide information using easy-to-read language or in an accessible layout.

Outcome measures

All trials measured a 'knowledge' outcome. One trial also measured an 'attitudinal' outcome¹⁰⁴ and none measured a 'behavioural' outcome.

Knowledge outcomes. The trials provided conflicting results for the effectiveness of WMI in improving knowledge.

In separate trials of information about cisapride and itraconazole, Vander Stichele and colleagues found medicines users receiving the insert with treatment benefit information were able to answer correctly more questions about their medicine than those who received information without the treatment benefits message and those who did not receive information.¹⁰⁴ Each experimental intervention resulted in significantly higher scores than the control intervention; however, the difference between the two interventions was not statistically significant.

In the third trial, by contrast, adult caregivers of psychiatric patients who received the insert without beneficial information were able to answer one more correct question than those who received the beneficial information insert.¹⁰⁴ Each experimental intervention resulted in significantly higher scores than the control intervention; however, the difference between the two interventions was not statistically significant.

Little and colleagues used a factorial design to compare the effectiveness of an experimental evidence-based summary leaflet, a standard leaflet and no leaflet on women's knowledge of an oral contraceptive, in addition to the effect of participants being asked questions or not by their doctor or nurse.¹⁰³ The outcomes were measured by a questionnaire which had previously been validated for face, content and construct validity.¹⁰³ The results were aggregated over those receiving and not receiving questions. The group receiving the experimental leaflet correctly answered more questions about oral contraceptives compared with the standard leaflet group or no leaflet group (20%).¹⁰³

Clark and Bayley found that a two-page instruction booklet was significantly less effective than a programmed instruction booklet (but more effective than no intervention).¹⁰¹ Dolinsky and colleagues found that information written in the 'read-organise-attend' format (with short sentences underlined) was slightly more effective for increasing recognition of information for ampicillin than the easy-to-read format ('readable'

TABLE 15 Components of interventions in trials comparing written medicines information versus various other interventions

Trial	EU content categories				Presentation			Other	
	What this medicine is used for	Before taking the medicine	How to take the medicine	Possible side-effects	How to store	Easy-to-read language	Attention to layout	Copy of intervention available	Theory/evidence-based
Clark and Bayley, 1972: ¹⁰¹ Intervention 1 and Intervention 2	?	?	✓	?	?	×	×	partial	✓
Dolinsky et al., 1983: ¹⁰² Intervention 1 and Intervention 2	✓	×	✓	✓	×	×	×	✓	✓
Little et al., 1998: ¹⁰³ Intervention 1 and Intervention 2	×	×	✓	×	×	✓	×	✓	×
Vander Stichele et al., 2002, ¹⁰⁴ trial 1: Intervention 1 and Intervention 2	✓	✓	✓	✓	✓	×	×	✓	✓
Vander Stichele et al., 2002, ¹⁰⁴ trial 2: Intervention 1 and Intervention 2	✓	✓	✓	✓	✓	×	×	✓	✓
Vander Stichele et al., 2002, ¹⁰⁴ trial 3: Intervention 1 and Intervention 2	✓	✓	✓	✓	✓	×	×	✓	✓
✓ Provides component; ?; unclear if provides component or not; X, does not provide component.									

information) or no intervention. On the other hand, the easy-to-read format was marginally more effective for increasing recognition of information about methyl dopa.¹⁰² Both differences were not statistically significant, and there was little difference between the results.

Participants in the trial by Dolinsky and colleagues who received no medicines information were more able to apply the information about how to take the study medicine (ampicillin) compared with either of the two groups receiving information.¹⁰² Participants who were taking methyl dopa and received information in the 'read-organise-attend' format were more able to apply the information about how to take the medicine.¹⁰² Again, the results were all non-significant and there was little difference between group outcomes.

Attitudinal outcomes. Participants in the trials by Vander Stichele and colleagues more often agreed that the benefits of taking the medicine were greater than the harms, when given treatment benefit information compared with those who received no treatment benefit information or no information at all. This effect was significantly greater for participants receiving information about cisapride than for those receiving information about itraconazole.¹⁰⁴ In the trial of adult caregivers of psychiatric patients, those who received no information about the medicine (risperidone) more often agreed that the benefits of taking the medicine were greater than the risk, compared with those who received information with the medicine.¹⁰⁴ The difference was even greater between caregivers who received no information and caregivers who received information without the benefits message.¹⁰⁴ This difference was statistically significant.

Behavioural outcomes. No trials comparing WMI against a variety of interventions measured behaviour as an outcome.

Trials comparing written medicines information risk descriptors

Description of included trials

Thirteen trials (reported in eight papers) conducted between 2002 and 2004, including 3801 participants, met the review inclusion criteria (Table 16).^{35,105-111} Two trials enrolled participants who were currently receiving treatment and provided information about a real medicine.^{35,105-111} The remaining trials, which enrolled members of the general public, used information referring to a scenario for a fictitious medicine.¹⁰⁵⁻¹¹⁰

This set of trials is qualitatively distinct from the other trials included in the review because they examined the effect of a single component of the written information, that is, the description of the risk of a side-effect. The majority of these trials were motivated by EU guidance, which defined verbal descriptors for a series of numerical frequency bands of incidence.⁹

The number of subjects per trial ranged from 95 to 976. The mean age of subjects (48 years) was reported in two trials.^{35,111} The age range of participants, reported in 12 trials, was 18-80 years. About 47% of subjects were male, which was reported by all trials except in Berry and colleagues (2004)¹⁰⁹ and in the first trial reported in Berry and colleagues (2002).¹⁰⁵ The ethnic background of participants was not reported in any trials. The participants' education status was reported in all trials except Bergus and colleagues.³⁵ In most trials participants had a range of education experience, from no formal qualification to having a degree, except in one trial, by Berry and colleagues (2002), where all participants were university students.¹⁰⁵ Withdrawal from study, reported in four trials, was less than 1% overall.^{105,107,109,110}

Quality of the included trials

Reporting of the quality of the methods was generally inadequate, and the authors were contacted for further information. Randomisation was judged to have been adequately conducted in seven trials, reported in four papers.^{35,105,108,109} Six trials reported concealment of allocation in a way we considered inadequate.^{105,108,109,111} The remaining trials did not report if concealment was adequately conducted, and the authors did not reply to a missing data request. The intervention provider was adequately masked in six trials,^{105,108,109,111} and it was unclear if the outcome assessor was masked in any other trials. Loss to follow-up, reported by all trials, was less than 1%.¹⁰⁵⁻¹¹¹

Components of the intervention

On average, the trials adopted around three information components (range: 2-5) (Table 17). One trial provided information on more than one of the content categories.^{35,107} Most trials provided a brief written statement relating to side-effects risk descriptor information for a fictitious medicine.¹⁰⁵⁻¹¹⁰ Overall, all trials covered information on 'possible side-effects'. One trial provided a written statement relating to side-effects information for a real medicine.¹¹¹ Four trials presented easy-to-read information.^{35,105-107} Only one trial was theory based.³⁵

TABLE 16 Details of trials comparing written medicines information risk descriptors

Trial	n	Patients ^a	Mean age (range) (years)	Male (%)	Trial drug	Nature of interventions	Outcome assessor masked	Randomisation	Concealment	Loss to follow-up
Bergus <i>et al.</i> , 2002 ³⁵	217	No	39.1	35.0	Aspirin	Compare order of benefit and risk information	— ^b	Adequate	— ^b	— ^b
Berry <i>et al.</i> , 2002, ¹⁰⁵ trial 1	268	No	(18–55)	— ^b	Hypothetical antibiotic	Compare percentage and frequency descriptors	Inadequate	Adequate	Inadequate	— ^b
Berry <i>et al.</i> , 2002, ¹⁰⁵ trial 2	114	No	(18–70)	48.2	Hypothetical antibiotic	Compare verbal and numerical descriptor	Inadequate	Adequate	Inadequate	2/114 (1.8%)
Berry <i>et al.</i> , 2002, ¹⁰⁶ trial 1	976	No	(18–70)	46.1	Hypothetical antibiotic	Compare few and many descriptors	— ^b	— ^b	— ^b	— ^b
Berry <i>et al.</i> , 2002, ¹⁰⁶ trial 2	592	No	(18–70)	47.6	Hypothetical antibiotic	Compare positive, unknown or no descriptors	— ^b	— ^b	— ^b	— ^b
Berry <i>et al.</i> , 2002, ¹⁰⁶ trial 3	515	No	(18–70)	44.7	Hypothetical antibiotic	Compare statements encouraging modes of action	— ^b	— ^b	— ^b	— ^b
Berry <i>et al.</i> , 2003, ¹⁰⁷ trial 1	95	No	(18–60)	47.4	Hypothetical antibiotic	Compare personal or impersonal information	— ^b	— ^b	— ^b	— ^b
Berry <i>et al.</i> , 2003, ¹⁰⁷ trial 2	100	No	(18–60)	39.0	Hypothetical antibiotic	Compare personal or impersonal information	— ^b	— ^b	— ^b	— ^b
Berry <i>et al.</i> , 2003, ¹⁰⁸ trial 1	120	No	(18–80)	45.8	Hypothetical antibiotic	Compare percentage and 'common' descriptors	Inadequate	Adequate	Inadequate	— ^b
Berry <i>et al.</i> , 2003, ¹⁰⁸ trial 2	360	No	(18–75)	53.9	Hypothetical antibiotic	Compare 'common', 'rare', '2%' or '0.02%' descriptors	Inadequate	Adequate	Inadequate	— ^b

continued

TABLE 16 Details of trials comparing written medicines information risk descriptors (cont'd)

Trial	n	Patients ^a	Mean age (range) (years)	Male (%)	Trial drug	Nature of interventions	Outcome assessor masked	Randomisation	Concealment	Loss to follow-up
Berry et al., 2004 ¹⁰⁹	188	No	(18–70)	41.5	Ibuprofen	Compare percentage and 'common' descriptors	Inadequate	Adequate	Inadequate	3/188 (1.6%)
Berry, 2004 ¹¹⁰	136	No	(20–50)	– ^b	Hypothetical antibiotic	Compare self and other information	– ^b	– ^b	– ^b	– ^b
Knapp et al., 2004 ¹¹¹	120	Yes	63.0 (35–74)	63.3	Simvastatin or atorvastatin	Compare verbal and numerical descriptor	Inadequate	Adequate	Inadequate	– ^b

^a People currently taking the medicine(s) being studied.
^b Not reported or unclear.

Outcome measures and results

The trials in this category measured a consistent group of outcomes. Twelve trials measured one or more 'knowledge' outcomes:

- estimate of probability^{105,108}
- estimated likelihood of occurrence^{105,106,109–111}
- judgement of side-effect/health risk.^{107,108–111}

All 13 trials measured one or more 'attitude' outcomes:

- satisfaction with information^{105–111}
- perceived health or side-effect risk^{105–109,111}
- intention to comply with or favour treatment^{35,105–111}
- rating of side-effect severity.^{105,106,108–111}

None of the trials measured a behavioural outcome.

Knowledge outcomes

Estimation of probability/likelihood of a side effect Berry and colleagues presented participants with the information as a written verbal descriptor [as included in the EU Guidance (e.g. common or rare)] and compared it with those given the information as a percentage. The verbal group overestimated (by around 40%) both the probability of occurrence^{105,108} and the judged mean likelihood (as a Likert measure).¹⁰⁸ The differences were statistically significant. One trial found that participants presented with side-effects as a percentage consistently estimated the risk of a side-effect to be higher than those receiving the side-effect as a frequency. The differences in estimation were minimal, and this outcome was not tested for statistical significance.¹⁰⁵ Three trials found that participants greatly overestimated the likelihood of a side-effect occurring (all statistically significant).^{105,110,111} There was a higher estimation when the information was designed for a parent of a child, rather than for an adult¹⁰⁹ when there was no information about control of side-effects¹⁰⁶ and when the information was presented as a verbal descriptor.^{105,110,111}

Judgement of side-effects/health risk Two trials measured participants' judgement of side-effects risk. Berry and colleagues found that participants provided with impersonal information made a significantly greater judgement of side-effect risk compared with those given personal information.¹⁰⁷ In a separate trial, the same group found that individuals presented with the side-effects risk verbally, rather than numerically, judged the risk to be significantly higher.¹⁰⁸ They

also found that participants presented with a risk described as 'common' judged the risk of the side-effects to be more likely than participants given the risk described as 'rare', who in turn judged the risk to be higher than participants receiving one of two numerical values.¹⁰⁸ These were statistically significant differences.

Attitudinal outcomes

Satisfaction with information The trials measuring participants' levels of satisfaction with side-effect information consistently found that participants favoured numerical information over verbal information.^{105,108,110,111} This outcome was replicated in further trials, providing personal information,¹⁰⁷ mild side-effect information,¹⁰⁶ information about the positive benefits of side-effects,¹⁰⁶ encouragement to take the correct dose,¹⁰⁶ when presented in a specific numerical manner (0.02%)¹⁰⁸ and as information aimed at a parent.¹⁰⁹ All these results were statistically significant.

Perceived health or side-effect risk Participants perceived the risk to health of a side-effect to be greater when presented with verbal information,^{105,110,111} information reporting severe side-effects,¹⁰⁶ information presenting unknown benefits of side-effects,¹⁰⁶ no statement on the control of side-effects,¹⁰⁶ when the side-effect was presented in an impersonal manner¹⁰⁷ and as information for the parent of a child.¹⁰⁹ These results were all statistically significant.

Intention to comply with or favour treatment Bergus and colleagues found that individuals who received information about the benefits of taking the medicine before risk information reported a decline in the extent to which they favoured the treatment (measured by a bespoke measure) which was double that of the group who received the benefits information after the risk information (10.9 compared with 5.2, a difference which was statistically significant).³⁵

Trials consistently found that participants who received numerical risk information reported having statistically significant greater intention to take the medicine than those who received verbal descriptors.^{105,108,110,111} Information about mild side-effects,¹⁰⁶ the positive benefits of side-effects,¹⁰⁶ presented as a specific numerical figure (0.02%),¹⁰⁸ presented in a personalised manner¹⁰⁷ and aimed at parents¹⁰⁹ resulted in participants being more likely to report an intention to take the medicine. These differences were all statistically significant.

TABLE 17 Components in trials comparing written medicines information risk descriptors

Trial ^a	EU content categories					Presentation			Other	
	What this medicine is and what it is used for	Before taking the medicine	How to take the medicine	Possible side-effects	How to store	Easy-to-read language	Attention to layout	Copy of intervention available	Theory/ evidence-based	
Bergus <i>et al.</i> , 2002: ³⁵ Intervention 1 and Intervention 2	✓	×	×	✓	×	✓	✓	✓	✓	
Berry <i>et al.</i> , 2002, ¹⁰⁵ trial 1, 2: Intervention 1 and Intervention 2	×	×	×	✓	×	✓	×	✓	×	
Berry <i>et al.</i> , 2002, ¹⁰⁶ trial 1, 2, 3: Intervention 1 and Intervention 2	×	×	×	✓	×	✓	×	✓	×	
Berry <i>et al.</i> , 2003, ¹⁰⁷ trial 1, 2: Intervention 1 and Intervention 2	×	×	×	✓	×	✓	×	✓	×	
Berry <i>et al.</i> , 2003, ¹⁰⁸ trial 1, 2: Intervention 1 and Intervention 2	×	×	×	✓	×	×	×	✓	×	
Berry, 2004: ¹¹⁰ Intervention 1 and Intervention 2	×	×	×	✓	×	×	×	×	×	
Berry <i>et al.</i> , 2004: ¹⁰⁹ Intervention 1 and Intervention 2	×	×	×	✓	×	?	?	✓	×	
Knapp <i>et al.</i> , 2004: ¹¹¹ Intervention 1 and Intervention 2	×	×	×	✓	×	×	×	✓	×	

✓, Provides component; ?, unclear if provides component or not; X, does not provide component.
^a These trials used more than one WMI, which were compared against each other.

Rating of side-effect severity Participants who received verbal descriptor information judged their anticipated risk of a side-effect to be significantly greater than those who received numerical information in four trials.^{105,108,110,111} A similar finding was made for participants who received information about severe side-effects¹⁰⁶ and information aimed at parents of children.¹⁰⁹ Once more, all results were statistically significant.

Behavioural outcomes. No trials comparing written medicines information for risk descriptors measured behaviour as an outcome.

Summary of the findings

This section combines the results by their outcomes, that is, knowledge, attitudes and behaviour, in order to provide an overall summary of the effectiveness of WMI.

Knowledge

The majority of trials used an exclusive outcome to measure knowledge. The trial evidence showed that giving information about medicines more often than not did not increase participants' knowledge about medicines. Giving information about medicines rarely increased recognition or recall of side-effects associated with the medicine. The way in which side-effect risk information was conveyed had an impact on knowledge about medicines. In particular, presenting risk information numerically rather than using verbal descriptors ensured a more accurate estimation of the likelihood and probability of a side-effect occurring.

Thirty-six trials (reported in 28 papers) recorded a knowledge-based measure as an outcome (see Appendix 6).^{78-83,86-89,91-94,97,98,101-111} We further partitioned the trials by the specific knowledge outcomes they measured. There were four main knowledge outcomes examined, described below.

Knowledge about the medicine or recall of medicines information

Twenty trials measured knowledge, or recall of, information about the study medicine.^{78-82,86-91,93,94,97,101-104} Six trials reported a statistically significant difference showing that written medicines information was effective for improving participants' knowledge about the medicine or recall of the medicines information.^{78,80,87,88,91,94}

Recognition/recall of side-effects

Four trials measured participants' recognition or recall of side-effects. Two found that providing

written information was significantly more effective.^{92,98} One trial found that no information was more effective for recognition or recall of side-effects;⁹⁰ and one trial reported no difference between information and control groups.⁹⁸

Estimation of probability/likelihood of a side-effect

Two trials found that verbal side-effect descriptors produced a statistically significant overestimation of the probability and judged mean likelihood of occurrence.^{105,108} The likelihood of a side-effect occurring was overestimated when the information was designed for a parent of a child,¹⁰⁹ when there was no information about control of side-effects¹⁰⁶ and when the information was presented verbally.^{105,110,111} These differences were statistically significant.

Judgement of side-effects/health risk

The evidence showed that those presented with impersonal information made a higher estimate of the risk of the side-effect¹⁰⁷ and individuals provided with side-effects risk as verbal descriptors judged the risk of side-effect to be higher.¹⁰⁸ These differences were all statistically significant.

Other trials measuring knowledge

Two trials (reported in one paper) found that giving benefits information about the medicine resulted in a greater recognition of the benefits over the harms of taking medicines,¹⁰⁴ and one trial found that caregivers of medicine users receiving no written information had greater recognition of the benefits.¹⁰⁴ One trial found WMI was less effective than programmed instruction, but more effective than nothing. These differences were statistically significant.¹⁰¹

Summary

- These trials on the whole were of poor methodological quality and no strong claims can be made about their findings.
- The trials measuring knowledge used unique outcome measures and cannot be combined by meta-analysis.
- Giving information about medicines does not guarantee increased knowledge about medicines.
- Presenting risk information numerically rather than by verbal descriptors can ensure a more accurate estimation of the probability and likelihood of a side-effect occurring.

Attitudes

The majority of trials defined attitudes in a unique way and used an exclusive outcome measure. The

trial evidence showed that the way side-effect risk information was described had an impact on participants' attitudes towards medicines. In particular, presenting risk information numerically rather than verbally resulted in greater reported satisfaction with the information and a greater intention to comply with the medicine instructions. On the other hand, presenting risk information by verbal descriptor rather than numerically increased the estimate of a risk to health from the medicine and the estimated severity of the side-effect(s).

Nineteen trials recorded an attitude measure as an outcome (see Appendix 6).^{34,35,79,88,95,96,100,105-111} The trials have been subdivided by the specific attitudes they measured.

Satisfaction with information

The trials found that using numerical risk descriptors led to greater satisfaction with medicines information.^{105,108,109,111} This outcome was replicated for personal information,¹⁰⁷ mild side-effect information,¹⁰⁶ information about the positive benefits of side-effects,¹⁰⁶ encouragement to take the correct dose,¹⁰⁶ information presented in a specific numerical manner (0.02%)¹⁰⁸ and information aimed at a parent.¹⁰⁹ All differences were statistically significant. One further trial found that those receiving written information felt sufficient information had been given, felt the information was 'clear' and felt the information did not need to be improved.⁸⁸

Perceived health or side-effect risk

Participants perceived a greater risk to health of a side-effect when presented with verbal information,^{105,110,111} severe side-effects information,¹⁰⁶ the unknown benefits of side-effects,¹⁰⁶ no statement on the control of side-effects,¹⁰⁶ side-effect information in an impersonal manner¹⁰⁷ and information for a parent.¹⁰⁹ These differences were all statistically significant.

Intention to comply with or favour treatment

Four trials found that participants reported a significantly greater intention to take a medicine when they received numerical rather than verbal descriptor risk information.^{105,108,110,111} This effect was seen in trials in a variety of contexts, including mild side-effects,¹⁰⁶ the positive benefits of side-effects,¹⁰⁶ information presented as a specific numerical figure (0.02%),¹⁰⁸ information that was personalised¹⁰⁷ and that was aimed at parents.¹⁰⁹ One trial found that individuals who received information about the benefits of a medicine before its harmful effects reported a statistically

significant decline in the extent to which they favoured the treatment.³⁵

Rating of side-effect severity

Three trials found the estimated severity of side-effects to be significantly greater when verbal rather than numerical risk descriptors were used.^{105,108,110} The estimated severity of side-effects was significantly greater for information about severe side-effects¹⁰⁶ and information aimed at parents of children.¹⁰⁹

Other trials measuring attitudes

Two trials (reported in one paper) found that medicine users receiving information on the benefits of a medicine saw the benefits of taking the medicine as greater than its harms, compared with those receiving information without benefit content or no information.¹⁰⁴ In a third trial (reported in the same paper), caregivers more often agreed that the benefits were greater when they received no information.¹⁰⁴ The differences were statistically significant between those receiving information with or without benefit content, but not between either of the interventions and the control.

Participants who received seven items of normally worded information judged the scope of topic information to be 'about right', whereas those given 'normal' wording information judged the complexity of the information to be 'about right'.⁹⁵ Both results were statistically significant.⁹⁵ On the other hand, one trial found information to be more positively valued when it used complex phrasing and jargonised language.⁹⁶

Summary

- The trials measuring attitudes used unique outcome measures and cannot be combined by meta-analysis.
- Medicine users are more satisfied with risk descriptor information presented numerically.
- Medicine users perceive the risk of a side-effect to be greater when risk descriptor information is presented verbally.
- Medicine users have a greater intention to take the medicine when presented with numerical risk descriptor information.
- Medicine users estimate the severity of a side-effect to be greater when presented with verbal risk descriptor information.

Behaviour

The majority of trials measuring a behavioural outcome looked at adherence to the medicine, whereas some focused on an aspect of behaviour

exclusive to that trial (e.g. anxiety felt when taking the medicine). The provision of WMI alone was found to be ineffective at improving adherence to treatment instructions in long-term therapy or to increasing reporting of side-effects.

Nine trials (25.0%) measured behaviour as an outcome (see Appendix 6).^{34,78,82-85,88,98,99} We further partitioned the trials by the specific behaviours they measured.

Adherence to treatment recommendations

Four trials measured adherence to treatment recommendations.^{34,78,84,85} One found that participants receiving WMI more often took the medicine as instructed (this difference was statistically significant).⁷⁸ By contrast, one trial found significantly less adherence to treatment among those receiving information.⁸⁵ One well-powered trial with 523 participants and 3 months' follow-up found no significant difference in adherence between those given information and those not.⁸⁴

Side-effect reporting

Four trials measured side-effect reporting as the outcome.^{82,83,85,98} One trial found that written information had a small but statistically significant effect on reporting.⁸⁵

Other trials measuring behaviour

One trial reported that more participants receiving WMI reduced their anxiety about taking the medicine compared with those receiving spoken information alone.⁸⁸

Summary

- The trials measuring behavioural outcomes used unique measures and cannot be combined by meta-analysis.
- Providing WMI alone has not been shown to improve adherence to treatment instructions in long-term therapy or change the reporting of side-effects.

Responses from health information and information design key informants

The responses from the six health information key informants produced a list of almost exclusively primary research papers. It was concluded that the planned process for identifying best practice in health information, as applicable to WMI, would not be possible using these outputs. It was therefore decided not to analyse them formally,

but to make reference to those papers which were most relevant in the Discussion in Chapter 4.

Information design key informants

Responses were received from five of the six informants: Dickinson (DD), Hartley (JH), Parkinson (BP), van de Waarde (KW) and Wright (PW). Cited references included papers, editorials and books.

- Some nominated more than three texts, and most included texts which had also been nominated by others.
- Some of the nominations were for large text books and informants were then asked to nominate the relevant chapter(s).
- Where multiple similar reviews by the same author were nominated, the most complete and recent text was included.

The result was that nine nominated texts were reviewed, three of which were found not to address the stated focus of the review, that is, **best practice in information design issues which are generic, such as leaflet design, print size and use of bullet points**. Their focus was rather on the theoretical basis for information design. The full list of texts cited by key informants can be found in Appendix 8.

Key texts nominated and analysed

See *Table 18*.

1. *Top tips for user-friendly patient information*¹¹²
Context and standpoint:
 - (a) Author: **David Dickinson** is founder of the Consumption consultancy, which works with the pharmaceutical industry and others to design and test leaflets and other health communication materials. He is a former editor of *Health Which?* magazine and was a co-founder of *Ask About Medicines Week*.
 - (b) Instructional and **medicines** focused: web-based 10 point guide (containing the equivalent of 1.5 pages of A4 text).
 - (c) Aimed at non-specialist writers of information.
2. *The plain English guide to writing medical information*¹¹³
Context and standpoint:
 - (a) Author: **The Plain English Campaign** (PEC) describes itself as an independent pressure group fighting for public information to be written in plain English. Its work is funded by commercial services which involve the editing and testing of information.

TABLE 18 Key texts nominated and analysed

Text	Author	Nominated by
<i>Top tips for user-friendly patient information</i> ¹¹² http://www.pecmi.org (accessed 28 November 2005)	Dickinson D	DD
<i>The plain English guide to writing medical information</i> ¹¹³ http://www.plainenglish.co.uk/medicalguide.html (accessed 28 November 2005)	Plain English Campaign	DD
<i>Writing about medicines for people</i> ¹¹⁴	Sless D, Wiseman R	DD
<i>Dynamics in document design. Ch. 5: Seeing the text: the role of typography and space</i> ¹¹⁵	Schrivier, KA	PW, JH
<i>Handbook of applied cognition. Ch. 23: Designing healthcare advice for the public</i> ²⁰	Wright P	PW
<i>Handbook of research on educational communications and technology. Ch. 34: Designing instructional and informational text</i> ¹¹⁶	Hartley J	JH

- (b) Instructional and **health** focused: “*This guide gives you an idea of how the plain English approach can make your notices, letters and medical information clearer*”.
- (c) Aimed at people working in the “*Health Service; an NHS Trust; or a company in the health sector*”.
3. *Writing about medicines for people*¹¹⁴
Context and standpoint:
- (a) Author: Professor **David Sless** is Director of the Communications Research Institute of Australia and Professor in Science Communication at the Australian National University and Visiting Research Fellow at Coventry University, UK.
- (b) Instructional and medicines focused: “*A set of procedures for writing, testing, implementing and monitoring Consumer Medicines Information (CMI)*”.
- (c) Aimed at “*everyone with an interest in CMI, but most particularly for people who write CMI for pharmaceutical products*”.
4. *Dynamics in document design*¹¹⁵
Context and standpoint:
- (a) Author: Professor **Karen Schrivier** is a US-based teacher, researcher and consultant in information design.
- (b) Technical and academic with a general focus: Book is subtitled “*creating texts for readers*”.
- (c) Aimed at “*Writers and graphic designers*”.
5. *Handbook of applied cognition*²⁰
Context and standpoint:
- (a) Author: **Patricia Wright** is a cognitive psychologist at Cardiff University who has been involved in the world of information design for more than 25 years.
- (b) Instructional from an academic perspective with a health focus: special focus on

“*procedural instructions and ... informed choice*”.

- (c) Book aimed at “*applied researchers*”.
6. *Handbook of research on educational communications and technology*¹¹⁶
Context and standpoint:
- (a) Author: Professor **James Hartley** is a psychologist whose work has included a focus on textbook design.
- (b) Instructional with a **general** focus: aims to “*summarize the literature and explore research methods and models*”.
- (c) Book aimed at “*academic researchers*”.

Content analysis of six texts

Table 19 shows the six texts and what they say about the following aspects of information design.

Words

Words (mentioned by 4/6 texts)

Use easy to understand, everyday language and short familiar words. Aim for one or two syllables and concrete words rather than abstractions. One text suggests using ‘it’ sometimes, rather than repeating the name of the medicine every time.

Jargon (4)

Minimise jargon and provide an explanation where it is used (either where it occurs or as a glossary).

Tone (2)

Use a conversational voice, with ‘we’ and ‘you’, rather than the name of the organisation and ‘the patient’.

Voice (4)

Use the active voice in most cases and the imperative voice for instructions. Do not use the passive voice.

TABLE 19 Content analysis of the six texts

Words	Dickinson	PEC	Sless	Schrivier	Wright	Hartley
Choice of words	Use short everyday words: aim for nothing over one or two syllables	Big words, foreign phrases, bursts of Latin and so on usually confuse people. Use everyday words	Use language that people will understand. Say 'it' sometimes, instead of the medicine's name	Not reported	Not reported	It is easier to understand short familiar words. Concrete words and phrases are shorter and clearer than abstract ones
Jargon	Cut back medical jargon	Be prepared to explain your jargon words and acronyms – will your audience know them?	Use a glossary	Not reported	Healthcare advice may use medical terms that are not familiar to readers	Not reported
Tone	Be conversational/ personal: 'you may find' is better than 'patients may find'	Any organisation ... can become 'we'. Then the better than 'customer', or 'patient' simply becomes 'you'	Not reported	Not reported	Not reported	Not reported
Voice	Use active language, not passive: 'take two a day', not 'two tablets to be taken daily'	The active is shorter and clearer; the passive can be longer and sometimes confusing. Try to write 90% in the active	Write instructions as commands – in imperative voice. Put verbs at beginning of sentences. Avoid using the passive voice	Not reported	Not reported	Text is easier to understand with active rather than passive voice
Positive phrasing	Not reported	Not reported	Where possible, use positive not negative instructions (latter used when want to not do something)	Not reported	Not reported	Positive terms better than negative ones (more than not less than)

continued

TABLE 19 Content analysis of the six texts (cont'd)

Words	Dickinson	PEC	Sless	Schrivver	Wright	Hartley
Sentence length	Use short sentences	Good average length is 15–20 words. Use shorter ones for 'punch'. Longer ones should not have more than 3 items of information, or readers lose track	Use simple grammatical structures without embedded clauses. Punctuate lightly. One item of information per sentence is best. Keep sentences to 20 words or fewer	Not reported	Not reported	<ul style="list-style-type: none"> Less than 20 words are probably fine and 20–30 words probably satisfactory 30–40 words suspect 40+ almost certainly benefit from rewriting <p>The more subordinate clauses, the more difficult understanding</p>
Typeface	Not reported	Not reported	Not reported	Not reported	Bold text more legible than normal text	Stick to conventional and familiar typefaces
Size	Not reported	Not reported	Not reported	Use typeface with large x height for people with poor vision; x height as important as print size	Legibility enhanced with type size, at least 12–14 point	<ul style="list-style-type: none"> 6–8 point is too small for most people to read with ease 12–14 point more appropriate for older readers
Serif or sans serif font	Not reported	Not reported	Not reported	No consensus – equal preference from readers but serif better for continuous text. Sans serif gives better distinction and better hierarchy of text. <ul style="list-style-type: none"> One option is serif for body text and sans for headings One study found sans serif preferred by readers for instructional text 	Not reported	No clear guidance from research. Some suggest serif for body text and sans serif for headings. Others suggest that sans serif better for older readers

continued

TABLE 19 Content analysis of the six texts (cont'd)

Words	Dickinson	PEC	Sless	Schriner	Wright	Hartley
Be careful with colour	Black text is reliable. 10 people are colour blind – don't use red warnings (they appear grey for some). Print in coloured boxes is also hard to read	Not reported	Not reported	Not reported	Low contrast with background colour affects legibility	Readers like additional colour but it needs to be used sparingly and consistently if not to confuse. Some colours stand out more than others, so unhelpful to use a range of colours on same page. Black on white or yellow preferable
Lines						
Line length	Long lines ... make reading harder	Not reported	Not reported	>70 characters make readers weary. If too long or short, then reading is slowed. Aim for 40–70 characters (8–12 words)	Not reported	Not reported
Space between lines	Not reported	Not reported	Not reported	Readers dislike too little or too much leading. People read faster with 9–11 point, needs 1–3 points of leading. 12 point needs 2–4 points of leading	Not reported	Predetermined increments of line space can be used consistently to separate out components of the text. Readers prefer long paragraphs set in more open manner (new lines for each sentence) Short chapters and short paras make text easier to read. Consistent spacing helps reader to grasp organisation of document and see more easily personally relevant pieces of information

continued

TABLE 19 Content analysis of the six texts (cont'd)

Words	Dickinson	PEC	Sless	Schrivver	Wright	Hartley
Justification	Not reported	Not reported	Not reported	Research inconsistent: some studies say justified text hard to comprehend quickly. Readers may perceive severe rectangular look as formal, distant and unapproachable	Ragged right helps older readers when line length short	Some evidence that unjustified more helpful for less able readers
Word wrapping	Not reported	Not reported	Not reported	Not reported	Not reported	Text should not be wrapped around a figure or printed over it
Structure Organisation	Impose order: before, during and after taking medicines is a useful and logical order which reflects people's own experience	Not reported	Not reported	Not reported	Readers search for an answer using their understanding of the document structure to skip to where answer to be found	Readers can more easily follow a sequence where events match the temporal order in which they occur
Page breaks	Not reported	Not reported	Try not to let page or column breaks split up sections (if they do, put 'continued')	Not reported	Not reported	Not reported
White space	Not reported	Use plenty of white space and don't cloud the message with watermarking	Not reported	Blank space around paras and between columns increases legibility. Text with generous amounts of blank space may attract reader and hold attention longer. Aim for 50%	White space between lines can be influential in promoting ease of reading	Clarity of the text can be enhanced by rational and consistent use of 'white space'

continued

TABLE 19 Content analysis of the six texts (cont'd)

Words	Dickinson	PEC	Sless	Schrivver	Wright	Hartley
Table of contents	Not reported	Not reported	Helpful if long or complex leaflet	Not reported	Not reported	Not reported
Headings	Make a hierarchy: more than one layer of headings helps emphasis	Not reported	<p>Easy accessibility requires headings which:</p> <ul style="list-style-type: none"> • Are carefully chosen and ordered. • Follow sequence of actions/events. • Short, so easy to layout and read (preferred to question headings). • Try to keep on single line 	Not reported	Not reported	<p>Titles should describe content in fewest words possible. Concrete titles may be better than abstract ones.</p> <p>Evidence equivocal on question headings</p>
Numbered lists	Not reported	Not reported	For a series of instructions to be followed, use numbers	Not reported	Not reported	Numbered paragraphs can make clearer the structure and organisation of a piece of text
Bullet points	Use bullet points to help organise text	If you have a lot of information to convey, make it easier for the reader by breaking it up into logical 'stepping stones'	<p>Lists of information can be put in a dot point structure. Introduce with a colon and put single full stop at the end (don't use semicolons after each dot point).</p> <p>Never more than 1 sentence per dot and not more than 9 items (simple dot points) or 5 items (complex dot points)</p>	Not reported	Replacing prose paragraphs with list of steps can be helpful with procedural information	<p>Readers prefer text with lists or numbered items spaced out and separated.</p> <p>Bullets better than numbers when points of equal value</p>

continued

TABLE 19 Content analysis of the six texts (cont'd)

Words	Dickinson	PEC	Sless	Schrivver	Wright	Hartley
Emphasis	Use bold for emphasis. Capital letters ... make[s] reading harder	Block capitals hard to read ... use lower case bold. Avoid italics. Underlining can be distracting, making the text harder to read	Not reported	Capitals slow reading speed. Use bold for extra emphasis. Reverse type calls attention but use cautiously (may make rest of text look unimportant) Continuous prose in italics is hard to read and slows reading	Long passages in capitals slow readers down	Words in capitals contain less distinctive information per unit of space. Capitals for main headings may be OK. Continuous italics believed harder to read
Attitude and meaning	Think of audience, not yourself. Put yourself in a user's shoes. Think what the user needs to know. Give practical, specific advice that can be followed. Instruct, then explain: let users know what to do. People find it easier to follow instructions if they know why	Be as straightforward as possible. Imagine you are speaking to someone, and write in that more relaxed way	Use explanations to help people understand the reasons for particular instructions. Where possible, use positive rather than negative instructions (latter used when you want people not to do something)	Not reported	Not reported	Positive terms better than negative ones (more than, not less than), so avoid negatives
Pictures and graphics	Use pictures/graphics with care. Make sure you know why an illustration is there, and that you know it works. They can help to explain, or cause confusion	Not reported	Don't use unfamiliar symbols	Not reported	Illustrations enhance ... procedural instructions but ... 'not proven' in usefulness of adding illustrations to written material for patients. <ul style="list-style-type: none"> • Illustrations can vary greatly in style and clarity and way linked to text can be crucial. • Visual tokens can break text into smaller chunks and may make page less daunting. • They risk trivialising serious subject. • Some may find illustration childish or patronising not amusing. 	Not reported

Positive phrasing (2)

Put instructions in a positive way – unless telling people not to do something.

Sentence length (4)

Use short sentences averaging 15–20 words. Use simple grammar – one item of information per sentence is best (do not go above three items of information per sentence). Use short sentences to emphasise a point.

Type**Typeface** (2)

Use conventional, familiar typefaces; bold fonts are most legible.

Serif or sans serif (2)

There is some support for the use of sans serif (e.g. Arial, Helvetica, Gill Sans) for headings and serif (e.g. Times, Palatino, Baskerville) for continuous text. However, there is no consensus on this.

Type size (3)

Use 12–14 point to maximise legibility; that is particularly useful for older readers.

Colour (3)

Colour can attract readers to the text, but use it sparingly. Black type on white or yellow maximises readability. Do not use red text alone to attract attention, as it appears grey to some readers.

Lines**Line length** (2)

Long lines make reading harder, but too short a line also slows reading. Aim for 40–70 characters (8–12 words).

Line spacing (2)

Paragraph spaces are useful to separate components of the text, making short paragraphs which are easier to read. The space between lines needs attention too (also called **leading**).

Justification (3)

Text which is justified (spacing between words adjusted so that the lines end evenly at the right margin) may hinder ease of reading and can make a document look less approachable. Left justification is preferred (also called **ranged left** or **ragged right**).

Word wrapping (1)

Do not wrap words around a graphic or print over a graphic.

Layout**Organisation** (3)

Document structure is important in helping readers find information. Following the sequence ‘before, during and after’ can be helpful.

Page breaks (1)

If possible, do not let page or column breaks split up discrete sections.

White space (4)

Text clarity is improved by including plenty of white space on the page (ideally taking up 50% of the page).

Table of contents (1)

This is useful for long leaflets.

Headings (3)

Short, concrete headings help accessibility, with clear different levels of headings helping emphasis. Keep on a single line. Question headings may not be useful.

Numbered lists (2)

Can be useful for a sequence of section headings or for a list of instructions.

Bullet points (5)

These help to organise text, by breaking it up into a list of steps or points. Use instead of a numbered list when the points are of equal value and not sequential.

Emphasis (5)

Bold text is effective for emphasis; capital letters make reading harder (although capitals in headings may be satisfactory). Section headings in reverse type stand out, at some cost in legibility. Italics and underlining are thought to make reading harder.

Pictures and graphics (3)

Use with care. Have a clear idea of why the illustration is there. Pictures or diagrams may enhance procedural instructions, but their effect is not clear when simply added to text. ‘Visual tokens’ can break up text and may make documents look less daunting. Do not use unfamiliar symbols. Childish illustrations may be patronising.

Attitude and meaning (4)

A relaxed and positive writing style can be useful; put yourself in the reader’s position and be straightforward. Be practical and specific and say why something is important or should be done.

Workshop two

Participants

Invitations were sent to the same individuals and organisations that had attended the previous workshop. Of the nine consumers who attended the previous workshop, only one was unable to attend Workshop two. While the same national patient organisations from workshop one were represented in the second workshop, in two cases it was by a different individual. All collaborators who attended the first workshop also attended the second workshop, apart from one organisation which sent an alternate. In this section, the commonly occurring responses in each of the four activities are presented.

Expectations of review findings

The primary purpose of this activity was to identify participants' expectations of the outcomes of the review. They outlined a varied set of wishes and expectations. They spoke about wanting evidence:

- supporting the importance of the presentation and packaging of the information leaflet, e.g. to warn against small type print
- on how to make the information simpler, e.g. for risk of side-effects
- to show the importance of focusing more on the positive aspects of information rather than the negative aspects.

Related to this was a hope that the research would provide some principles to ensure good quality. They also hoped that there would be evidence to indicate how information could be made more specific to the individual user, for example, the need for personalisation of the information to the individual, and how it related to their illness, rather than the various diseases for which the medicine can be used. Related to this was the hope that information could be based on the experiences of people taking the medicine.

Responses also indicated expectations about a broader set of issues. Some proposed that the motivation underlying the development of leaflets by pharmaceutical companies was primarily as a legal defence, and anticipated findings on this. In turn, it was hoped that the review would then act as guidance to impact on future information development by industry. In addition, participants hoped that there would be research on other sources of information, not just written information, with some of the attendees stating a need to research how NHS Direct and the

Medicines Guides deal with medicines information. Finally, attendees spoke about the need for the information to mention alternative treatments to medicines, and they hoped the research would address this.

Response to the role and value review findings

Following a 15-minute presentation outlining the outcomes of the role and value review, participants' responses focused largely on their own views on the role and value of medicines leaflets, rather than an evaluation of the review findings. Participants indicated that they see the role of the leaflet as being to provide understandable information. Added to this, they see the information as being empowering, given that health can be jeopardised if medicines users are not well informed. It was suggested that the content of leaflets would be valued if they contained information based on the experience of other medicine users. Furthermore, there was a need for balanced informing of the side-effects. Some questioned why patients should have to develop expert medicines knowledge (from the information) in the first place, as they feel they should be given this knowledge from their GP or consultant.

The attendees spoke of large gaps between users' and professionals' wants and needs from written medicines information. Allied to this were the differences between personal and generic information, with the users wanting individual, personalised information, given the very different contexts in which particular medicines are prescribed. Some stakeholders were surprised that the research had not focused on what patients do not value, such as the use of overly technical language or small print.

The scope of the discussion was not confined to the leaflet *per se*. Attendees talked about the wider context of medicines information, for example, the relationship between written and spoken information and the role of the pharmacist in giving medicines information. They again cast doubt on the role of pharmaceutical companies and the conflict of interests that may exist. They suggested that an independent body should write the leaflets and that contact details of patient organisations should accompany leaflets.

Overall, rather than a detailed evaluation of the role and value findings, these discussions provide information on role and value issues that should be addressed by future research.

Response to the effectiveness review findings

There was a general consensus that the effectiveness review outcomes were disappointing. Attendees were in agreement that the previous research was generally of poor quality, with limited results. They were surprised that there were so few useful findings and that so many studies were rejected from the review because they were not of sufficient quality. There was a general consensus that more research was needed and some spoke of the possibility of using a study design other than the RCT (to account for the context relating to taking the medicine). Looking at the findings of the role and value, and the effectiveness reviews in tandem, some participants were surprised that medicines information was found to be valued, yet on the whole not found to be effective, and asked why the information should be given at all under these circumstances.

In response to trials measuring compliance as an outcome, some respondents queried this approach. Also, the experiences of medicines users were not always consistent with the review findings. For example, when talking about one trial which found that participants' anxiety about taking medicines increased after receiving written information, they said (in contradiction to the conclusions of the trial) that this was a good thing and reflected appropriate concerns about using medicines. This group also disagreed with the evidence presented by providing personal examples of information increasing their knowledge of side-effects, when one trial found that the opposite was the case. A general theme which arose throughout the discussions was that stakeholders did not apparently make the same distinctions between written and spoken medicines information as had been made in the trials.

The attendees spoke of the presentation of the information as being of great importance to them. They stated that if side-effect information was presented in better ways, they might feel more reassured about taking their medicines. They also agreed with the results of the trials which favoured side-effects risk being communicated numerically rather than verbally. They favoured receiving information on both long- and short-term side-effects.

The discussions highlighted a failure of research to address issues concerning personal and individual information and the importance of this when thinking about side-effects. Participants explained that this is important because the

situation regarding medicines information changes over time. For example, they argued that there were significant differences between taking a short-term course of a medicine and long-term usage, but that this was not covered by information leaflets. Also, longer term usage increases the chances of taking multiple medicines, which, in turn, presents new concerns not covered by existing leaflets. Some participants suggested that personalised information might overcome some of these problems and that there was an urgent need for research to investigate these ideas further.

Views about what should happen now

This activity provided respondents with an opportunity to recommend priorities for future research and to make other general recommendations. As can be seen, this process had already begun in the discussions earlier in the day. Attendees' responses outlined the need for improving the standards and increasing the scope of research and suggested that future research might also adopt non-RCT study designs. In addition, they made suggestions about practical changes which could be made to the information. It was hoped that the design and considered format of the leaflet interventions in the future could be consistent and simple and considered that research was needed to achieve this. Some considered whether a tool could be developed for assessing the quality of the interventions in future studies. Some attendees felt that understanding, rather than knowledge, was a crucial outcome on which to focus research. It was also noted that our review had not incorporated non-English language research, and it was felt it was important to have this in a future review.

The attendees hoped that future research would have greater scope and gave many examples. In particular they suggested further research was needed on:

- the social context in relation to information
- the content of risk information presentation
- the timing of information provision
- the Internet as a source of medicines information
- the role of doctor and pharmacist in delivery of medicines information.

Many practical considerations and concerns about written medicines information were expressed by the attendees, highlighting:

- the need for condition-specific and personalised information

- the importance of recognising that informing about medicines is a two-way process
- that information about side-effects should be fed back to manufacturers
- that written information in its present state was not enough
- the need for up-to-date information
- the need for distinct information for particular ethnic groups.

In addition, participants were given four open questions about the workshop. In response to a question on which aspects of the workshop they most enjoyed, participants' responses included hearing about the findings, the opportunities to exchange ideas and discussing the findings with

peers, feeling valued, hearing the views of the other stakeholders and the general atmosphere. Responses to the second question, asking which aspects of the workshop they least enjoyed, included travelling time and some disappointment with the research studies reviewed (most individuals left this blank). There was only one response to a question asking how the workshop could be improved – knowing who was on the other tables. Finally, in response to the question inviting any further comments, participants generally reinforced the very positive views they had about the workshop and the potential that it had for breaking down barriers between professionals and users.

Chapter 4

Discussion

The discussion is presented from the perspective of the four strands of the review:

- role and value review
- effectiveness review
- information design key informants review
- stakeholder workshops.

These analyses are then synthesised in the final part of the discussion:

- synthesis of findings.

Role and value of written medicines information

Overview of main findings

The role and value strand of the systematic review looked at research on how patients and professionals value written patient information on medicines and the role that they feel it plays in medicines use. The research showed that patients valued written information which was tailored to their circumstances and which set information within the context of the illness that the medicine was being used to treat. Most patients wanted to know about any adverse effects that could arise from taking a medicine. Patients used written information in a variety of ways. It could be used to help decision-making, both with initial decisions about whether to take a medicine or not and (once taking a medicine) with ongoing decisions about the management of medicines, interpreting symptoms and whether medical advice was needed. Patients did not want written information to be a substitute for spoken information from their doctor. While not everyone wanted written information, those who did wanted sufficient detail to meet their need. Health professionals generally thought that written information for patients should be brief and simple. The main uses of written information, from a professional perspective, appeared to be to increase compliance, to save time in the consultation and to provide evidence of information giving should there subsequently be a legal dispute with a patient.

Context and limitations of the studies

The researchers of the studies included in the role and value strand of our review had different ways of seeing and understanding patients and their need for written information. In her critique of research into the use of written information for patients, Dixon-Woods identified two distinct discourses:¹¹⁷ “the ‘**patient education**’ discourse, characterised by its interest in outcomes that have been defined as useful from a biomedical perspective, and the ‘**patient empowerment**’ discourse”. The two discourses expose different motivations underlying the provisions of written information for patients. Within the ‘patient education’ discourse, information is seen as a way of compensating for patient inadequacies such as poor memory and limited understanding. It also relates to changing patient knowledge, attitudes and behaviour in line with a professional agenda, including compliance with treatment. The eight studies grouped under the heading: ‘The uninformed patient and certainty of medical knowledge’ had elements of a patient education discourse. On the other hand, writers of the seven studies grouped under ‘The informed, involved patient – professionals do not have all the answers’ used largely a patient empowerment discourse, viewing information as an entitlement, necessary for patients to make informed choices about treatment. The remaining 12 studies which were carried out in response to ‘policy initiatives’ were mixed in terms of the discourse they followed.

The research arose from the context of the way the researcher understood the world to be. This shaped their research objectives and aspirations about how the research might impact on practice. For example, Dodds and King started their paper by talking of the role of the pharmacist in improving compliance.⁶⁷ A need to improve compliance and the role of information in achieving it are taken to be self-evident. This is in contrast to Coulter and colleagues’ opening remarks concerning the desirability of incorporating patient preferences into clinical decisions and the role of written information in assisting shared decision-making.⁷¹

Research context

Twelve of the 27 studies were surveys. For many it was unclear whether a content setting phase had been included to develop the questionnaire. Rather, the questions reflected the concerns and priorities of the researcher. However, qualitative research should allow participants to set the agenda to some extent and talk about what is important to them. Some of the differences in the study findings can be explained as a consequence of the method. For example, written information being secondary to spoken emerged strongly in qualitative studies but less so in quantitative surveys. In Dodds and King's study about short-term antibiotic use, the questionnaire comprised seven questions, the last of which asked if research participants would rather be told about their medicine instead of being given a leaflet.⁶⁷ They could choose between 'yes', 'no' and 'don't know'. About 33% said they preferred to be told, 54% said a leaflet and 13% were unsure. This question came after participants had already said how interesting and useful they found the leaflets and, in order to be consistent, may have selected the leaflet option. In contrast, the participants in Raynor and colleagues' focus group, which was set up to consider written information, only talked about written information when prompted by the researcher.⁷⁶ There was also evidence that how participants anticipated they would use and value written information in hypothetical studies was different from what happened when faced with an actual experience. Six studies were both quantitative and hypothetical. Here the findings were both idealised and simplistic. For example, in Mottram and Reed's study, where people were stopped at random in a shopping centre and shown a medicines leaflet, only 6% of patients thought that the provision of information on side-effects would worry them.⁶⁹ Apart from not knowing if they would still feel the same way when actually prescribed a particular medicine for a specific illness, we also do not know what they meant by 'worry'. Here, worry was a researcher-defined concept. As one of Koo and colleagues' respondents showed, worry about a drug may come from a prior bad experience and act as a driver for the person to read up about a medicine.⁶⁰ Thus the context of the research influenced the findings.

Structured interviews using closed or precoded questions give limited opportunity for patients to introduce spontaneously responses that extended beyond the researchers' *a priori* ideas and expectations. Vander Stichele and colleagues had a precoded question in their survey about people's

motives for reading a medicine leaflet.⁶⁵ There were four predefined motives, one of which was 'to be able to comply with therapy'. The respondents had no chance either to give a reason not included in the researchers' defined set or to explain what they meant by 'comply with therapy'. This contrasts with a qualitative study where the questions are open and the researcher can follow-up on leads given by the respondent and explore topics that were not anticipated. For example, Koo and colleagues found that focus group members who were carers were more likely to read both their own WMI and those of the people for whom they cared.⁶⁰ This had not been anticipated prior to the study.

In some studies, participants were selected who did not have the illness in question and/or were not taking a medicine that related to the written information being investigated. These studies do not offer the same insight into the outcomes of receiving medicines information as those that recruited patients who were actually taking the medicines studied; people may respond differently to real and hypothetical situations. This debate about 'hypothetical' studies, and the issue of **actual** versus **potential** patients as participants, also relates to the effectiveness strand of the review. It is highly relevant where information needs arise from the particular circumstances and experiences of an illness and its treatment. For example, in Grime and Pollock's study, many patients who had taken antidepressants for a few months had information needs in relation to stopping and continuing to take antidepressants.⁷² Uncertainties arose as a result of their experience of taking antidepressants which were not envisaged before they started to take them. These questions and concerns would not have been anticipated by someone who did not have depression or who had not taken antidepressants.

This is not to say that there is no place for hypothetical studies. They can, for example, make a contribution to the research base when the context particularly relates to receiving a newly prescribed medicine. Many people who are not at present categorised as 'patients' will have in the past been (or in the future be) prescribed medicines; the term 'patient' is not a static concept over time. The 'general public' routinely use medicines (bought OTC, as well as prescribed), so there is also a need to recruit them to such studies. However, researchers need carefully to consider and justify their selection of participants. This appeared not to be the case in many of the studies included in this review.

Although it is arguable that 'patients' cannot be considered distinct from the general public, in order to gain particular insight into WMI for patients on long-term therapy, people taking the relevant medicines have to be included.

Significance of the findings and their relation to the wider literature

Patient and professional perspectives of the value of written medicines information

The studies found that most patients read the leaflet which accompanied a prescribed medicine, at least on the first occasion that a medicine was used,^{57,60–63,65} and that professionals underestimated the level of patients' readership.⁶⁹ At a very practical level, patients reported finding information leaflets difficult to read and understand, for several reasons, including the language used and issues such as small print size. Many patients regarded the doctor as their most important source of information,^{50,118} although doubts were expressed about the feasibility of relying on doctors to answer queries about medicines outside of the consultation.^{51,118} Some patients mentioned that to ask directly for an information leaflet or to refer to this during medical consultations could be interpreted as challenging professional expertise and authority, signifying a lack of trust in their doctor.⁵⁰

The few studies which looked at the value that professionals place on the routine giving of WMI suggested that doctors do not often provide written information.⁶⁶ Professionals' acknowledgement of the positive functions of written information were often outweighed by concerns about the possible negative impact of written information on patients, in particular that it might discourage patients from taking a medicine.^{64,74} Doctors rarely encouraged patients to read patient information leaflets.^{55,64} Professional ambivalence towards patient information is also evident in the wider literature on patient information.^{119,120} For example, Bertholet and colleagues, in a survey of French rheumatologists, reported that less than one-third regularly advised patients to read the leaflet that came with their medicines.¹¹⁹

How much information should be included in a medicines leaflet?

A feature of several studies was many patients' desire for more rather than less information when given a choice.^{53,62,77} Some researchers, having found that some patients wanted detailed information, appeared to question their own

findings on this point and concluded that a concise leaflet might be valued more by the majority of patients than a longer detailed one.^{61,77} Similarly, those studies which included a professional perspective showed that doctors and pharmacists were concerned not to overload the patient with too much information. They regarded short and simple leaflets as more 'appropriate'.^{52,74} Outside the current review, in a study of nurses' roles in educating patients about medicines, Latter and colleagues found that nurses across several clinical areas in primary and secondary care considered that their patients did not want much information about medicines and that only a minority had unmet information needs.¹²¹ It appears that professionals might underestimate how much information patients may want, and also their ability to understand written information.^{52,69}

What information should be included in a medicine leaflet?

The role and value studies showed that patients wanted information on many aspects of their medicines and how to take them. When asked what information it was necessary to have, or what they would like to be included in leaflets, patients placed particular emphasis on the potentially adverse effects of a medicine.^{49,53,55–58,60,62,65,67,69–71,74–76} This was in spite of the fact that such information could cause anxiety.^{50,60,67,69,70} However, in a systematic review of research that investigated patient/professional communication, Cox and colleagues found that many patients were reluctant to question their doctor about medicines and particularly to ask about side-effects.¹²² This highlights the importance of patient access to good-quality written information as a back-up.

For their part, health professionals, in the small number of studies in the role and value strand in which they were involved, rated the importance of including information on side-effects much lower than patients.^{56,64,69} They favoured the partial and selective disclosure of side-effects in written information,⁵⁹ for example, it might be unsuitable to tell patients with a mental illness, or a terminal condition.⁶⁹ Similar results have been found in studies outside the current review in relation to spoken information.^{122,123}

This contrasts with the study of written information about chemotherapy, which found that patients particularly valued being given precise information about side-effects, how to decide if a side-effect was serious and details of

whom to contact if it seemed that it was. It is worth noting, unusually in the studies reviewed, that the chemotherapy leaflet for this study was developed in conjunction with patients who had cancer.⁶⁸ Overall, the research within and external to the role and value strand highlights the distance between patients and health professionals concerning the provision of WMI and the need to involve patients in the development of such materials.

Patients in several studies said that they wanted written information about medicines to be set in the context of their illness and to make reference to alternative treatment, including alternative medicines.^{71,74,75} Giving written information about the condition in addition to the medicine reassures patients that they have been prescribed the right medicine and enables them to understand the doctor's rationale for this choice.⁷⁴ In Cedraschi and colleagues' study, patients prescribed antidepressants to treat chronic pain had a leaflet which did not mention pain (not a licensed indication).⁷⁰ Some patients assumed the doctor thought they had a mental illness and that their pain was regarded as psychological rather than physical (even though their doctor told them otherwise). This illustrates how patients can be active interpreters rather than passive recipients of information.¹¹⁷ As a result of finding that patients wanted condition-based information, Nair and colleagues modified information sheets they had previously developed to include some information on the condition the medicine was to treat.⁷⁴

Incorporating patients' experiential knowledge in written information

Some focus group members in Raynor and colleagues' study mentioned how they had learned what worked and what did not work for them from their long experience of asthma and its treatment.⁷⁶ Their experiential knowledge was sometimes at odds with official information. Grime and Pollock also explored the issue of experience versus information.⁷² Their study showed that patient experiences of taking antidepressants did not relate to much of the content of an antidepressant leaflet. In turn, the leaflet did not reflect many of the issues and concerns about antidepressants that patients had experienced. Respondents valued hearing directly about other people's experiences of depression and its treatment.

Jazieh and Brown's study of information about chemotherapy was the only one in the review to use written information which incorporated

patients' experiential knowledge.⁶⁸ Two studies, not included in the current review because medicines were not their primary focus, shed further light on this topic. One was a focus group study where patients with breast cancer did not feel that the information conveyed their experience of receiving chemotherapy. This included incomplete information on side-effects rated as important by the patients, such as mouth ulcers, loss of taste and smell or stomach pains.¹²⁴ The other non-review paper demonstrated how useful patients found a patient guidebook on irritable bowel syndrome based on patients' experience of living with the condition.

Independence, accuracy and reliability of written information

Accurate and reliable information was valued by both professionals and patients but the poor quality of much of the available material was a cause for concern. Coulter and colleagues found inaccuracies and shortcomings in many of the leaflets studied.⁷¹ Buchbinder and colleagues' analysis of the content of documents for patients about medicines to treat arthritis showed that many had not been updated to incorporate new information.⁶⁶ External to the current review, a study by Ford and colleagues found that doctors considered much of the written information relevant to patient choice to be poor.¹²⁵ Herxheimer examined leaflets for NSAIDs written by pharmaceutical companies.⁷³ Apart from a lack of consistency across leaflets in what information was provided, he also found what he considered to be serious shortcomings in their content.

In two of the studies in the role and value strand,^{71,76} some patients queried the independence of leaflets in medicine packages written by pharmaceutical companies. Grime and Pollock raised a similar concern about an antidepressant leaflet written by a self-help organisation that received funding to produce it from a pharmaceutical company which manufactures antidepressants.⁷² Some patients perceived that leaflets produced by pharmaceutical companies were oriented primarily to satisfy legal and regulatory requirements with the aim of protecting the companies from medico-legal actions (although the manufacturers have to comply with detailed European regulations and receive approval for the leaflet from the MCA).⁷⁶ Despite such controls, NSAID package inserts in 1998–9, according to Herxheimer, did not reliably inform patients about the benefit and risk of NSAIDs. Even if patients' fears of the influence of commerce on the content of medicine leaflets are

without foundation, patients' trust in the information is potentially undermined by such perceptions of bias.

The use of written medicines information in decision-making

Patients used written information for a variety of purposes, including to help decide whether or not to take a medicine, to learn about and/or manage their illness and medicines, to check information from professionals, to prepare for consultations and to be able to explain to others the nature of their illness and its treatment.^{71,75} However, not all patients made use of written material on medicines and some left it up to their doctor to tell them as much or as little as it was judged necessary for them to know.^{50,60} They preferred a more traditional relationship with their doctor and perceived a tension and potential conflict between demonstrating confidence in professional expertise and authority and taking on the role of informed and active patient.

Similarly, the evidence suggests that patients adopt a range of positions in relation to shared decision-making. A previous systematic review of information provision to patients with cancer (and not specifically information about medicines) suggests that caution is needed before making general assumptions about which groups of patients would or would not like to receive information and take an active part in making decisions about treatment. That review found that patients with cancer at an early stage of the disease and those with advanced disease wanted more information than they had been given.¹²⁶

Patient preferences for involvement in treatment decisions and the role of written information in decision-making were not explored in depth in any of the studies in the role and value strand of the current review. However, a number of studies did give an indication of the range and diversity of patients' preferences for involvement.^{60,70,74-76} Some patients preferred no involvement. Others indicated that their information needs changed over time and depended on the nature and stage of the illness and factors such as whether they were the patient, parent or carer. These findings are echoed in the wider literature.^{120,126-129} The nature of patient preferences for information and shared decision-making is an important topic for future research.

One of the concerns raised by health professionals in the studies was that WMI might reduce compliance with treatment. This is relevant to

Donovan and Blake's argument⁶ that non-compliance can be viewed:

- positively, as a reasoned decision by a patient, or
- negatively, as deviance on the part of the patient.

Thus, written information might be seen as facilitating either reasoned decision-making or deviant non-compliance. The main use of WMI reported by professionals in the role and value studies was to educate patients in order to increase compliance rather than promoting patient choice. However, professionals' desire to educate patients about their medicines appeared inconsistent. Patients prescribed steroids in Raynor and colleagues' study⁷⁶ reported difficulty in obtaining spoken information from health professionals about the nature of their medicine (for example, whether it **was** a steroid), even if they asked directly. Similar findings were described in two studies outside the review, one of which involved patients prescribed steroids for asthma and the other patients with mental health problems prescribed antipsychotics.^{123,130}

Professional attitudes towards OTC and prescribed medicines appeared to be different. Written information was less likely to be read by patients for OTCs than for prescribed medicines.^{49,61,65} Indeed, some OTC products such as laxatives were not viewed by some patients as medicines at all,⁶¹ or as wholly benign,⁵¹ and these findings reflect those in the wider literature,^{131,132} together with concern that patients are not sufficiently well informed about risks of OTC medicines.¹³¹ Professional views about the desirability of educating patients about the use and possible risks associated with OTC medicines (information which patients themselves do not feel they need) are held in parallel with a widespread professional reluctance to provide patients with the information about prescribed medicines such as steroids or antipsychotics which they want to receive.

It was not clear in Raynor and colleagues' paper if patients wanted to find out whether or not their medicine was a steroid in order to decide whether or not to take it.⁷⁶ However, patients with asthma in a study external to the review had a similar experience to that reported by Raynor and colleagues' respondents in finding it difficult to obtain information about whether their prescribed medicine was a steroid.¹³⁰ The patients said that they would prefer not to take steroids but felt they

had no choice because of the severity of their asthma. Many had experienced severe side-effects which they had not been informed about in advance. Side-effects were also something patients felt they had to put up with in order to receive the benefit of the medicine. Findings from studies in the role and value strand which involved patients who had direct experience of the medicine and condition suggested that even if patients used written information to decide whether or not to take a medicine, it tended to be only one factor amongst several that patients evaluated.^{70,75} Professionals, in contrast, appeared to have a simpler view of patient decision-making where learning about the nature of a medicine or possible side-effects might, on that basis alone, lead to patients ceasing to take a medicine.^{64,74} The findings of the role and value strand of the review indicate that professional concerns about written information on side-effects leading to non-compliance are not well founded.

Some professionals were interested in providing written information to support patient choice or at least some involvement in treatment decisions.⁷³⁻⁷⁵ Herxheimer wanted written information on NSAIDs to be improved so that patients could personally assess if the drug was the right choice for them.⁷³ Some of the staff interviewed in a psychiatric hospital in Pollock and colleagues' study acknowledged that patients need good information to make informed choices, but again there was ambivalence and inconsistency.⁷⁵ However, the existence of good-quality written information is insufficient on its own to enable patients to make choices, if they are unable to access it. Health professionals have an important role in facilitating patient access to information and in encouraging its use. However, as mentioned earlier, not all professionals put this into practice. In one study, despite favourable opinions on written information, only one-fifth of staff said they would use the information with patients.⁵²

The roles of written information and spoken information

Two very different studies within the review, a controlled trial and a focus group study, gave insight into how lay people viewed written and oral information.^{57,76} Both showed that patients did not categorise information as spoken or written, but considered the **source** to be the most salient factor influencing their appraisal. Patients wanted to receive medicines information from their doctor rather than other sources. Patient information leaflets were not considered to be an

acceptable substitute for spoken information and discussion. This point was echoed by a number of other studies included in the review,^{50,60,70,75} and also the wider literature.¹³³ However, written information was felt to have a valuable role in increasing patients' understanding of their medicines, and reinforcing what the doctor had said. It could also be retained to be read at leisure and re-consulted if a need arose.^{60,63}

Within a wider ambivalence to WMI for patients, some professionals acknowledged the potential advantage that it could bring in saving time in the consultation.^{74,75} Other research has shown that patients are very conscious of time pressures in the consultation and that this inhibits their discussion of concerns, including treatment.¹³⁴ There are clear tensions between how patients and doctors see the role of written information in relation to spoken information.^{64,74}

On the issue of discrepancy between spoken and written information, Vander Stichele and colleagues found that only 2% of patients said they would follow instructions in a leaflet, rather than what they had been told by their doctor in the event of conflict between these different sources of information.⁶⁵ The older patients in Bandesha's study said that they would go back to the doctor to ask for reassurance and clarification.⁵⁵ These findings were the result of 'hypothetical' studies and may therefore reflect what people would do in theory rather than practice. Further research is needed into the ways in which disagreement between different sources of information impacts on patients and how they use their medicines.

Effectiveness of written medicines information

Overview of main findings

This strand of the review evaluated the effectiveness of written medicines information in terms of knowledge, attitudes and behaviour.

The effect of written medicines information on knowledge

The effect of providing written information about medicines did not increase participants' knowledge about medicines, in the majority of trials included in the review. This was based on synthesising 18 trials of varying quality and heterogeneous interventions, of which six statistically significant results favoured written information increasing knowledge.^{78,80,87,88,91,94} The evidence is therefore equivocal and at best

the WMI tested in these studies could be said to have a marginal positive effect. The effect may depend on a number of factors, such as the nature of the content, layout and delivery method of the leaflet. This is not to say that no WMI can improve knowledge, only that it was not shown to be improved by many of the interventions tested in the eligible studies. Overall, it is very disappointing that the eligible trials can tell us so little about the most basic function of WMI: to improve patients' knowledge of their medicines.

The only aspect of knowledge for which the identified trials could provide strong evidence was how best to express the likelihood of side-effects, with consistent evidence that the way in which risk descriptor information is portrayed, that is, numerically or textually, has important effects on knowledge about side-effects.¹⁰⁵⁻¹¹¹ Delivering risk information in a numerical rather than textual form was found to lead to a more accurate estimation of the probability and likelihood of a side-effect occurring and the risk to health of the side-effects. The findings do not support the use of textual descriptors alone, as this leads to an overestimation of the probability and likelihood of the risk of side-effects.^{105,108,109,111} All but one of these studies had participants who were potential rather than actual medicine takers.

The effect of written medicines information on attitudes

The evidence is uncertain as to whether written information can have an effect on treatment-related attitudes. There are two possible explanations. First, attitudes are difficult to quantify, and difficult to compare if not quantified.¹³⁵ Second, and perhaps more importantly, there was considerable heterogeneity in the facets of attitude measured and the outcome measures used.

The trials comparing a set of risk descriptors (very common, common, rare and so on)^{35,105-111} used consistent interventions and outcome measures. They found that participants reported having greater satisfaction with the information,^{105,108,109,111} and greater intention to comply with the medicine instructions, when they receive numerical risk information.^{105,108,109,111} When individuals received risk information as textual descriptors, they overestimated the perceived risk to health from a side-effect^{105,109,111} and judged the anticipated severity of the side-effect to be greater (than when given numerical information).^{105,108,109}

The effect of written medicines information on behaviour

Measurement of adherence to treatment instructions was the most common behavioural outcome (measured in four trials).^{34,78,84,85} There was some difference in findings between trials, but overall the results did not show that giving WMI would increase the medicine users' adherence to treatment instructions. Whether the lack of a positive effect on compliance (or indeed a negative effect) is disappointing depends on whether an informed decision not to take a medicine is seen as a desirable outcome. In the current climate of partnership in medicine taking (or concordance), where informed decisions not to take a medicine are accepted as the patient's right, then the use of adherence as a primary outcome measure in leaflet research needs to be re-considered.

Three trials measured the effect of written medicines information on patients' reports of side-effects.^{82,85,98} The hypothesis being tested was that the potential side-effects of medicines may be suggested to the individuals by the information they receive, that is, that they will think they have the side-effects (when they do not) as a result of reading such information.⁸⁵ Only one of the three trials found a statistically significant difference favouring an increase in side-effect reporting in those receiving the information.⁸⁵ The difference was small and the authors concluded that it was due to an increase in correct attribution of symptoms as side-effects. Hence there is no evidence that patients report more side-effects when given full information about possible side-effects.

Context and limitations of trials

Reporting of methods used in the trials was poor, as was reporting of whether or not the results were statistically significant. This suggests the need to be circumspect, as it is possible that the conduct of the methods used in some of these trials may have had limitations. Some of the issues relating to trial quality are those commonly reported in systematic reviews, whereas others are more specific to this review.

It was hoped to explore the role of theory as part of this study, but only a minority of papers cited any theory base and, in those that did, there was insufficient detail to allow development of this theme.

Methods

Many of the trials were conducted in ways that would not meet today's standards. Forty-three

trials described as using random allocation were included in our analysis, but only 28 reported how randomisation was undertaken. Two trials were considered to have conducted randomisation in a way that would not prevent bias,⁸⁶ and the remaining 26 did so adequately. It was possible to confirm whether concealment of allocation was conducted in nearly half of the trials. Where this was confirmed, concealment was judged to be adequate in only one trial.⁸⁷ Poor allocation of concealment in a trial is the factor most associated with bias, because it yields exaggerated treatment effects.¹³⁶ This suggests that the results of these trials in particular may be misleading, probably in the direction of exaggerating the effect of the intervention.

In studies of information provision (in general), it is difficult to blind the provider and impossible to blind the participant to the intervention he or she receives. Hence usually only the outcome assessor can be blinded. Twenty-three trials reported how blinding of the outcome assessor was conducted, and only 11 were judged to have done this adequately.^{34,78,80,81,84,86,89,90,93,99,103} This raises the concern that many of the trials were prone to detection bias, where it was possible that the outcome recorded by the assessor may have been influenced by knowledge of which intervention participants received.

Overall, only eight of the 43 trials reported how all aspects of the methods were carried out.^{34,84,86,90,93,103,105,110} Assessment of the quality of the trials was made on the basis of reporting in the published articles, and further information provided in reply to requests to the authors. It is possible that although trials have reported the methods poorly (e.g. due to constraints of publication space), the actual methods used may have been adequate.

The trials comparing risk descriptors which measured knowledge and attitude outcomes, predominantly by Berry and colleagues, offer a possible template for future research examining the effectiveness of written medicines information. These studies used standardised interventions and outcome measures across several trials of written medicines information.

Participants in trials of written medicines information

Several trials which met the inclusion criteria enrolled participants from the general public (and asked them to imagine a particular scenario), rather than people currently taking relevant

medicines. This mirrors the situation discussed in the role and value strand (see above), so the results of these 'hypothetical' studies needed to be interpreted in the light of the profile of the participants.

A further issue relating to recruitment to the trials is the age and level of education of the participants. Most medicines in the developed world are taken by older people, but they were not well represented in most of the trials, with some including predominately young and middle-aged people. The level of education, when reported, was skewed towards higher levels of education than in the general public as a whole. Some results may have been attributable more to the participants they enrolled than the interventions. For example, Strydom and Hall⁹³ found no significant difference in knowledge of the medicine between the groups in their trial of written medicines information plus spoken information versus spoken only. However, the participants in this trial were people with learning disabilities, and 40% in both arms of the trial had little or no reading ability.^{93,96} Neither set of findings can be generalised to the wider population.

Nature of interventions and the context of prevailing social trends and laws

Herbert and Bø argue that systematic reviews should explicitly assess the quality of interventions in trials.¹³⁷ This was done, looking (where available) at whether the interventions:

- provided information in the categories suggested by the EU guideline
- had used good practice in their language and layout
- were theory or evidence based.

It was evident that there was great heterogeneity between the components of the interventions. Some included information covering all five recommended EU information categories, but most did not. Twenty-eight papers provided a full or a partial copy of the information provided in the intervention. The trial we included by Van Haecht and colleagues was the only one to compare the effectiveness of a new and a traditionally designed information leaflet.⁹⁹ Evaluation of the influence of information design in WMI has not to date been a feature of research, but needs to be so in the future.

Second, there have been changes in the climate regarding the type and content of WMI expected

to be provided over time, which casts some doubt on the validity of comparing interventions. In particular, the EU⁸ and Australia¹³⁸ have legislated for specific information which should accompany all WMI. These laws came into effect in 1999 for the EU and nine of the 19 included trials conducted in the EU were published before then.^{34,78,79,85,87-89,99,103} No equivalent trials from Australia met the inclusion criteria. The relevance and transferability of the results of the studies conducted before the late 1990s in guiding current policy and practice are reduced because it is now largely accepted that people taking medicines should have access to all categories of information and, as a minimum, those designated by the five headings in EU patient information leaflets. Hence trials of effectiveness which evaluate interventions which do not include these five basic categories of information are largely redundant.

Outcomes in trials of written medicines information

None of the trials provided evidence of researchers deriving outcome measures through consultation with medicine users. Four trials measured adherence as an outcome, a measure which is more professional than patient centred. Adherence is also very difficult to measure and there is no gold standard. Those methods which are thought to be most reliable, namely blood levels and Medication Event Monitoring System (MEMS), are the most difficult to undertake, and difficult to use for patients on multiple therapy (MEMS was used by Peveler and colleagues⁸⁴ and by Vander Stichele and colleagues³⁴). Tablet count, a method less favoured currently, was used by Dodds⁷⁸ (with interview) and Vesco and colleagues⁸⁵ (alone).

The use of adherence as an outcome highlights the continuing contrast of perspectives of patients and health professionals, health system funding bodies, public health bodies and the pharmaceutical industry. It also underlines the importance of evaluating the significance of the findings about effectiveness from these different perspectives. The included trials highlight several other examples of outcome measures which may not be meaningful to medicine users, or relevant to understanding the effectiveness of written medicines information in actual use.

Length of follow-up

Length of follow-up in trials of medicines information giving is important. The reviewers did not set an inclusion criterion for this, although

this might be worthy of consideration in future reviews. However, it is unclear what length of follow-up would be adequate for determining the long-term effectiveness of WMI for a knowledge, attitude or behaviour outcome. It is probable that there may be different time spans relevant to the long-term development of the effectiveness of written medicines information for knowledge, attitudes and behaviour.

Length of follow-up was reported by the majority of trials (35). The mean follow-up period was 1 month, ranging from immediate (same day) to 111 days. It is likely that a change in outcome at the end of a same day trial may not be replicable to a longer period of time. The relevance of trial results from same day follow-up to people taking medicines over the long term may then be questionable.

Significance of the findings and relationship to the wider literature

This is the first systematic review of trials examining the effectiveness of WMI. Five previous reviews in this area were identified, but none could be described as systematic.^{21,22,26,32,33} The aims of the reviews differed. Morris and Halperin looked at the effects of information on 'knowledge and compliance'.²¹ Three reviews studied general issues surrounding WMI:

- Koo and colleagues examined factors influencing the use and impact of patient information leaflets.³²
- Buck covered written medicines information in general.³³
- Kenny and colleagues considered the usefulness and importance of information for medicines and conditions.²²

Arthur also examined the use of information in general, focusing on the context of chronic diseases and information available.²⁶

Hence four of the reviews did not share the same aims as the effectiveness strand of our review. However, in the fifth, Morris and Halperin examined, as here, the effect of information on knowledge and compliance (this was prior to the term adherence coming into use). They concluded that information alone will not aid compliance in long-term therapy.²¹

Haynes and colleagues conducted a systematic review of trials examining the effectiveness of different interventions (including information) in improving adherence to medicine instructions.

They found that the interventions were ineffective overall.² The finding of the present review that WMI on its own is unlikely to improve adherence to medicine instructions is in line with these previous findings.

Discussion of information design key informants review

As described in Chapter 1, it was expected that there might be a limited number of studies on WMI which would address both information design issues and meet the criteria for inclusion in this review. Bearing in mind the need for practical guidance to practitioners and policy makers, an additional strand was included in the review to compare the results of the medicines-focused systematic review with the well-established wider literature on information design that is relevant to all written information. As expected, very few studies included in the review addressed issues relating to the design of WMI.

Within the resources available, it was not possible to extend the review beyond the development of a framework, using this small sample of texts nominated by respected authorities. Inevitably, given the small field, there were some self-nominations.

The aim was to identify key principles which can be applied at a practical level for people involved in providing consumer medicines information. However, some of the texts recommended by the experts were written at a theoretical rather than applied level and could not be included. As can be seen from Chapter 3, some of those that were included were still not particularly focused on practice.

Information design is a complex discipline and any attempt to distil best practice poses major difficulties. A key tenet of the discipline is that information design is much more than just a set of rules about how, for example, to write and design a consumer leaflet.¹¹⁴ People with information design expertise should be involved before and during the process, and so should the end-user of the information. In particular, information design input when a problem is first identified might suggest that (for example) a consumer leaflet is not the appropriate solution. However, information design experts would still acknowledge the primacy of the eventual user in judging fitness for purpose of medicines information.

Some people who currently write information for medicine users (such as those in pharmaceutical industry regulatory or medicines information departments and health managers or health professionals) may not be the best people to write consumer health information:

- Do they know what information people actually want?
- Is their attitude to the information consistent with the end-user's?
- Do they know how to design and write effectively?

There is a strong argument for involving experts in information design. However, people without such expertise **do** find themselves involved in WMI. This may be as commissioners, writers, testers or providers of the information. Hence the need to give them some ground rules, based on the work of leaders in the field.

Many of the points coming out of the review could be regarded as common sense. However, experience shows that these points are often not applied in WMI. These include:

- Use short familiar words and short sentences.
- Use short headings which stand out.
- Use as large a type size as you can (within confines of the space available).
- Do not fill the page with text; leave plenty of white space.
- Use bullet points to organise lists (rather than continuous text).

Other points are less obvious, for example:

- Use a conversational tone of voice, addressing the reader as 'you'.
- Use the active voice ('Take this medicine ...' rather than 'This medicine is to be taken ...').
- Use non-justified text ('ragged right').
- Use bold lower-case text for emphasis (words in capitals or italics are hard to read).
- Pictures or graphics do not necessarily improve a document.

Since this review was undertaken, two pieces of governmental advice on the readability of written medicines have been published for consultation:

- US Food and Drugs Administration (FDA): Guidance on useful written consumer medication information (CMI)¹³⁹
- UK Medicines and Healthcare Products Regulatory Agency (MHRA): Always read the leaflet: getting the best information with every

medicine.¹⁴⁰ A guideline on the usability of the patient information leaflet for medicinal products.

The guidance in these publications is largely consistent with the findings of this review, and is likely to have originated from some of the same research and expert opinion.

When interpreting this evidence, it needs to be borne in mind that some of the recommendations from the different key texts will actually be based on the same original research. Most of the texts are a combination of wisdom and experience, and empirical evidence. A further issue is that a PIL is both **informational** and **instructional**. The texts examined made points which refer to one or the other and not always both.

It is also worth noting that much of the guidance gleaned from these texts is about layout and design, rather than content. It is clear from Hartley's work that the way in which a designer uses space on the page greatly affects ease of understanding and retrieving of information.¹¹⁶ Also, Schriver notes that the design of a document can influence a person's perception of it.¹¹⁵ Writers of WMI must remember this – easy to understand text is worthless if people cannot (or cannot be bothered) to find it.

It should be stressed that the guidance from this part of the review needs to be considered in context. Sless and Wiseman note that “no known principles of good writing or design, nor any readability scores or measures of reading age have been found which can predict how successfully a document will be used. Even if you are following an international standard of patient information which has been tested overseas, local consumers may have a different understanding of words and medicine use. That is why CMI [consumer medicines information leaflets] need to be tested”.¹¹⁴ Wright confirms that performance-based criteria are needed, and that approaches such as Readability Formulae take into account only a few features of the language used.²⁰ Leaflets with poor readability index almost certainly benefit from revision, but if the readability index is good, they may still contain ambiguities or misleading expressions. Also, Dickinson adds at the end of his 10 tips on writing medicines information: “Now ask the experts: patients”.¹¹²

Stakeholder workshops

The stakeholder workshops provided the mechanism for achieving the involvement of the

medicines user and relevant health professional in the review. In addition to addressing such factors as the stakeholders' right to know about research of relevance to their interests, and the likely benefits in terms of the research being more valued and trusted, the inputs had positive benefits on how the review was conducted and the ways in which the findings were interpreted.

The first workshop contributed to the early stages of the review by identifying examples of good and bad features of medicines information, in addition to a broad range of important factors concerning how, when and where such information should be made available. Several of the themes which arose concerned the context in which medicines information was given, for example, the information complementing the consultation with the prescriber. A common feature was the need for relevant and practical information that patients could use. It was clear throughout the workshop that medicine users valued the concept of WMI and viewed it as potentially empowering, allowing them to make informed choices in addition to giving them a sense of autonomy. However, there was a substantial gap between this conceptual value and the actual value of manufacturers' PILs.

The workshop outputs made the core team more conscious of the presentation, content and timing of written information in interpreting the results of both the effectiveness and the role and value strands. More importantly, they were better able to identify those areas that had been highlighted by stakeholders as being important, but which the review revealed to be under-researched. This was important in highlighting further research priorities from a more user-centred perspective.

The interaction within groups and during plenary sessions was not only rich in content but also involved all participants and appeared to provide sufficient opportunities to express their opinions. The activities were played out in a positive way, indicating that participants were relaxed and enjoyed the experience. Overall, these conclusions indicate that we achieved our workshop objectives of building a positive and trusting relationship between the stakeholder groups and the research team, and developing a shared understanding of what the review involved.

Formal and informal feedback after the second workshop showed that the workshop had provided an effective vehicle for identifying the views of key stakeholders about the review, its outcomes and related issues concerning written

medicines information. In general, stakeholders' expectations about research on medicines information were only partially fulfilled. Indeed, participants from all stakeholder groups expressed surprise and disappointment at the paucity of robust evidence of effectiveness of WMI. In addition, stakeholders provided many relevant and perceptive criticisms of the extant research, particularly with respect to the issues investigated. While the stakeholder input was used to good effect to help clarify many aspects of the review, there are two areas where this input was particularly influential.

Highlighting users' concerns

The workshops identified a set of issues that were often neglected by those conducting the research. In particular, the workshops identified the following factors:

- The importance of personalised and disease-specific medicines information.
- Perceived conflicts between the interests of patients and the pharmaceutical companies writing the leaflets.
- The need to address issues relevant to long-term medicines users such as side-effects that occur in the longer term and possible negative interactions with other medicines, given the increased likelihood that longer term users will be taking several other medicines.
- The timing of information delivery and the possibility that this will be available earlier during the consultation process.

Clarifying review findings

In the second workshop, participants provided interpretations of the findings that supplemented and in some cases challenged their interpretation. For example, workshop participants challenged:

- Whether compliance was a legitimate goal of written medicine information.
- Whether increased anxiety following the reading of possible side-effects is to be interpreted as inappropriate.

Synthesis of the three reviews and stakeholder input

This section brings together the four strands: the role and value review, the effectiveness review, the information design key informants review and the stakeholder workshops and identify, from the evidence of these sources, common themes and areas of disagreement.

Changes to the context in which medicines are prescribed and taken

Over the period covered by the studies included in this review (1972–2004), much changed in terms of the amount and content of written patient information routinely supplied about medicines, and also the research questions and methods used to investigate them. This poses significant challenges in considering the robustness of the evidence included in the review in relation to its transferability across time and context. The educated populations of the developed modern world can now access multi-media information about every topic. An effort of imagination is required to envisage the very different circumstances of the early 1970s, when patient information was first beginning to make an appearance on the research agenda. At that time, when the earliest studies in this review were being conducted, most patients receiving an NHS prescription for a medicine in Britain would have found it labelled 'The Tablets' or 'The Mixture'; the name of the medicine was not normally stated. It was only in 1980 that it became the norm for the actual name of the medicine to be included on the label.

The inclusion of a PIL in every pack of prescribed or OTC medicine is now taken for granted. By contrast, in 1987, just 32% of patients said they had been given information about side-effects and only 14% of patients reported receiving written information with their prescribed medicine.¹⁴¹ By the mid-1990s, the proportion of patients observed to receive spoken information about side-effects during consultations with their GP remained unchanged at about one-third.¹⁴² Within the EU, the inclusion of PILs with prescribed medicines did not become a statutory requirement until 1999. These standardised package inserts remain one of the most important, and probably often the sole, source of written information about medicines available to patients. However, widespread public access to such information on the Internet has developed literally within the last few years. The speed of change, and the rapidly shifting policy and clinical contexts in which written patient information has been developed and investigated, need to be taken into account when evaluating the earlier research included in this review.

The technology of information design has also changed markedly over the period when the reviewed studies were conducted. The review of information design showed a high level of expert consensus on the principles that should be used in

the production of WMI. However, most of the written information tested in the trials of effectiveness would not meet these criteria and only one of the RCTs reported any findings related to information design. This reflects the lack of input to research on medicines information from the information design domain across a large part of the 30-year span examined.

Until recently, the concept of 'effectiveness' of WMI has been an agenda driven by healthcare professionals almost entirely without patient involvement. Decisions about the nature and amount of information to be included in WMI were made solely by professionals in almost all of the reviewed studies in both the effectiveness and the role and value strands.

Expectations of research design have also changed. It is now accepted that in order to understand the results of an RCT, its design, conduct, analysis and interpretation must be transparently reported. However, these standards are very different from when many of the studies in the review were being conducted. It is only a decade since the publication of the first CONSORT statement.¹⁴³ Study design and methodology, and also formulation of topics, are products of their time and the research culture which frames the questions that can be asked.¹⁴⁴ By contemporary standards, many of the studies included in this review have methodological shortcomings, which limit the confidence that can be placed in the results relating to the effectiveness of medicines information. In addition, the focus on the patient perspective, the promotion of 'the expert patient' and the role and value of medicines information have arisen relatively recently: these research questions were just not pertinent to researchers of the early 1970s, often working within a narrow professional perspective and subscribing to the education model of patient information provision.

Outcomes from the use of written medicines information

The need for information

Acquisition of knowledge about the medicine at the start of treatment appears to be important to patients in developing their understanding about treatment, and in this respect early and sufficient (i.e. basic) knowledge might be considered a patient-centred outcome. Most patients said they read the medicines information leaflet the first time they were prescribed the medicine but not subsequently. It would be unreasonable to expect patients to read the same leaflet month after

month, and this finding highlights the question of how changes (for example in information about side-effects or interactions) can be effectively communicated to patients.

The basic function of any written information is to transfer knowledge and create understanding. Knowledge, measured as recall of information, was the most frequently measured outcome in the effectiveness studies. Overall, at best the evidence suggests a marginal positive effect of the WMI tested in these studies on knowledge, since the effect was statistically significant in only six of these 20 studies. However, it is important to recognise that the trials used recall of specified items of information to represent 'knowledge'. Although knowledge might be a relevant outcome, there are issues around both its meaning and operationalisation in the studies. The effectiveness studies tested participants' recall of information but none measured how this was processed into knowledge or how this was used. In assessing knowledge and how it is applied, it is also difficult to disentangle the confounding effects of prior experience of treatment with the same or similar medicines. In addition, there are many other confounding factors, including information from other sources such as the media and, most importantly, the experiences of others. As the information items to be recalled were selected by researchers, they may not have represented the information patients themselves might want to know. We would therefore question the transferability of the trial findings on 'knowledge' to the real-life situations in which patients use medicines.

Another important issue is that research in the wider field of health information has shown that the impact of written information depends on a number of factors not examined by the trials reviewed in the effectiveness review. The information design review identified these factors and how written information design should reflect them, such as impact of leaflet content and layout. The quality of the interventions tested in trials in the effectiveness strand in terms of content and layout was generally poor by today's standards and this would impact on their effectiveness. Overall, the evidence on effectiveness to date has not been able to address the question of whether WMI improves patients' knowledge in the context of their actual use of medicines.

In the role and value review, health professionals saw the primary purpose of written information as being to provide facts that would lead patients to

comply with treatment. Other research corroborates this finding.¹²⁰ This contrasts with the view of patients in the stakeholder workshops and the role and value review. They saw the use of WMI as being to help decision-making (a) at the outset, in terms of whether to take the medicine or not, and (b) on an ongoing basis, with decisions about managing the medicine, interpreting symptoms and side-effects and deciding whether medical advice was needed.

The medicine users in the stakeholder workshop did not talk explicitly about acquisition of knowledge as an important concern. However, users talked about the nature and understandability of the language used in WMI, which was often perceived to be inadequate, and this would impact on knowledge. The role and value review and the workshops found that patients prefer information that is individualised to their specific illness experience. However, none of the effectiveness studies investigated the use of WMI in a naturalistic way that reflected the ways in which patients might use the information according to their own needs, and none tested individualised information. This is an important gap, as the desire for information relevant to the individual medicine taker is clear from the role and value strand and the workshops.

A central point is the question of who defines patients' information needs. The findings of the information design strand pose the question of whether people who write consumer health information know what information people actually want. The role and value discussion strongly suggests the need for a two-pronged approach, with both professional and patient input. Furthermore, it is clear from the effectiveness strand that the studies were often designed without a clear view of how the information tested related to the information medicine takers actually want.

Amount of information to be included

A range of uses of, and needs for, information was found. The role and value review found that patients use medicines information for a number of key purposes, including learning how to manage their treatment and condition, helping to decide whether or not to take a medicine and explaining to others the nature of their illness and treatment. In order for WMI to fulfil these roles, patients wanted it to include information on a range of topics. However, not all patients wanted all this information all of the time. Indeed, in

some situations people want only brief information, depending on their need at the time. However, at various times, each category or type of information identified from the review was wanted by at least some people.

In the role and value strand, participants were asked in some studies for their views about preferred length of WMI. The findings showed that the quantity of information required is not constant and that both concise and longer leaflets were valued, depending on users' needs at different times. This is reflected in the workshop findings, where there was some desire expressed for brief and simple information. This emphasises the need for making available a range of different sources of information, or single sources from which the information required at a particular time can be easily identified and extracted.

Some of the variation in need can be attributed to the timing of information in relation to the course of the disease from diagnosis to long-term experience. The guidebook produced for Kennedy and colleagues' study on bowel disease was well received by both patients and professionals.¹⁴⁵ During the development of the guidebook, some of the patients in the study thought that it would be frightening for other patients to receive very much information when first diagnosed. On the other hand, most of the patients also said that they wished that the detailed information had been available to them at the time of their own diagnosis.¹⁴⁶ This suggests that patients would prefer to receive information even if some of it is unsettling and even worrying. Participants in the second stakeholder workshop were of the view that anxiety is an acceptable response to receiving information about illness and treatment and did not see it as a negative outcome.

Research outside of medicines information confirms the variability of patients' information needs and preferences.^{147,148} Further studies¹⁴⁹ suggest that patients want to have information that is relevant to their individual situation and needs, with implications for whether 'generic' written information could meet these needs. The research also confirms the gap between patients and health professionals in priorities for patient information, notably side-effects, a theme from the role and value and stakeholder workshop strands of the present review. It is one of patients' highest information priorities, but professionals have worries about its impact.

TABLE 20 Comparison of information patients want to receive: EU requirements, findings from stakeholder workshop and findings from role and value review

EU content categories	Stakeholder workshop	Role and value review
What is the medicine and what it is for	Purpose of the medicine in relation to your specific diagnosis, not all the conditions for which the medicine can be used	Purpose of the medicine
Before taking the medicine (contraindications; cautions; pregnancy)	Potential interactions	Contraindications
How to take the medicine	How to take the medicine effectively	How to take
Possible side-effects	Potential side-effects How common the side-effects are	Side-effects
How to store the medicine		
Further information (covers the medicine content and manufacturer's information)	How to reduce potential harm from medicines An estimate of how long before the medicine will have an effect To explain the reason for instructions (e.g. why the course has to be finished or why not to drink alcohol) How long to take the medicine Likelihood of treatment with the medicine being successful	Long-term effects and risks of damage Diagnosis and is this the right treatment for me? How the medicine works Information about the condition Alternative treatments Risks of not taking the medicine

Quality and information content of medicines information

Evidence from the role and value and workshop strands confirm that patients do not currently value the PILs supplied. This is because of deficiencies in content (e.g. complex language) and layout (e.g. small print size). The findings in relation to the amount of information included need to be considered in the current context in which health information is delivered. Giving consumers selective information or information which lacks detail is no longer acceptable, despite the evidence from the role and value strand that some professionals think that information should be brief and simple. The need to give comprehensive information is reflected in EU policy on PILs which requires that all the

information in the Summary of Product Characteristics (the SPC, prepared for the prescriber) is included in the patient leaflet, in a form that is comprehensible to the patient.

The findings of the review show that although some of the information that patients want to receive about medicines matches that which manufacturers are required to include in the PIL, there are also significant areas that are not covered (*Table 20*). In particular, the role and value review and the stakeholder workshops showed that patients want information that relates to their own condition, to have information about that condition and to know about other treatment options. Participants in the stakeholder workshop in the review also identified the likelihood of

success of the treatment as information they would like to receive and this was mirrored in a study outside of the review.

The findings suggest that the paper-based PIL could be further improved. Kenny and colleagues, in their review of PILs, note that “one of the main problems with the prescription information leaflets included in drug packs is that they are rarely condition- specific”.²² It may be unrealistic to expect that all of the aspects identified in the present review could be covered. However, the findings in relation to content could be used to guide the producers of other sources of written medicines information, notably that which is web-based.

Side-effect specific issues

The role and value strand and the stakeholder workshops confirmed that information on side-effects is paramount for people taking medicines. Health professionals worry about the possible negative impact of side-effect information on patients, but the findings of the role and value strand suggest that some patients prefer to be ‘worried and aware’ rather than the reverse. Overall, the evidence from the trials reviewed showed that providing information about side-effects does not increase the side-effects experienced or reported, but does mean that they are more likely to be attributed to the medicine. The role of medicines information in enabling patients to recognise side-effects is potentially important in improving safety by enabling patients to alert a health professional to the side-effect, or reporting it directly to the MHRA.¹⁴⁰ No evidence was found to confirm professional concern that providing information on side-effects will lead to patients erroneously reporting side-effects.

The only aspect of side-effects information in PILs for which robust evidence was available covered how the likelihood of side-effects occurring should be described. These trials showed clearly that numerical descriptors were superior to text descriptors alone in all of the outcomes measured, and these findings were also endorsed by participants in our second stakeholder workshop.

Patient-centred outcomes

The analysis illustrated the extent to which the effectiveness trials addressed areas of importance to patients. The outcome measures used in the effectiveness trials were defined by professionals and generally were not patient centred. Therefore,

it is perhaps unsurprising that issues of potential importance to patients featured in only 20% of the 43 effectiveness studies. Future trials of WMI will need to take into account patients’ views if they are to be meaningful. The findings of the role and value strand suggest some areas for development of research questions and future outcome measures that would better reflect the ways in which patients use information to support decisions and actions.

Following on from the 10 patient-centred processes that were identified from the role and value strand (see row headings in Appendix 7), patient-centred outcomes from WMI that could be tested in future research are:

- Enhanced patients’ self-management of their treatment.
- Supported patients’ decision whether or not to take the medicine.
- Patients’ understanding of the rationale for the prescriber’s choice of medicine.
- Patients able to check if the appropriate/right medicine was prescribed.
- Increased knowledge and understanding of side-effects.

Professionals, provision of information and patient–professional interaction

The effectiveness studies shed little light on the impact of WMI on the relationship between patient and professional. Although there were some attempts to compare written and oral information, limitations in the study designs meant that no conclusions could be drawn. The role and value studies found that patients saw discussion with their doctor about the medicine as their primary source of information about that medicine. This was mirrored in the workshop discussions. However, other research has consistently shown that patients report that they receive too little information and feel unable to raise questions and concerns during consultations with the doctor. Patients in the role and value studies would have liked more time to discuss medicines with their doctor. Other research shows that written information was seen as an adjunct to the oral information received and could be used as a source of reference if needed. Kenny and colleagues suggest that, “ideally, the written leaflet ... should have reflected what has been discussed in a consultation”.²² The workshops suggested that timing of delivery of the information was important and that some wanted it earlier in the process, that is, during or before the consultation.

Few studies in the role and value strand addressed professional perspectives on WMI. However, research from the wider health information field has elucidated professionals' attitudes and behaviour in relation to information provision for patients. That research showed that some doctors identified certain groups of patients who should not receive detailed information, including those who were poorly educated, 'obsessional' patients, older people and 'highly anxious' patients.¹²⁰ The role and value strand confirmed this professional ambivalence and showed that it existed among both pharmacists and doctors.

The evidence from the role and value review indicates that most professionals have not routinely encouraged patients to read medicines information leaflets and this confirms findings from other health information studies. This is significant, as the effectiveness studies mostly used interventions which were handed personally to the patient by a health professional, rather than adopting the current practice of providing the information as package inserts. This raises questions about transferability of findings to inserts.

Methodological aspects

Few firm recommendations can be made from the effectiveness strand and a large proportion of these recommendations relate to further research priorities. Why is this? The possible reasons include:

- There were few experienced research groups with a strong research focus on a theme of medicines information for patients.
- Many of the trials were undertaken by motivated health professionals (acting in isolation) without access to experienced researchers. This may have contributed to the lack of evidence-based, theory-driven research. Those papers that did make reference to theory generally cited insufficient detail for any conclusions to be derived.

A further issue limiting the findings is that for even those trials from which we **have** been able to make recommendations, for some the actual intervention was not available for us to examine.

The age of people in the trials and the fact that most were educated to secondary school level, with little evidence that they reflected a mix of ethnic backgrounds, limit the generalisability of the research. However, some studies did not report these data and this reflects a wider

level of incomplete reporting of methods of the trials.

A key finding from the second stakeholder workshop was dismay at the relatively small number of trials conducted and the small number whose quality meant the findings were robust. One reason for this relative lack of research may be the different domains across which consumer medicines information overlaps: information design, public health, pharmacy, medicine, psychology, sociology and the drug industry. Much of the research took place at a time when inter-professional and inter-disciplinary research was not the norm. This lack of research is in contrast to the large number of clinical trials undertaken on the medicines themselves.

The use of 'knowledge' as an outcome measure in the effectiveness trials has already been discussed. There are also methodological issues in respect of the other outcome measures used. One or more attitudinal measure was included in 19 of the effectiveness trials. It was noteworthy that the effects of information provision on satisfaction received little attention in the reviewed studies. Only one trial measured general satisfaction with information received among patients receiving WMI and the findings showed it to be significantly higher than in patients who received no information. Only one trial⁸⁸ measured participants' worry about taking the medicine and how it was affected by being provided with a medicines leaflet. It could be argued, on the basis of the role and value studies, that this may not be a suitable outcome measure, as anxiety may be an appropriate response to receiving information about taking medicine. However, if the level of anxiety is to be measured, a validated scale should be used. In a large RCT on health information prior to the development of a patient guidebook on inflammatory bowel disease, some gastroenterologists suggested that information provision might make patients unduly anxious.¹⁵⁰ It was for this reason that the outcome measures in the study included anxiety, which was found to be unaffected.

Few of the effectiveness studies attempted to measure behavioural outcomes. Compliance was included as an outcome measure in a small number of studies, that is, they measured the extent to which patients took the medicine in accordance with the prescriber's instructions, or whether patients continued or stopped treatment. Compliance with therapy was seen as one of the purposes of the information by professionals, as

found in the role and value strand. However, the question of the relevance of compliance as an outcome measure is addressed by findings from the stakeholder workshop and from the role and value review. The possible role of WMI in relation to compliance was not raised by the participants at the stakeholder workshop, the inference being that it was not viewed as an appropriate measure. However, the role and value review showed that compliance was an outcome desired by some health professionals. In discussion of the findings of the effectiveness strand at the second workshop, participants queried whether compliance was a patient-centred outcome. That those studies using compliance as a measure found a lack of effect is not surprising, as the research findings from the role and value strand confirm that medicine taking is a complex behaviour and that WMI is only one of many factors influencing this.

Limited involvement of medicine users

A finding common to the studies included in both the effectiveness and the role and value reviews was the lack of patient and service user involvement. There were two reasons why this limited the potential usefulness of the studies. First, in the effectiveness studies there was no evidence that medicine users were asked to take part in decisions about the selection of outcome measures. The measures selected were therefore

likely to reflect largely professionals' rather than patients' concerns, whereas both need to be equally considered. Findings from the stakeholder workshop show that some of the most commonly measured outcomes – compliance and recall of information – did not feature in the issues that patients themselves raised. Second, researchers appeared to have predefined the response categories in most of the quantitative survey-type role and value studies without any reference to medicine users. Effectively this restricted the possible answers of the study participants to those that the researchers had previously identified.

The role and value review found that patients would like WMI to include the views and experiences of medicines users. This was also reflected in the stakeholder workshop. Since the review started, regulations have been put in place across the EU whereby companies have to 'consult with target patient groups' about their PILs before a medicine can be granted a licence.¹⁵¹ However, this is limited to patient testing of information predefined by others, rather than patients being involved in defining the scope of the information. Other research supports the finding that patients value the inclusion of experiences of other patients and want more of this type of information.¹²⁰

Chapter 5

Conclusions, implications and recommendations

Enabling people to become more involved in their healthcare is a high priority in UK health policy. During the undertaking of this review in 2005, further Government documents have emphasised this trend:

“The aim of this Government is to have a patient-led NHS empowering them with the information that allows participation and decisions about their healthcare”.¹⁵²

This follows from the strategy document published early that year:

“Better information, better choices, better health: putting information at the centre of health”.¹⁵³

There is also clear evidence that the EC values consumer medicines information,¹⁵⁴ meaning that this systematic review covers an important priority in healthcare systems across Europe. It affects every person who takes a medicine (the great majority of the population) and nearly all people who come into contact with the NHS.

The combination of a quantitative and qualitative review, an exploration of best practice in information design, plus the input from stakeholder workshops allowed this review to look at all perspectives and explore issues not anticipated in advance. Few well-designed RCTs were found that answered questions relevant to current policy and practice in WMI. This is partly a result of the changing landscape in healthcare provision. For example, the role of information in supporting shared decision-making was not a perspective addressed by much of the research undertaken in the past. It was found that most people read WMI when first supplied, but people do not value package insert leaflets, with their format and content presenting problems. The leaflets do not meet people’s information needs, including the need for information before prescribing or purchase, in order to decide if it is the right medicine for them. The current imbalance in leaflets in favour of harm information does not support this decision-making.

Once the decision has been made to take the medicine, then the information is used to manage the use of the medicine, that is, how and when to take, interpreting symptoms or side-effects and

knowing when to ask for further advice. Full information about side-effects remains the priority for many patients. People would like information which is tailored to their needs, notably to their illness (rather than covering all the illnesses for which a medicine may be used). They would also like information about other treatment options. There is some evidence that OTC medicines (which do not need a prescription) are perceived as safer and that people are less likely to give priority to reading information about these medicines.

Spoken information from the prescriber remains the most important priority for most patients. The level of detail required varies between individuals, but also varies for individual people at different times. Some health professionals feel that people should be given information that is brief and simple rather than extensive, and there is some evidence that they are reluctant to supply such written information or recommend it to patients. Some health professionals feel that increased compliance with medicine taking is the main goal of information provision, but this is not reflected in the views of the patients. Deciding not to take a medicine after being given the relevant information should be considered a satisfactory outcome in most cases.

The drive towards more effective written patient information is the result of a range of different motives and agendas, reflecting the diverse and sometimes diverging interests of patients, professionals, government and the pharmaceutical industry. Many questions remain unanswered and we have identified implications for these key stakeholders, set out below, beginning with general points for all producers of medicines information for patients followed by specific implications for different stakeholders. We then go on to identify gaps in research and make recommendations for future research.

Implications

Producers of written medicines information

Patients varied in how much written information they wanted. Some said they were put off reading

a leaflet that was too long, whereas others wanted such detailed information. The review has shown that information needs vary widely between people, but also for individuals at different times, according to the nature and severity of illness and the patient's current understanding. However, it is unlikely that a stand-alone medicines leaflet could be devised that would be suitable for all patients, on all occasions, no matter what the medical condition or stage of illness.

The review confirmed that patients wanted written information about medicines to be set in the context of their particular illness. To meet this need, it has been suggested that doctors and pharmacists could generate tailored leaflets electronically at the point where a medicine is prescribed or dispensed. Such computer-generated information would allow the desired individualisation of written medicines' information. Web-based information clearly offers promise in tailoring information but there were no published studies of Internet-based medicines information which met the review criteria.

Some patients thought that their experiential knowledge should be used when medicine leaflets are developed. This would necessitate professionals recognising and valuing lay expertise, and information producers involving patients throughout the process of developing written information, including decisions over what information the leaflet should contain. Some professionals expressed concerns about whether written information is kept up to date. When leaflets inserted in the medicines package are updated there is also a question of how to alert patients to the fact that the information has changed, since usually patients only read the leaflet when using a medicine for the first time.

The research evidence for the effects of provision of WMI is not consistent, in terms of its effects on changing knowledge about medicines, attitudes towards medicines or medicine-taking behaviours in general. Presentation of the risk of a side-effect numerically is consistently associated with a more accurate assessment of the risk and a more positive attitude towards taking the medicine. Revision of the EU Guideline on the readability of patient information leaflets is expected in 2006, and we hope that the evidence that we have reviewed on risk communication will be reflected in the new document, in addition to the expert information design principles.

Most people like to receive WMI, but do not feel that what is currently provided meets their needs.

Producers of WMI should carefully consider the potential impact of medicine information on the knowledge, attitudes and behaviour of medicine users. This may be heavily dependent upon the wording of the information, the design of the document and the way it is delivered. Taking account of the information design principles mentioned above would be one way of taking this forward.

Not all patients want to be involved in decision-making about treatment and their desire to do so varies between patients and in the same patient over time. Written information which spells out the detailed risks and benefits of taking a medicine is likely to be helpful to a patient who is trying to decide whether or not to take it. The impact of the same information on a patient who wishes to devolve decision-making to the doctor could be negative and increase uncertainty and worry. However, overall the findings indicate that patients would prefer the information to be available to them even if it sometimes increases anxiety. Progress in the delivery of tailored information would help to meet the needs of various patient perspectives.

Patients

The results of the 2005 national NHS patient survey provide contextual data on the extent to which available medicines information meets patients' needs. The survey found that 18% of people who had been prescribed a new medicine said they received no information about side-effects and a further 21% said they had received some information but had wanted more.¹⁵⁵ The findings of the present review emphasise the importance that patients place on receiving sufficient information about side-effects. Most patients in the national survey (80%) said they had received sufficient information about the medicine, and 11% said they would have liked more information. These results suggest that at the time a new medicine is first prescribed most patients think they have received sufficient information. The review confirmed that information needs change over time and according to individual circumstances.

Healthcare professionals

The role and value review and consumer workshops showed that patients view WMI as supporting and supplementing the information provided by health professionals during consultations. Patients were clear that not only did they not want written information to replace spoken information from their doctor, but that

written information often needed subsequent explanation and clarification from a health professional. The review found that patients already think they have too little time to discuss medicines with the prescriber and it appeared that patients often did not get spoken explanations in support of written information.

Healthcare professionals and those involved in their training can use the findings of the review in two ways:

- **Prior to consultations with patients**, healthcare professionals can establish personal or practice 'trusted' sources of written information which can be provided or recommended to patients. They should use the findings of this review in relation to information that patients find useful, and on principles of effective design. They should seek out materials that cover both conditions and treatments. In addition, they should, if considering producing written information, involve patients and medicine users and use the principles of effective design included in this review.
- **During consultations with patients**, healthcare professionals can encourage patients to read further information about both condition and treatment with an invitation that 'authorises' further discussion where queries and concerns arise. They should recognise that information about side-effects is of key importance to patients, and should routinely include this in the discussion. At the next consultation, they should ask if the patient has any queries or concerns about what they have read.

NHS policy makers

The findings on the role and value of WMI are highly relevant to the implementation of current policy on 'Information Prescriptions' and the NHS Patient Information Bank.¹⁵³ Childs points out the different implications if health professionals are to be expected to provide a 'prescription' which is a list of sources of information or are being expected to provide the information itself.¹⁵⁶ The findings could be used to design a framework against which to develop information on treatment that could be held in and accessed from the NHS Patient Information Bank, and also inform the development of medicines content for NHS Direct Online and NHS Direct Interactive.

Regulatory authorities

During 2005, some progress was made from the regulatory perspective, including the publication by the MHRA of a guideline on User Testing of

leaflets together with guidance on usability of PILs.¹⁴⁰ The report in which these documents appeared also made a series of recommendations, although it is not clear who is expected to take action. One key recommendation is that "The views of patients should be taken into account at all stages in the development of patient information leaflets". Although it is unclear how this is to be implemented, our review has confirmed its necessity. User testing is an important change which will directly involve consumers in assessing the understandability and clarity of leaflets. However, without consumer involvement in content setting and development, testing a predesigned leaflet will, although useful, be of limited impact. Regulators therefore need to ensure that the recommendation for greater patient involvement is fully implemented.

The appropriateness of applying the same rules about information provision to OTC medicines as to prescription medicines may need reconsidering. Information about OTC medicines may need more prominence because of the perception of their being safe and consequently the information being less important.

In the light of the evidence showing reluctance by some health professionals to inform patients about potential adverse effects of a medicine and the disinclination of patients to ask, patients should be able to access full information on side-effects in written medicines information. We found that patients valued written information that enabled and 'authorised' them to seek help by providing them with contact details for relevant services should serious side-effects be experienced. PILs in the UK could adopt this approach by providing information about routes for patient reporting of suspected side-effects.

Pharmaceutical industry

Most patients do not value the current package insert PILs. Manufacturers should take full advantage of the new requirement to test such leaflets with target patient groups, to meet patients' needs better. They should also take account of the information design principles described in Chapter 3. Some patients do not consider information written by medicine manufacturers to be sufficiently independent and therefore question its credibility and reliability. This suggests that the leaflets inserted in the medicine's package may not be seen as trustworthy by patients when they are written by the pharmaceutical industry. This view was shared by the patients in the stakeholder workshops.

Pharmaceutical companies have a statutory responsibility to produce PILs in their current format and increased patient involvement in the development of leaflets would be one way in which the process could be made more transparent.

Medicine Guides (<http://medguides.medicines.org.uk/>) are a new form of electronic information on medicines funded by the pharmaceutical industry and developed by the Medicines Information Project. In a pilot phase, guides for three treatment areas, epilepsy, influenza and cholesterol, were available with a separate electronic leaflet for each individual medicine with hyperlinks to information about the condition which is located within NHS Direct Online. A revised format has now been developed and is available for medicines for asthma. The findings of this review could be used to assess and develop further the existing format and content of Medicine Guides. Studies of the levels of usage, role and value of this new source of patient information will be important while the programme is being extended to other treatment areas. The previously mentioned importance of the input of patients at all stages of the information development process applies equally to web-based information such as Medicine Guides.

Patient organisations

As producers of WMI, patient organisations can use the findings of the review relating to content and design to consider and further improve existing materials and inform the development of new materials. Patient organisations will continue to be an important source to identify patients to participate in the development of information materials by pharmaceutical companies and other providers.

Implications for stakeholder involvement in research

Stakeholder workshops were an important component of the review. The research team's participation in the workshops ensured direct exposure to stakeholder perspectives from a very early stage in the review. Informal feedback from the attendees indicated that the workshops were successful in producing a sense of involvement in the review and in making them feel that they were valued as active participants in the design and interpretation of the findings. Incorporation of the patient perspective in particular was key to the review and was sustained beyond the workshops through patient membership of the core research team. Other researchers will be able to make use

of the methods from the stakeholder workshops in future reviews and other research.

Gaps in the evidence base

The review identified several gaps in the published literature:

- The increasing availability of medicines information through the Internet is not yet reflected in published research. This will partly reflect the inevitable time lag between a development, recognition for the need for research, undertaking the research and then publication. The stakeholder workshops did not give a high profile to Internet-based information. However, the role and value review notes the need for further investigation on how information can be made available in a timely fashion to meet the various needs of people taking medicines.
- The application of principles of good practice in information design to WMI is notable by its absence from published RCTs.
- The review found that patients want WMI to be individualised to their situation but no published studies have assessed the impact of such provision on patients' use of, and satisfaction with, the information.
- No studies were found that considered or attempted to meet the needs of particular groups, for example people with sight loss, low health literacy or who do not read English.
- Little is known about the effects of information provision at different times in relation to when the medicine is prescribed, particularly about when information is provided before the decision, and when people have been taking a medicine long-term.
- The populations studied need to include appropriate numbers of older people (who take most medicines) and people of all levels of education and ethnic groups
- Very few studies to date have considered health professionals' perspectives in WMI provision. This is important, considering their role in information supply and in providing guidance on where to find information. We also found no studies of carers' perspectives on WMI.

Recommendations for future research

Recommendations are made below in two main categories – general principles and specific areas that have been under-researched.

General principles for future research

The review has identified a number of areas where future research could be improved in terms of the robustness of its design and conduct, and the potential relevance and application of its findings:

- Greater user involvement, including patient input to framing outcome measures.
- Consistent and validated outcome measures to allow comparison between studies.
- Studies where patients use information in naturalistic rather than laboratory or other artificial settings.
- Building in a qualitative component in future trials.
- Applying recognised standards to design, conduct and reporting of trials.
- Defining and applying an optimal length of follow-up for evaluating the effectiveness of WMI.
- Acknowledging the current social and policy context in considering the design and delivery of the intervention; for example, excluding certain content items is no longer acceptable, nor is deciding when information is accessible.
- WMI overlaps with spoken information from the prescriber, general knowledge or information about the illness or other treatment options. Further research would benefit from taking this into account rather than considering the written information in isolation.

Future research

There is scope for research from the micro-setting (patient need for and uses of medicines information) to the macro-setting (policy issues relating to the mutual responsibilities of patients, professionals and state).

1. Package insert leaflets

In the short to medium term, hard-copy manufacturers' PILs will continue to be the only source of WMI that all patients will receive. Further studies are needed on how they can best meet patients' needs:

- (a) determining the best content, layout and delivery methods
- (b) including more benefit information.

2. Internet-based information

In an increasingly free and unregulated market of information exchange, how will responsibility for accessing and providing medicines information change. What are the implications for traditional routes of information provision to patients (professionally dominated)?

- (a) Evaluate the effectiveness, role and value of medicines information provided on the Internet.

3. Qualitative research

More qualitative research; it is surprising that we still know so little about patient preferences and uses of medicines information. More research is needed to explore:

- (a) how different types (e.g. age, education, illness types and severity) of patients and carers (very neglected so far) search for and use medicines information in different settings, and extending over time, as an iterative and reflexive process
- (b) the timing and impact of the type and amount of written medicines information during the course of a chronic illness, including information promoting patient choice
- (c) level of desire among patients for information, exploration of the tensions between patient preferences and policy directives
- (d) differences between short- and long-term information needs, including considering the information needs of those prescribed multiple medicines (polypharmacy)
- (e) studies of how patients experience and respond to written and spoken information from different sources and where the messages may be divergent or contradictory.

4. Tailored information

Further research is needed to explore innovative ways in which written medicines information can be tailored more sensitively to individual patients' needs, including studies of:

- (a) how best to meet the requirements of patients with special needs
- (b) effects of introducing lay experiential knowledge into WMI; how to collect and decide on what experiences to include.

5. Professional perspectives

These include:

- (a) professional attitudes towards the use and usefulness of WMI, including both medical and non-medical prescribers
- (b) professional attitudes to the concept of the 'expert patient'
- (c) investigation of the uses and relevance of 'information prescriptions'.

6. Incorporating written medicines information into consultations

This should include:

- (a) the feasibility of using tailored WMI in the consultation without impinging on the opportunity for spoken exchange between doctor and patient
- (a) patients' experiences and views of being encouraged to read more about their medicines by their prescriber.



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Contribution of authors

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Additional individual responsibilities were as follows: DK 'Theo' Raynor (Professor of Pharmacy Practice) had overall responsibility for the

direction and management of the project and took part in analysis and interpretation of the data. He undertook the information design strand of the review, co-led the writing of the report and was the report's editor. Alison Blenkinsopp (Professor of Practice of Pharmacy) worked with Theo Raynor in leading the project (in particular the qualitative strand) and led the conception of the method of synthesis of findings from the various strands. She was a primary reviewer for the qualitative strand, and co-led with Theo Raynor the writing of the report. Peter Knapp (Senior Lecturer) was the project coordinator, led the quantitative strand of the systematic review, was a primary reviewer and undertook data extraction and analysis. Janet Grime (Research Fellow) led the qualitative strand of the systematic review, was a primary reviewer, undertook data extraction and interpretation and wrote the qualitative results and discussion. Donald Nicolson (Research Assistant) led the search and retrieval aspects of the review, was a primary reviewer, led data extraction for the RCT studies and wrote the quantitative results and discussion. Kristian Pollock (Senior Research Fellow) provided expert input into the report drafts, particularly the qualitative aspects. Gill Dorer (Patient Consultant) provided invaluable consumer input into the review, with key input into the conduct of the stakeholder workshops. Simon Gilbody (Senior Lecturer) provided particular expertise in support of the systematic review process, along with general insights into research processes. David Dickinson (Patient Information Consultant) provided invaluable information design input, along with a consumer perspective. His writing skills added value to the final report. John Maule (Professor of Management Decision Making) conceived, designed and led the reporting of the stakeholder workshops, a cornerstone of the project. Pat Spoor (Library Faculty Team Leader) worked with Donald Nicolson and Peter Knapp to devise and undertake the search, alongside the provision of general advice on the systematic review process.



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Appendix I

Workshop programmes

Consultation Workshop

Friday 1 October 2004, Leeds

Programme

- 11.00 Registration and coffee**
- 11.30 Introduction and welcome**
Theo Raynor
- 11.40 Table Discussion 1: Good and bad examples**
- Discuss a previous personal (or friend/family) example of written medicines information.
 - Was the information useful?
- 12.05 Report back to whole group**
Alison Blenkinsopp
- 12.20 Why is medicines information important?**
David Dickinson
- 12.35 What kinds of research have been done?**
Alison Blenkinsopp
- 12.45 How are we going to do this systematic review?**
Peter Knapp
- What is a systematic review?
 - What is your input as a consumer?
- 13.00 Lunch**
- 13.45 Table Discussion 2: Introduction**
Gill Dorer
- What we'd like you to do
- 13.55 Table Discussions**
- What are the important things for patients?
- 14.50 Coffee break**
- 15.05 Feedback and summing up**
Theo Raynor
- 15.30 Close**

Consultation Workshop

Monday 12 September 2005, Leeds

Programme

- 11.00 Registration and coffee**
- 11.31 Introduction and welcome**
Theo Raynor
- 11.41 What you hope will come out of the review**
John Maule introduction, then individual group discussions
- 12.00 Role and value review: Summary of main findings**
Janet Grime
- 12.15 Table discussions of role and value review findings**
- 12.45 Lunch**
- 13.15 Effectiveness review: Summary of main findings**
Donald Nicolson
- 13.30 Table discussions of effectiveness findings**
- 14.00 Feedback on information design**
- 14.10 General feedback of overall findings**
Chaired by Peter Knapp
- 14.50 Coffee break**
- 14.35 Recommendations**
■ For priorities for future research
■ Other general recommendations
Alison Blenkinsopp
- 15.10 Feedback on usefulness of stakeholder workshops**
John Maule
- 15.15 Summing up and what's next**
Theo Raynor

Appendix 2

Search strategies

CINAHL 1982–2004, OVID, searched October 2004

1. exp Drug Therapy/
2. exp Medication Compliance/
3. exp Pharmacy Services/
4. exp Medication Systems/
5. exp Pharmacists/
6. exp Prescriptions, Drug/
7. exp Drugs/
8. exp Drug Utilization/
9. exp Self medication/
10. Patient Compliance/
11. Treatment Refusal/
12. prescrib\$.ti,ab.
13. prescription\$1.ti,ab.
14. nonprescription\$1.ti,ab.
15. over the counter.ti,ab.
16. ((OTC or otc) not (organotin or ornithine or oxytetracycline)).mp.
17. dispens\$.mp.
18. pharmaceutical\$1.ti,ab.
19. drug\$1.ti,ab.
20. medication\$1.mp.
21. complian\$.mp.
22. (noncomplian\$ or non-complian\$ or non complian\$).mp.
23. comply\$.mp.
24. (concordance not twin\$).mp.
25. (adher\$ not leukocyt\$).mp.
26. treatment refusal.mp.
27. self-administ\$.mp.
28. or/1-27
29. Drug Labeling/
30. exp Drug Packaging/
31. Pamphlets/
32. Product Labeling/
33. (drug\$1 adj2 label?ing).mp.
34. pamphlet\$1.ti,ab.
35. (medicines adj2 information).ti,ab.
36. leaflet\$1.ti,ab.
37. Print Materials/
38. (medicines adj2 education).ti,ab.
39. (patient\$1 adj2 information).ti,ab.
40. (consumer\$1 adj2 information).ti,ab.
41. (written adj2 information).mp.
42. (print\$ adj2 information).ti,ab.
43. booklet\$1.ti,ab.
44. brochure\$1.ab,ti.
45. Readability/

46. exp Documentation/
47. Information Resources/
48. Teaching Materials/
49. Health Knowledge/ev
50. exp Drug Information/
51. exp Information Needs/
52. Consumer Health Information/
53. Internet/ut
54. or/29-53
55. exp Patient education/
56. 28 or 54
57. 55 and 56
58. 28 and 54
59. 57 or 58
60. (package\$1 adj2 insert\$1).mp.
61. (prescri\$ adj2 information leaflet\$1).mp.
62. (patient\$1 adj2 medication adj2 sheet\$1).mp.
63. 60 or 61 or 62
64. 63 and (56 or 55)
65. 64 or 59
66. limit 65 to english language
67. limit 66 to yr=1970-2004

Cochrane Library 2004, Issue 4, searched November 2004 (including CDSR, CCTR, NHS CRD DARE, NHS EED and HTA database)

- #1. MeSH descriptor Drug Therapy explode all trees in MeSH products
- #2. MeSH descriptor Pharmaceutical Preparations explode all trees in MeSH products
- #3. MeSH descriptor Pharmaceutical Services explode all trees in MeSH products
- #4. MeSH descriptor Medication Systems explode all trees in MeSH products
- #5. MeSH descriptor Pharmacists explode all trees in MeSH products
- #6. MeSH descriptor Drug Utilization explode all trees in MeSH products
- #7. MeSH descriptor Patient Compliance explode tree 2 in MeSH products
- #8. drug or drugs or prescription* or prescribing or nonprescription or otc or "over the counter" in Abstract or drug or drugs or prescription* or prescribing or

- nonprescription or otc or "over the counter" in Record Title, from 1800 to 2004 in all products
- #9. pharmacy or pharmacies or pharmacist* or compliance or noncompliance or non-compliance in Abstract or pharmacy or pharmacies or pharmacist* or compliance or noncompliance or non-compliance in Record Title, from 1800 to 2004 in all products
- #10. (#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9)
- #11. MeSH descriptor Drug Labeling explode all trees in MeSH products
- #12. MeSH descriptor Drug Packaging, this term only in MeSH products
- #13. MeSH descriptor Pamphlets, this term only in MeSH products
- #14. MeSH descriptor Reading, this term only in MeSH products
- #15. MeSH descriptor Product Labeling, this term only in MeSH products
- #16. MeSH descriptor Comprehension, this term only in MeSH products
- #17. drug* NEAR/3 label* in Abstract or drug* NEAR/3 label* in Record Title, from 1800 to 2004 in all products
- #18. pamphlet* or booklet* or leaflet* or brochure* in Abstract or pamphlet* or booklet* or leaflet* or brochure* in Record Title, from 1800 to 2004 in all products
- #19. "medicines information" or "medicines education" in Abstract or "medicines information" or "medicines education" in Record Title, from 1800 to 2004 in all products
- #20. "patient information" or "consumer information" in Abstract or "patient information" or "consumer information" in Record Title, from 1800 to 2004 in all products
- #21. "written information" or "printed information" in Abstract or "written information" or "printed information" in Record Title, from 1800 to 2004 in all products
- #22. readability in Abstract or readability in Record Title, from 1800 to 2004 in all products
- #23. (#11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22)
- #24. (#10 AND #23)
- #25. patient information leaflet* in Abstract or patient information leaflet* in Record Title, from 1800 to 2004 in all products
- #26. PILs or PILS or PIL in Abstract or PILs or PILS or PIL in Record Title, from 1800 to 2004 in all products
- #27. "medication* information" or "patient medication sheet*" in Abstract or "medication* information" or "patient medication sheet*" in Record Title or prescription NEAR/3 information NEAR/3 sheet* or prescription NEAR/3 information NEAR/3 leaflet* in Abstract or prescription NEAR/3 information NEAR/3 sheet* or prescription NEAR/3 information NEAR/3 leaflet* in Record Title, from 1800 to 2004 in all products
- #28. (#25 OR #26 OR #27)
- #29. (#10 OR #23)
- #30. MeSH descriptor Patient Education explode all trees in MeSH products
- #31. "patient education" or "patient information" or "consumer information" in Abstract or "patient education" or "patient information" or "consumer information" in Record Title, from 1800 to 2004 in all products
- #32. (#30 OR #31)
- #33. (#29 AND #32)
- #34. (#24 OR #33)
- #35. (#34), from 1970 to 2004

Digital Dissertations 1970–2004, searched November 2004

1. bi(patient information leaflets or patient information leaflet)
2. bi (drug or drugs or medication or medications or pharmaceutical or prescription or non-prescription)
3. bi(label or labels or labelling or labeling)
4. bi(packaging or packet or packets)
5. bi(pamphlet or pamphlets or leaflet or leaflets or booklet or booklets or brochure or brochures or sheet or sheets)
6. bi(medicines or pharmacy or pharmacies or pharmacists)
7. #2 or #6
8. bi(reading or written or print or printed or readability)
9. #8 or #3 or #4 or #5
10. #9 or #7
11. bi(consumer health information)
12. bi(consumer health information or patient information or written information or printed information or package inserts or prescription information leaflets or patient medication sheets or drug information)

13. bi(package insert or consumer information or prescription information leaflet or patient medication sheet)
14. bi(prescription information leaflets or patient medication sheets or prescription information leaflets or patient medication sheet)
15. #12 or #13
16. #15 or #7
17. #16 or #14 or #10 or #1
18. bi(patient education)
19. #18 and (#15 or #9 or #7)
20. #17 or #19

EMBASE 1980–2004, OVID, searched September 2004

1. exp Drug Therapy/
2. exp Drug/
3. exp Pharmacy/
4. exp "Drug Use"/
5. exp Pharmacist/
6. exp Prescription/
7. Adverse Drug Reaction/
8. exp Drug Utilization/
9. exp Self medication/
10. Patient Compliance/
11. prescrib\$.ti,ab.
12. prescription\$1.ti,ab.
13. nonprescription\$1.ti,ab.
14. over the counter.ti,ab.
15. ((OTC or otc) not (organotin or ornithine or oxytetracycline)).mp
16. dispens\$.mp
17. pharmaceutical\$1.ti,ab.
18. drug\$1.ti,ab.
19. medication\$1.mp
20. complian\$.mp
21. (noncomplian\$ or non-complian\$ or non complian\$).mp
22. comply\$.mp
23. (concordance not twin\$1).mp
24. (adher\$ not leukocyt\$).mp
25. treatment refusal.mp
26. self-administ\$.mp
27. Drug Labeling/
28. exp Drug Packaging/
29. Drug Information/
30. Medical Information/
31. (drug\$1 adj2 label?ing).mp
32. pamphlet\$1.ti,ab.
33. (medicines adj2 information).ti,ab.
34. leaflet\$1.ti,ab.
35. (medicines adj2 education).ti,ab.
36. Patient Information/
37. (patient\$1 adj information).ti,ab.
38. (consumer\$1 adj2 information).ti,ab.

39. (written adj2 information).mp
40. (print\$ adj2 information).ti,ab.
41. readability.ti,ab.
42. booklet\$1.ti,ab.
43. brochure\$1.ab,ti.
44. Consumer/
45. (package\$1 adj2 insert\$1).mp
46. (prescri\$ adj2 information leaflet\$1).mp
47. (patient\$1 adj2 medication adj2 sheet\$1).mp
48. or/1-26
49. or/27-47
50. 48 and 49
51. limit 50 to english language

Health Management Information Consortium DATABASE (HMIC) 1970–2004, OVID, searched October 2004

1. exp Drug Therapy/
2. exp Drug/
3. exp Pharmacy/
4. exp "Drug Use"/
5. exp Pharmacist/
6. exp Prescription/
7. Adverse Drug Reaction/
8. exp Drug Utilization/
9. exp Self medication/
10. Patient Compliance/
11. prescrib\$.ti,ab.
12. prescription\$1.ti,ab.
13. nonprescription\$1.ti,ab.
14. over the counter.ti,ab.
15. ((OTC or otc) not (organotin or ornithine or oxytetracycline)).mp
16. dispens\$.mp
17. pharmaceutical\$1.ti,ab.
18. drug\$1.ti,ab.
19. medication\$1.mp
20. complian\$.mp
21. (noncomplian\$ or non-complian\$ or non complian\$).mp
22. comply\$.mp
23. (concordance not twin\$1).mp
24. (adher\$ not leukocyt\$).mp
25. treatment refusal.mp
26. self-administ\$.mp
27. Drug Labeling/
28. exp Drug Packaging/
29. Drug Information/
30. Medical Information/
31. (drug\$1 adj2 label?ing).mp
32. pamphlet\$1.ti,ab.
33. (medicines adj2 information).ti,ab.
34. leaflet\$1.ti,ab.

35. (medicines adj2 education).ti,ab.
36. Patient Information/
37. (patient\$1 adj information).ti,ab.
38. (consumer\$1 adj2 information).ti,ab.
39. (written adj2 information).mp
40. (print\$ adj2 information).ti,ab.
41. readability.ti,ab.
42. booklet\$1.ti,ab.
43. brochure\$1.ab,ti.
44. Consumer/
45. (package\$1 adj2 insert\$1).mp
46. (prescri\$ adj2 information leaflet\$1).mp
47. (patient\$1 adj2 medication adj2 sheet\$1).mp
48. or/1-26
49. or/27-47
50. 48 and 49
51. limit 50 to english language

Index to Theses 1970–2004, Expert Information Ltd, searched October 2004

- Contents patient information leaflet* OR
 Ti patient information leaflet* OR
 Ti package insert* or contents package insert* OR
 Ti patient information and Ti medication OR
 Ti patient information and Ti medicine* or Ti
 drug* OR
 Ti patient information and Ti pamphlet* OR
 Ti patient information and Contents leaflet* OR
 Ti patient information and Contents sheet* OR
 Ti patient information and Contents written OR
 Ti patient information and Contents readability
 OR
 Ti patient information and Contents pharm OR
 Ti patient information and Contents prescription
 OR
 Ti patient information and Contents
 nonprescription OR
 Ti patient information and Contents "over the
 counter" OR
 Ti patient education and Contents "over the
 counter" OR
 Ti patient education and Contents non-
 prescription OR
 Ti patient education and Contents prescription
 OR
 Ti patient education and Contents pharm* OR
 Ti patient education and Contents written OR
 Ti patient education and Contents print* OR
 Ti patient education and Contents medicine* OR
 Ti patient education and Contents pamphlet* OR
 Ti patient education and Contents medicine* OR
 Ti patient education and Contents drug* OR
 Ti prescription information leaflet* or Contents
 prescription information leaflet* OR

- Ti patient medication sheet* or Contents patient
 medication sheet* OR
 Ti patient education or patient information or
 consumer information or consumer OR health
 information and Contents label* OR
 Ti patient education or patient information or
 consumer information or consumer health
 information and Contents pamphlet* OR
 Ti patient education or patient information or
 consumer information or consumer health
 information and Contents written information
 OR
 Ti patient education or patient information or
 consumer information or consumer health
 information and Contents print* information
 OR
 Ti patient education or patient information or
 consumer information or consumer health
 information and Contents booklet

ISI Proceedings 2000–2004, searched October 2004

Using same strategy as for Web of Science (see
 below)

MEDLINE 1970–2004, OVID, searched October 2004

1. exp Drug Therapy/
2. exp Pharmaceutical Preparations/
3. exp Pharmaceutical Services/
4. exp Medication Systems/
5. exp Pharmacists/
6. exp Prescriptions, Drug/
7. exp Drugs, Non-Prescription/
8. exp Drug Utilization/
9. exp Self medication/
10. Patient Compliance/
11. Treatment Refusal/
12. prescrib\$.ti,ab.
13. prescription\$1.ti,ab.
14. nonprescription\$1.ti,ab.
15. over the counter.ti,ab.
16. ((OTC or otc) not (organotin or ortnithine or
 oxytetracycline)).mp.
17. dispens\$.mp.
18. pharmaceutical\$1.ti,ab.
19. drug\$1.ti,ab.
20. medication\$1.mp.
21. complian\$.mp.
22. (noncomplian\$ or non-complian\$ or non
 complian\$).mp.
23. comply\$.mp.
24. (concordance not twin\$1).mp.

25. (adher\$ not leukocyt\$).mp.
26. treatment refusal.mp.
27. self-administ\$.mp
28. or/1-27
29. Drug Labeling/
30. exp Drug Packaging/
31. Pamphlets/
32. Product Labeling/
33. (drug\$1 adj2 label?ing).mp.
34. pamphlet\$1.ti,ab.
35. (medicines adj2 information).ti,ab.
36. leaflet\$1.ti,ab.
37. (medicines adj2 education).ti,ab.
38. (patient\$1 adj2 information).ti,ab.
39. (consumer\$1 adj2 information).ti,ab.
40. (written adj2 information).mp
41. (print\$ adj2 information).ti,ab.
42. booklet\$1.ti,ab.
43. brochure\$1.ab,ti.
44. or/29-43
45. exp Patient education/
46. 28 or 44
47. 45 and 46
48. 28 and 44
49. 47 or 48
50. (package\$1 adj2 insert\$1).mp
51. (prescri\$ adj2 information leaflet\$1).mp.
52. (patient\$1 adj2 medication adj2 sheet\$1).mp
53. 50 or 51 or 52
54. 53 and (46 or 45)
55. 54 or 49
56. limit 55 to english language
57. limit 56 to yr=1970-2004

Pharmline 1978–2004, Web version, searched October 2004

1. "Drug Therapy" OR "Drug Therapy-combination" OR "Self Administration" OR "Self Medication" OR "Drug Education" OR "Pharmacodynamics" OR "Drug Tolerance" OR "Drug Interactions" OR "Sex Factors" OR "Age Factors" OR "Cross Reactions" OR "Delayed Effect" OR "Dose Response Relationship-drug" OR "Drug Antagonism" OR "Drug Effects-central" OR "Drug Effects-peripheral" OR "Drug Food Interactions" OR "Drug Incompatibilities" OR "Medicines Information Services" OR "Medicines Information" OR "Medicines Information Centres" OR "Drug Storage" OR "Drug Packaging" OR "Ampoules" OR "Cartridges" OR "Child Resistant Containers" OR "Patient Packs" OR "Unit Dose Packaging" OR "Controlled Dosage Systems" OR "Drug Utilisation" OR "Drugs" OR "Antirheumatic

Agents" OR "Drugs-prescribed" OR "Drugs-over the Counter" OR "New Products" OR "Drugs-generic" OR "Drugs-orphan" OR "Drugs-investigational" OR "Antirheumatic Agents" OR "Anti-allergics" OR "Histamine H1 Blockers" OR "Drugs-antihistamine and Anti-allergic" OR "Antibiotics" OR "Antituberculars" OR "Antivirals" OR "Antifungals" OR "Trimethoprim and Analogues" OR "Antileptotics" OR "Drugs-anti-infective" OR "Immunosuppressants" OR "Antineoplastics" OR "Drugs-antineoplastic and Immunosuppressant" OR "Calcium Antagonists" OR "Sympathomimetics" OR "Vasodilators" OR "Inotropics-positive" OR "Antihypertensives" OR "Anti-arrhythmics" OR "Anti-anginals" OR "Vasoconstrictors" OR "Angiotensin Converting Enzyme Inhibitors" OR "Sclerosants" OR "Sympatholytics" OR "Rutoside" OR "Alprostadil" OR "Drugs-cardiovascular" OR "Generic Substitution" OR "Patient Compliance" OR "Adherence" OR "Compliance Aids"

2. patient information or consumer information or health information
3. patient education
4. patient safety or writing or reading
5. information presentation or readability or package insert*
6. labelling or labelling
7. label*
8. pharmacist* or pharmacies
9. written information or pamphlet* or printed information
10. information leaflet* or information sheet*
11. patient information leaflet*
12. PILs or PIL
13. patient medication sheet* or prescription information leaflet*
14. 1 and (2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13)

PsycINFO 1970–2004, OVID, searched October 2004

1. exp Drug Therapy/
2. Drug usage/
3. exp Self Medication/
4. exp Drugs/
5. "Prescribing (drugs)"/
6. exp treatment Compliance/
7. exp Treatment Refusal/
8. Side Effects, Drug/
9. prescrib\$.ti,ab.
10. prescription\$1.ti,ab.
11. nonprescription\$1.ti,ab.

12. over the counter.ti,ab.
13. ((OTC or otc) not (organotin or ornithine or oxytetracycline)).mp.
14. dispens\$.mp.
15. pharmaceutical\$1.ti,ab.
16. drug\$1.ti,ab.
17. medication\$1.mp.
18. complian\$.mp.
19. (noncomplian\$ or non-complian\$ or non complian\$).mp.
20. comply\$.mp.
21. (concordance not twin\$1).mp.
22. (adher\$ not leukocyt\$).mp.
23. treatment refusal.mp.
24. self-administ\$.mp.
25. Reading/
26. Readability/
27. Reading Comprehension/
28. Written Communication/
29. Information Seeking/
30. Printed Communications Media/
31. Literacy/
32. Reading Materials/
33. (drug\$1 adj2 label?ing).mp.
34. pamphlet\$1.ti,ab.
35. (medicines adj2 information).ti,ab.
36. leaflet\$1.ti,ab.
37. (medicines adj2 education).ti,ab.
38. (patient\$1 adj2 information).ti,ab.
39. (consumer\$1 adj2 information).ti,ab.
40. (written adj2 information).mp.
41. (print\$ adj2 information).ti,ab.
42. booklet\$1.ti,ab.
43. brochure\$1.ab,ti.
44. exp Client Education/
45. (package\$1 adj2 insert\$1).mp.
46. (prescri\$ adj2 information leaflet\$1).mp.
47. (patient\$1 adj2 medication adj2 sheet\$1).mp.
48. or/1-24
49. or/25-47
50. 48 and 49
51. limit 50 to english language
52. limit 51 to yr=1970-2004

Sociological Abstracts 1970–20 October 04, CSA, searched October 2004

1. (DE=(medications or pharmacy or pharmacists or treatment compliance) or KW=(prescrib* or prescription* or nonprescription or over within2 counter or OTC or drug* or medication* or compliance or noncompliance)) AND (DE=(information dissemination or readability or information sources or documents) or KW=(readability or pamphlet*

or leaflet* or booklet* or brochure* or written within3 information or print* within2 information or medicines education or drug within2 label* or medicines information or patient information or consumer information))

OR

2. KW=((patient information within 3 leaflet*) or (prescription within 3 information within 3 sheet*) or (patient within 3 medication sheet*))

Web of Science 1975–2004, ISI Web of Knowledge, searched October 2004

Databases: SCI-EXPANDED, SSCI, A&HCI

- #1 TS=(patient information leaflet*) or TI=(patient information leaflet*)
- #2 TS=(patient information sheet*) or TI=(patient information sheet*)
- #3 TS=(patient medication sheet*) or TI=(patient medication sheet*)
- #4 TS=(consumer health information) or TI=(consumer health information)
- #5 TS=(patient information) or TI=(patient information)
- #6 TS=(patient education) or TI=(patient education)
- #7 TS=(consumer education) or TI=(consumer education)
- #8 TS=(medicines information) or TI=(medicines information)
- #9 #4 or #5 or #6 or #7 or #8
- #10 TS=(drug or drugs or pharmacy or pharmacist*) or TI=(drug or drugs or pharmacy or pharmacist*)
- #11 #10 and #9
- #12 #1 or #2 or #3
- #13 TS=(medication or prescription or nonprescription) or TI=(medication or prescription or nonprescription)
- #14 #9 and #13
- #15 #14 not #12
- #16 #15 not #11
- #17 TS=(package same insert*) or TI=(package same insert*)
- #18 #17 and (#9 or #10 or #13)
- #19 TS=(written drug information) or TI=(written drug information)
- #20 TS=(PILs or PIL) or TI=(PILs or PIL)
- #21 (#9 or #10 or #13) and #20
- #22 TS=(PPIs or PPI) or TI=(PPIs or PPI)
- #23 #22 and (#9 or #10 or #13)
- #24 TS=(proton* or pyrophosphate* or peanut* or positron*)
- #25 #23 not #24

- #26 TS=(patient medication leaflet*) or
TI=(patient medication leaflet*)
- #27 TS=(readability) or TI =(readability)
- #28 (#9 or #10 or #13) and #27
- #29 ts=(health literacy) or ti=(health literacy)
- #30 (#9 or #10 or #13) and #29
- #31 #30 or #28
- #32 ts=(pamphlet* or brochure* or leaflet* or
booklet* or internet or sheet*) or
ti=(pamphlet* or brochure* or leaflet* or
booklet* or internet or sheet*)
- #33 #10 or #13
- #34 #33 and #32
- #35 ts=(label*) or ti=(label*)
- #36 (#10 or #13) and #9
- #37 #36 and #35
- #38 ts=(consumer label*) or ti==(consumer
label*)
- #39 #11 or #12 or #16 or #18 or #19 or #21
or #25 or #26 or #31 or #34 or #37 or #38

Known papers used to refine MEDLINE search strategy

Amery WK, Van Winkel M. Patient package inserts for prescription drugs in an international pharmaceutical company. *Drug Inf J* 1995;**29**:51–60.

Bernardini C, Ambrogi V, Perioli L, Tiralti MC, Fardella G. Comprehensibility of the package leaflets of all medicinal products for human use: a questionnaire survey about the use of symbols and pictogram. *Pharmacol Res* 2000;**41**:679–88.

Blattmann P. Patient product information (PPI) – elements for a rational approach. *Drug Inf J* 1992;**26**:271–8.

Canada AE. Improving patient compliance by packaging techniques. *Hosp Formulary* 1976;**11**:303.

Clark CM, Bayley EW. Evaluation of the use of programmed instruction for patients maintained on Warfarin therapy. *Am J Public Health* 1972;**62**:1135–9.

Clinite JC, Kabat HF. Improving patient compliance. *J Am Pharm Assoc* 1976;**16**:74–6,85.

Coulter A, Entwistle V, Gilbert D. *Informing patients: an assessment of the quality of patient information materials*. London: King's Fund; 1998.

Davis TC, Bocchini JA, Fredrickson D, Arnold C, Mayeaux EJ, Murphy PW, *et al*. Parent comprehension of polio vaccine information pamphlets. *Pediatrics* 1996;**97**:804–10.

Dixon-Woods M. The production of printed consumer health information: order from chaos? *Health Educ J* 2000;**59**:108–15.

Doucette, WR, Schommer, JC. Consumer preferences for drug information after direct-to-consumer advertising. *Drug Inf J* 1998;**32**:1081–8.

Fox LA. Written reinforcement of auxiliary directions for prescription medications. *Am J Hosp Pharm* 1969;**26**:334–41.

Hermann F, Herxheimer A, Lionel NDW. Package inserts for prescribed medicines: what minimum information do patients need? *BMJ* 1978;**2**:1132–5.

Knapp P, Raynor DK. A telephone survey of patients' use of medicine information leaflet. *Pharm J* 1999;**263**(Suppl):R40.

Morris LA, Tabak ER, Gondek K. Counseling patients about prescribed medication: 12-year trends. *Med Care* 1997;**35**:996–1007.

Peura S, Klaukka T, Hannula AM, Eerikainen S. Electronically produced information leaflets increase patients' understanding of antibiotics. *Int J Pharm Prac* 1993;**2**:22–5.

Waleed MS, Zeid A-A-N, Jaradat NA. Drug informational value of patient package insert (PPI): a sample study in Palestine. *Nat Sci Ser* 2004;**12**:59–68.

Wilson R. *PILs non-drug information leaflets – patient survey report*. Newcastle: Sowerby Centre for Health Informatics; 1998.

Winfield AJ, Owen CW. Information leaflets: a means of improving patient compliance. *Br J Pharm Pract* 1990;**12**:206–9.

Appendix 3

Inclusion and exclusion criteria for selection of studies

We based our inclusions and exclusions on the following factors: populations and settings and interventions for both strands of the review.

Time period and language

- 1970+
- English language.

Role and value study design

- Ethnography, phenomenology, grounded theory and participatory action research.
- Studies deriving qualitative data will be included if they have used an established method, such as face-to-face interviews, focus groups, direct observation or conversation.

Effectiveness study design

1. RCTs; controlled clinical trials; controlled before and after studies; interrupted time series; before and after cohort studies; other uncontrolled designs.
1. But not:
 - (a) user testing studies
 - (b) application of readability formulae.

Populations and settings

We included studies enrolling users of medicines (not differentiating between 'patients' prescribed medicine(s) and members of the general public who use over the counter medicines), and those who recruited members of the public not currently taking medicines.

We considered for inclusion studies which presented information for:

- prescription medicines
- OTC medicines
- oral contraception (including emergency hormonal contraception)
- nicotine replacement therapy.

We excluded non-drug forms of contraception and other medical devices, as these are not information about taking a medicine. We excluded complementary or alternative medicines, vaccines and diagnostic agents such as X-ray media.

We considered for inclusion studies of information for medicines for short- and long-term conditions, and also medicines provided in the following health settings:

- pharmacies
- doctors' surgeries
- hospitals (inpatient, discharge and outpatient settings)
- clinics
- supermarkets.

We also included studies of medicines obtained by:

- mail-order
- the Internet.

We included studies enrolling the general public (e.g. imagined scenario studies with hypothetical medicines). Studies of informal carers, that is, supporters of people taking medicines, were also included. We included studies enrolling professional carers such as physicians, nurses and pharmacists for the role and value review, but excluded trials which enrolled professional carers for the effectiveness review.

Type of interventions

We considered any interventions where written information (hard copy or electronic) about individual medicines was made available to people at any time after the decision had been made to prescribe or purchase a medicine. This included:

- Information leaflets for people about individual medicines or groups of medicines, whose primary focus is the medicine(s).
- Web-based information about an individual medicine or groups of medicines aimed at people taking medicines which is discrete, for example, has a specific URL or web page address.

We did not consider information on the label or packaging of the medicines, but did include studies of leaflets or other written information made available to people taking medicine(s) at (or subsequent to) the time of prescribing or purchase, including:

- computer-generated pharmacy leaflets
- information supplied from a voluntary organisation (e.g. Arthritis Care).

We excluded the following interventions:

- Information designed to inform decisions about the choice of medicine, that is, before

prescription or purchase (including decision aids).

- Condition-based, general leaflets which contain within them brief medicines information, that is, medicines information is not their primary purpose.
- Reminder charts or other text-based compliance aids.
- Information aimed at the public generally, including adverts, information about various treatments for a condition, information in the mass media or health promotion information.
- Telephone-delivered information.
- Information that solely used icons.

Appendix 4

Data extraction coding form for studies of the role and value of written medicines information

DATA EXTRACTION FORM FOR A PAPER BEING CONSIDERED FOR ROLE and VALUE IN MEDICINES INFORMATION SYSTEMATIC REVIEW			
<i>AUTHOR/TITLE OF PAPER</i>			
COUNTRY IN WHICH STUDY WAS CONDUCTED			
<i>NAME OF REVIEWER</i>			
TIME TAKEN			
<i>A. Is the paper relevant to our research question and worthy of further consideration?</i>			
Relevance. Is the paper about the role and value of written medicines information for patients?			
Worth. Does the paper go beyond superficial description or commentary – i.e. is it a broadly competent attempt at research, enquiry, investigation or study?			
<i>B. Bottom line for Medicines Information Systematic Review</i> complete this AFTER filling in section C			
1. Relevance. Does the paper have an important message for our research question?	Essential to include	Relevant but not essential	Marginal relevance
2. Methods. Does the paper fulfil the established quality criteria for papers in its domain?	Outstanding	Some limitations	Many important limitations
3. Critical factors. What role does the paper identify for written medicines information and/or the value of written information? HYPOTHETICAL OR ASSUMED			
ACTUALLY DEMONSTRATED			
SUMMARY OF LIMITATIONS			

C. Evaluation sheet		
1. Did the paper address a clear research question and if so, what was it?		
2. Was the methodology appropriate for the research question?		
Design. What was the study design and was this appropriate to the question?		
Sampling <ul style="list-style-type: none"> • Explanation of how participants were selected • Explanation of why chosen participants were most appropriate to give answer to research question • Discussion about recruitment, e.g. why some people chose not to take part 		
Method of data collection <ul style="list-style-type: none"> • Setting for data collection justified • Clear how data were collected • Justification of method chosen • Methods explicit • Methods modified during study • Form of data clear • Discussion of saturation of data 		
Reflexivity relationship between researcher and participant-research bias Did researcher critically examine their own role, potential bias and influence during: <ul style="list-style-type: none"> • Formulation of research questions • Data collection including recruitment and choice of location • Researcher response to events during the study and implications of any modifications 		

<p>Ethical issues</p> <ul style="list-style-type: none"> • Explanation of research to participants to see if ethical standards maintained • Discussion of ethical issues arising in the study • Approval sought from ethics committee 		
<p>Data analysis. Was the data analysis process systematic, thorough and auditable?</p> <ul style="list-style-type: none"> • In depth description of analysis process • Thematic analysis used? Clear how categories themes derived from data? • Explanation of how data presented were selected • Sufficient data to support findings? Did the researchers include sufficient cases/settings/observations? • Contradictory data taken into account? • Reflexivity and potential bias during data analysis 		
<p>Clear statement of findings</p> <ul style="list-style-type: none"> • Findings explicit? • Adequate discussion for and against researcher's arguments • Discussion of credibility of findings (triangulation, respondent validation, more than one analyst) • Findings discussed in relation to the original research question • Did the authors draw a clear link between data and explanation (theory)? If not, what are your reservations? • What are the main results and in what way are they surprising, interesting or suspect? 		
<p>How valuable is the research?</p> <ul style="list-style-type: none"> • Researcher discusses contribution study makes to existing knowledge/understanding, e.g. in relation to practice, policy, existing literature • Identify new areas for research • Discussed use of research findings? 		

Appendix 5

Data extraction coding form for trials of written medicines information effectiveness

Banner row: bibliographic information

- Authors and year – remember there may be more than one study by the same authors in the same year, hence why we note the unique Endnote identifier number for each paper.
- Funding source for the study, (e.g.) HTA or MRC.
- Study design – need only note if it is a 'less common' RCT design, e.g. factorial or cluster randomised.

Columns

1. Intervention

- Brief summary of the intervention and control (e.g.) 2 pp. medical information leaflet closely modelled on EU regulations.
- Succinctly report what the information involved:
 - Record if the information was about a real or hypothetical medicine and report name of medicine.
 - Record who gave subjects the WMI, in what environment, and for what length of time.
 - Note if the paper did or did not provide a copy of the leaflet.
 - Note if the intervention had a rationale: (theory or evidence based).
 - Note the language of the WMI.
- Record in a similar fashion the control condition.
- Note length of follow-up.

2. Participants' characteristics

- Country of study.
- Age range of subjects and any medical condition (if relevant), or if wearing glasses.
- Most common language of subjects, and note other languages spoken.
- Inclusion and exclusion criteria of subjects stated in paper (if any).

3. Demographic data

- *N* – the number of participants enrolled at the start of the study.
- Age – mean age (age range).
- Male % – at start of the study.

- Ethnic % – at start of the study for any groups mentioned.
- Education – the subjects' education background, by % if possible (e.g. 15% no formal education qualifications).
- Baseline measure – corresponding to outcome measure(s).

4. Quality assessment

[Based on CRD guidelines and Delphi list Quality Assessment of RCTs]

- Baseline comparability – this relates to comparability at baseline for 'most important prognostic indicators': age, sex, education, previous medication taken, etc.
 - Yes – report for what variables.
 - No – report for what variables.
 - Unclear or not reported – not reported.
- Blinding – in trials of an information intervention, it is usually possible to blind only the outcome assessor to the intervention given. If the intervention being compared is real vs sham PIL, it may be possible to blind the subject (but not the treatment provider). So if the outcome assessor is blinded, report as such; otherwise state 'not reported' (if relevant), or none.
- Randomisation – this relates to the process of allocation to the intervention.
 - Adequate – if computer-generated, table of random numbers, coin tossing, shuffling cards, throwing dice, etc.; i.e. the result cannot be anticipated
 - Inadequate – if according to date of birth, date of admission, alternation, case record, etc.; i.e. something which can be anticipated.
 - Not reported – if not clearly reported.
- Concealment – this relates to the process of concealing the allocation process from the investigator, so that it cannot be subverted.
 - Adequate – if performed at a central site remote from the study location.
 - Inadequate – if there is an open allocation sequence, or if it uses unsealed envelopes, non-opaque or opaque envelopes.
 - Not reported – if not clearly reported.

Authors and year; Funding source					
Intervention	Participants' characteristics	1. Number 2. Age (range) 3. Male % 4. Ethnic % 5. Education 6. Baseline measure	1. Baseline comparability 2. Blinding 3. Randomisation 4. Concealment 5. Loss to follow-up 6. Any other comments	1. Outcome measure 2. Withdrawal	
<p>I: <ul style="list-style-type: none"> Real/fictitious WMI provided by, length of time, environment Content of WMI </p> <p>C: <ul style="list-style-type: none"> Same as for I: </p> <p>Study drug. Copy of intervention provided in paper? Language of intervention Theory/evidence based? Length of follow-up of trial</p>	<ul style="list-style-type: none"> Country Age (inclusion age range), medical condition, glasses Language Inclusion, exclusion criteria 	<ol style="list-style-type: none"> 	<ol style="list-style-type: none"> Yes/no/not reported Outcome assessor/not reported/none Adequate/inadequate/unclear Adequate/inadequate/unclear I: n/N (%) C: n/N (%) E.g. have interventions been aggregated over a variable for analysis, was study underpowered, were findings generalisable, etc. 	<ol style="list-style-type: none"> Trial specific outcome measure End-point I: N (%) C: N (%) <p>Change score I: N (%) C: N (%)</p> <ol style="list-style-type: none"> I: n/N (%) C: n/N (%) 	

We recorded whether trials reported loss to follow-up, i.e. how many participants did not have a final outcome measure. We reported this separately for each intervention arm, if possible, or for the total number of participants in the trial.

- Any other comments – e.g. was study under-powered, were findings generalisable, etc.

5. Outcome data

- Outcome measures – record these for intervention and control. Specific outcome

measures are likely to relate to one of three categories.

- Patient medicine-related knowledge – e.g. recognition of medicine side-effects.
- Patient medicine-related behaviour – e.g. adherence with recommended instructions for proper medication use.
- Patient medicine-related attitudes – e.g. satisfaction with information.
- Note which measures are used recording the endpoint and/or change score data for both groups.
- Withdrawals from each group.

Appendix 6

Effectiveness results

Outcomes in trials measuring knowledge

Trial	How measured	Follow-up	Intervention(s)	Control	Sample size calculation included	Reported statistical significance
Dodds, 1986 ⁶⁷	Median recall of information essential to correct drug taking	3 months	7/10, <i>n</i> = 31	4/10, <i>n</i> = 30	Yes	<i>p</i> = 0.0001
Gibbs <i>et al.</i> , 1989 ⁷⁹	Overall patient knowledge	10 weeks			No	
	Name medicine		275/419 (65.6%)	220/300 (73.3%)		
	Therapy purpose		408/419 (97.4%)	284/300 (94.7%)		
	When to take it		352/419 (84.0%)	222/300 (74.0%)		
	Take with fluid		342/419 (81.6%)	183/300 (61.0%)		
	Take with food		304/419 (72.6%)	185/300 (61.7%)		
	Action if miss dose		288/419 (68.7%)	216/300 (72.0%)		
	Store out of reach		349/419 (83.3%)	227/300 (75.7%)		
	Safe disposal method		316/354 (89.3%)	176/200 (88.0%)		
	Aware not to share medicines		204/232 (87.9%)	89/100 (89.0%)		
	Overall patient awareness of side-effects		160 (38.2%) <i>n</i> = 419	45 (15.0%) <i>n</i> = 300		
Johnson <i>et al.</i> , 1986 ⁸⁰	End-point and change score of knowledge of drug	1 month	4.8 (SD 1.3), <i>n</i> = 18 + 1.1 (SD 1.7)*	4.5 (SD 1.3), <i>n</i> = 20 0 (SD 0.9)	No	* <i>p</i> < 0.05
Kumana <i>et al.</i> , 1988 ⁸¹	End-point and difference in patient knowledge on 10 questions	3 months	5.8 (SD 2.3), <i>n</i> = 56 + 1.3 (SD 1.9)	6.3 (SD 2.0), <i>n</i> = 51 + 1.2 (SD 2.6)	No	<i>p</i> = NS
McBean and Blackburn, 1982 ⁸²	Subjects' knowledge at follow-up (^a difference from baseline)	3 weeks	49.0% (+4) ^a <i>n</i> = ?	40.0% (+6) ^a <i>n</i> = ?	No	

continued

Trial	How measured	Follow-up	Intervention(s)	Control	Sample size calculation included	Reported statistical significance
Morris and Kanouse, 1982 ⁸³	Mean number of side-effects correctly named after 2nd follow-up (17 possible side-effects)	3 months	2.9, <i>n</i> = 144	2.2, <i>n</i> = 69	Yes	
	Mean number of side-effects incorrectly named after 2nd follow-up (17 possible side-effects)		0.15, <i>n</i> = 144	0.12, <i>n</i> = 69		
Weiderholt and Kotzan, 1983 ⁸⁶	Knowledge and comprehension examination: Kuder–Richardson formula 20 (maximum possible score = 11)	Not reported	7.7, <i>n</i> = 67	4.3, <i>n</i> = 69	No	
Arthur and Clifford, 1998 ⁸⁷	No. who identified drug as NSAID:	8–12 weeks			No	
	Naprosyn		14/38 (37%)	5/36 (14%)		<i>p</i> < 0.001
	Indomethacin		10/38 (26%)	5/36 (14%)		<i>p</i> < 0.001
	Ibuprofen		22/38 (58%)	14/36 (39%)		<i>p</i> < 0.01
	Naproxen		12/38 (32%)	6/36 (17%)		<i>p</i> < 0.001
	Nabumetone		11/38 (29%)	8/36 (22%)		<i>p</i> < 0.01
	Ketoprofen		5/38 (13%)	5/36 (14%)		<i>p</i> = NS
	Diclofenac		16/38 (42%)	9/36 (25%)		<i>p</i> < 0.001
	Relifex		10/38 (26%)	10/36 (28%)		<i>p</i> < 0.01
	Brufen		23/38 (61%)	19/36 (53%)		<i>p</i> < 0.001
	Indocid		11/38 (29%)	3/36 (8%)		<i>p</i> < 0.01
	Volterol		25/38 (66%)	19/36 (53%)		<i>p</i> < 0.001
Oruvail	7/38 (18%)	7/36 (19%)	<i>p</i> = NS			
Baker et al., 1991 ⁸⁸	Recall information before leaving hospital:	2 weeks			No	
	Treatment purpose		43/49 (87.8%)	21/52 (40.4%)		<i>p</i> < 0.001
	Action if miss dose		30/49 (61.2%)	4/52 (7.6%)		<i>p</i> < 0.001
	Possible side-effects		34/49 (69.4%)	7/52 (13.5%)		<i>p</i> < 0.001
	Action re side-effects		26/49 (53.1%)	2/52 (3.8%)		<i>p</i> < 0.001
	When to take drug		46/49 (93.9%)	46/52 (88.5%)		<i>p</i> = NS
	How to take drug		38/49 (77.6%)	35/52 (67.3%)		<i>p</i> = NS
	Whether you can drive		18/49 (36.7%)	14/52 (26.9%)		<i>p</i> = NS
	Whether you can drink alcohol		30/49 (61.2%)	16/52 (30.8%)		<i>p</i> = NS
Peura et al., 1993 ⁸⁹	Participants know: What to do if miss a dose	Unclear	194/218 (89%)	129/195 (66%)	No	<i>p</i> < 0.001
	Tablet taken with water		211/218 (97%)	181/195 (93%)		<i>p</i> = NS
	Recommendations for drinking alcohol and medication		139/218 (64%)	51/195 (26%)		<i>p</i> < 0.001

continued

Trial	How measured	Follow-up	Intervention(s)	Control	Sample size calculation included	Reported statistical significance
	Can take sauna during medication		198/218 (91%)	170/195 (87%)		$p = \text{NS}$
	Name at least 1 correct side-effect		183/218 (84%)	97/195 (50%)		$p < 0.001$
Pope <i>et al.</i> , 1998 ⁹⁰	No. of side-effects listed for NSAIDs	111 days	0.6 (SD 0.8), $n = 34$	1.2 (SD 1.1), $n = 37$	No	$p = 0.02$
	No. of correct side-effects		0.5 (SD 1.1), $n = 34$	0.8 (SD 0.6), $n = 37$		$p = 0.09$
	Correctly identify: Don't take NSAID on empty stomach		29/30 (96.7%)	35/35 (100%)		$p = 0.06$
	NSAIDs help with pain		29/33 (87.9%)	23/34 (67.6%)		$p < 0.05$
	Don't take ASA with NSAID		16/31 (51.6%)	20/36 (55.6%)		$p = 0.9$
	NSAIDs decrease inflammation		28/33 (84.9%)	33/36 (91.7%)		$p = 0.3$
	NSAIDs rarely cause a rash		13/33 (39.4%)	14/36 (38.9%)		$p = 0.9$
	NSAIDs can cause an ulcer		29/34 (85.3%)	24/33 (72.7%)		$p = 0.1$
	NSAIDs can cause GI bleed		16/33 (48.5%)	14/36 (38.9%)		$p = 0.5$
	Call GP if heartburn occurs		16/32 (50.0%)	21/37 (56.8%)		$p = 0.5$
	Call GP if black bowel movement		27/34 (79.4%)	29/37 (78.4%)		$p = 0.9$
Regner <i>et al.</i> , 1987 ⁹²	Recognition of side-effects caused by the medication	17 days	1.8 (SD 1.2), $n = 1595\%$ CI: 1.2 to 2.4	0.8 (SD 0.8), $n = 19$ 95% CI: 0.5 to 1.2	No	$p \leq 0.05$
Savas and Evcik, 2001 ⁹¹	No. of correct answers: 8-question questionnaire	7–10 days	6.8 (SD 0.9), $n = 31$	5.2 (SD 1.5), $n = 30$	No	$p = 0.0001$
Strydom and Hall, 2001 ⁹³	Patient knowledge at follow-up	5 weeks	6.8 (SD 2.1) $n = 24$	6.9 (SD 2.3) $n = 26$	No	95% CI difference of means: -1.4 to 1.2 $p = 0.89$
Young and Brooks, 1986 ⁹⁴	Patient knowledge bespoke test (maximum score = 17) (^a difference from baseline)		14.5 (SD 2.5) $n = 10$ (+5.0) ^a	10.9 (SD 2.6) $n = 8$ (-0.2) ^a	No	$p < 0.015$
	Improved knowledge score pre-post test		10/10 people	3/8 people		

continued

Trial	How measured	Follow-up	Intervention(s)	Control	Sample size calculation included	Reported statistical significance
Morris and Kanouse, 1981 ⁹⁷	% giving the correct answer re tone	Not reported			No	
	Side-effect		48.0%	60.0%		$p < 0.01$
	Reducing side-effects		81.0%	83.0%		$p = \text{NS}$
	Child use		74.0%	83.0%		$p < 0.05$
	Time to work		83.0%	76.0%		$p < 0.10$
	'Hangover effect'		87.0%	87.0%		$p = \text{NS}$
	Dependency		71.0%	70.0%		$p = \text{NS}$
	Effects more noticeable		76.0%	76.0%		$p = \text{NS}$
	Seek more information		86.0%	77.0%		$p < 0.05$
	Not falling asleep		82.0%	88.0%		$p = \text{NS}$
Long time taken		87.0%	94.0%		$p < 0.05$	
Quaid <i>et al.</i> , 1990 ⁹⁸	Mean no side-effects recalled	6 weeks	3.57 (SD 2.7), $n = 14$	2.29 (SD 1.6), $n = 14$	No	$p < 0.05$
Clark and Bayley, 1972 ¹⁰¹	Understanding of the use of the drug – possible score is 15	24–72 h	Intervention 1: 13.9 (SD 1.7), $n = 15$	C: 10.3 (SD 3.6), $n = 15$	No	$p = 0.035$ (Intervention I and C) $p = 0.08$ (Intervention I and Intervention 2)
			Intervention 2: 11.1 (SD 3.1) $n = 15$			
Dolinsky <i>et al.</i> , 1983 ¹⁰²	Correct recognition of drug information				No	
	Ampicillin Maximum score is 1.00		Intervention 1: 0.868 (SD 0.01), $n = 19$ Intervention 2: 0.851 (SD 0.14), $n = 18$	C: 0.813 (SD 0.11), $n = 14$		$p = \text{NS}$
	Methyldopa Maximum score is 1.00		Intervention 1: 0.771 (SD 0.2), $n = 28$ Intervention 2: 0.776 (SD 0.2), $n = 29$	C: 0.770 (SD 0.15), $n = 27$		$p = \text{NS}$
	Correct application of drug information					
	Ampicillin Maximum score is 9		Intervention 1: 4.75 (SD 2.02), $n = 16$ Intervention 2: 4.88 (SD 2.18), $n = 17$	C: 5.11 (SD 2.63), $n = 18$		$p = \text{NS}$
	Methyldopa Maximum score is 13		Intervention 1: 8.66 (SD 2.78), $n = 32$ Intervention 2: 8.36 (SD 2.87), $n = 28$	C: 8.40 (SD 2.66), $n = 25$		$p = \text{NS}$

continued

Trial	How measured	Follow-up	Intervention(s)	Control	Sample size calculation included	Reported statistical significance
Little <i>et al.</i> , 1998 ¹⁰³	Patient knowledge (getting all questions correct)	3 months	Intervention 1: 52/157 (33.1%) Intervention 2: 44/186 (23.7%)	C: 35/180 (19.4%)	Yes	
Vander Stichele <i>et al.</i> , 2002 ¹⁰⁴	Median no. of correct answers out of 20 questions	1 day			No	
	Cisapride		Intervention 1: 9/20 (45.0%), <i>n</i> = 29 Intervention 2: 8/20 (40.0%), <i>n</i> = 31	C: 2/20 (10.0%) <i>n</i> = 29		<i>p</i> < 0.05 C: and Intervention 1 or Intervention 2
	Itraconazole		Intervention 1: 16/20 (80.0%), <i>n</i> = 34 Intervention 2: 15/20 (75.0%), <i>n</i> = 34	C: 5/20 (25.0%) <i>n</i> = 34		<i>p</i> < 0.05 between C: and Intervention 1 or Intervention 2
	Risperidon		Intervention 1: 13/20 (65.0%), <i>n</i> = 30 Intervention 2: 14/20 (70.0%), <i>n</i> = 27	C: 8/20 (40.0%) <i>n</i> = 26		<i>p</i> < 0.05 between C: and Intervention 1 or Intervention 2
Berry <i>et al.</i> , 2002 ¹⁰⁵	Trial one: Probability estimates as a function of side-effect severity and mode of response	1 day	Trial one: Intervention 1: <i>n</i> = 134 'Very common' 65.6% 'Common' 45.0% 'Uncommon' 17.4% 'Rare' 8.0% 'Very rare' 3.9%	Trial one: Intervention 2: <i>n</i> = 134 'Very common' 63.9% 'Common' 43.1% 'Uncommon' 15.2% 'Rare' 6.2% 'Very rare' 2.8%	No	
	Likelihood of occurrence		Intervention 1: 4.4 (SD 1.1), <i>n</i> = 56 Intervention 2: 2.5 (SD 1.0), <i>n</i> = 56			<i>p</i> < 0.0001
	Probability of occurrence (%)		Intervention 1: 64.4 (SD 20.2), <i>n</i> = 56 Intervention 2: 20.0 (SD 11.2), <i>n</i> = 56			<i>p</i> < 0.0001
Berry <i>et al.</i> , 2002 ¹⁰⁶	Trial three: Likelihood of experiencing side-effects	1 day	Trial three: Intervention 1: 3.99 (SD 1.2) Intervention 2: 4.32 (SD 1.1) Intervention 3: 4.48 (SD 1.1)		No	Trial three: <i>p</i> < 0.001

continued

Trial	How measured	Follow-up	Intervention(s)	Control	Sample size calculation included	Reported statistical significance
Berry <i>et al.</i> , 2003 ¹⁰⁷	Trial one: Judgement of side-effects risk likelihood	1 day	Trial one: Intervention 1: 4.18 (SD 0.9) Intervention 2: 4.71 (SD 0.9)		No	Trial one: $p < 0.01$
	Trial two: Judgement of side-effects likelihood		Trial two: Intervention 1: 3.30 (SD 0.8) Intervention 2: 3.85 (SD 0.7)			Trial two: $p < 0.05$
	Total mean recall for 5 information categories		Intervention 1: 23.00 (SD 4.4) Intervention 2: 17.46 (SD 2.9)			
Berry <i>et al.</i> , 2003 ¹⁰⁸	Trial one: Mean probability judgement		Trial one: Intervention 1: 23.4 (SD 16.3) Intervention 2: 69.3 (SD 20.5)		No	Trial one: $p < 0.0001$
	Risk to health judgement		Intervention 1: 3.07 (SD 1.3) Intervention 2: 4.82 (SD 1.2)			$p < 0.001$
	Trial two: Mean estimate of probability of side-effect		Trial two: Intervention 1: 50.5% (SD 24.4) Intervention 2: 21.5% (SD 17.7) Intervention 3: 9.5% (SD 14.2) Intervention 4: 6.8% (SD 15.4)			Trial two: $p < 0.0001$
Berry, 2004 ¹⁰⁹	Likelihood of experience		Intervention 1: 4.11 (SD 1.4) Intervention 2: 4.47 (SD 1.3)		Yes	$p < 0.001$
	Risk to health		Intervention 1: 3.43 (SD 1.3) Intervention 2: 4.00 (SD 1.3)			$p < 0.001$
Berry <i>et al.</i> , 2004 ¹¹⁰	Likelihood of adverse event occurring		Intervention 1: 3.97 (SD 1.3), $n = 94$ Intervention 2: 2.61 (SD 1.2), $n = 94$		No	$p < 0.001$
	Probability estimate for side-effect (%)		Intervention 1: 56.6 (SD 23.7), $n = 94$ Intervention 2: 19.9 (SD 22.1), $n = 94$			$p < 0.001$

continued

Trial	How measured	Follow-up	Intervention(s)	Control	Sample size calculation included	Reported statistical significance
Knapp <i>et al.</i> , 2004 ¹¹¹	Pancreatitis: Estimate of adverse events occurring		Pancreatitis Intervention 1: 18.0%, <i>n</i> = 30 Intervention 2: 2.1%, <i>n</i> = 30		Yes	Pancreatitis: 95% CI: 8.2 to 23.5 <i>p</i> < 0.001
	Likelihood of occurrence Mean ratings (1–6 scale)		Intervention 1: 3.3, <i>n</i> = 30 Intervention 2: 2.4, <i>n</i> = 30			<i>p</i> = 0.006
	Constipation: Estimate of adverse events occurring		Constipation Intervention 1: 34.2%, <i>n</i> = 30 Intervention 2: 8.1%, <i>n</i> = 30			Constipation 95% CI: 15.1 to 37.0 <i>p</i> < 0.001
	Likelihood of occurrence Mean ratings (1–6 scale)		Intervention 1: 4.2, <i>n</i> = 30 Intervention 2: 2.6, <i>n</i> = 30			<i>p</i> < 0.001

Outcomes in trials measuring attitudes

Trial	How measured	Follow-up	Intervention (s)	Control	Sample size calculation included	Reported statistical significance
Gibbs <i>et al.</i> , 1989 ⁷⁹	Overall patient satisfaction response for information received	10 weeks			No	
	Complete satisfaction		294/419 (70.2%)	100/300 (33.3%)		
	Satisfaction		107/419 (25.5%)	135/300 (45.0%)		
	Indifferent		9/419 (2.1%)	22/300 (7.3%)		
	Dissatisfaction		3/419 (0.7%)	27/300 (9.0%)		
	Complete dissatisfaction		0/419 (0%)	5/300 (1.7%)		
	Don't know		6/419 (1.4%)	11/300 (3.7%)		
Baker <i>et al.</i> , 1991 ⁸⁸	Sufficient information felt to have been given	2 weeks	36/49 (73.5%)	7/52 (13.5%)	No	<i>p</i> < 0.001
	Information felt to be clear and easy to understand		44/49 (89.8%)	17/52 (32.7%)		<i>p</i> < 0.001
	Information felt to be useful or extremely useful		44/49 (89.8%)	17/52 (32.7%)		<i>p</i> < 0.001
	Felt information could be improved		13/49 (26.5%)	33/52 (63.5%)		<i>p</i> < 0.001

continued

Trial	How measured	Follow-up	Intervention(s)	Control	Sample size calculation included	Reported statistical significance
Labor <i>et al.</i> , 1995 ⁹⁵	Topics judged 'about right'	1 day	Intervention 1: 35% Intervention 2: 79% Intervention 3: 90% Intervention 4: 61% Intervention 5: 56%		No	$p < 0.0001$
	Complexity judged 'about right'		Intervention 1: 35% Intervention 2: 63% Intervention 3: 98% Intervention 4: 44% Intervention 5: 44%			$p < 0.0001$
	Summed scores for: Judgmental component		Intervention 1: 10.9, $n = 16$ Intervention 2: 9.1, $n = 19$ Intervention 3: 12.2, $n = 19$ Intervention 4: 14.6, $n = 17$ Intervention 5: 13.6, $n = 17$			$p = 0.004$
	Emotional component		Intervention 1: 12.0, $n = 15$ Intervention 2: 9.0, $n = 19$ Intervention 3: 10.9, $n = 17$ Intervention 4: 12.2, $n = 17$ Intervention 5: 12.2, $n = 17$			$p = 0.24$
	Evaluative component One day		Intervention 1: 16.4, $n = 16$ Intervention 2: 19.2, $n = 18$ Intervention 3: 18.9, $n = 20$ Intervention 4: 16.3, $n = 17$ Intervention 5: 17.5, $n = 17$			$p = 0.19$

continued

Trial	How measured	Follow-up	Intervention(s)	Control	Sample size calculation included	Reported statistical significance
Morris <i>et al.</i> , 1980 ⁹⁶	Judgement of WMI: Well written	Not reported	Intervention 1: 16.9 Intervention 2: 16.9 Intervention 3: 16.6 Intervention 4: 16.4		No	$p = \text{NS}$
	Accurate information		Intervention 1: 31.8 Intervention 2: 32.7 Intervention 3: 31.5 Intervention 4: 31.6			$p = \text{NS}$
	Interest value		Intervention 1: 12.7 Intervention 2: 12.3 Intervention 3: 11.2 Intervention 4: 12.9			$p < 0.02$
	Positive evaluation		Intervention 1: 13.8 Intervention 2: 14.5 Intervention 3: 13.1 Intervention 4: 14.4			$p < 0.04$
	Adult readability		Intervention 1: 12.3 Intervention 2: 14.4 Intervention 3: 11.0 Intervention 4: 12.9			$p < 0.001$
Whatley <i>et al.</i> , 2002 ¹⁰⁰	Change in willingness to take trial drug compared to any other drug		Intervention 1: -0.9 95% CI: -0.44 to -1.3		Yes	$p < 0.001$
			Intervention 2: -0.3 95% CI: -0.73 to 0.69			$p = 0.11$
			Intervention 3: -0.4 95% CI: -0.69 to -0.77			$p = 0.1$

continued

Trial	How measured	Follow-up	Intervention(s)	Control	Sample size calculation included	Reported statistical significance
Vander Stichele <i>et al.</i> , 2002 ¹⁰⁴	% agree with the statement that benefits of medicine are greater than the risks:	Same day			No	
	Cisapride		Intervention 1: 62% <i>n</i> = 29 Intervention 2: 31% <i>n</i> = 31	36%, <i>n</i> = 29		<i>p</i> < 0.05 between Intervention 1 and Intervention 2
	Iraconazole		Intervention 1: 64% <i>n</i> = 34 Intervention 2: 41% <i>n</i> = 34	62%, <i>n</i> = 34		<i>p</i> < 0.05 between Intervention 1 and Intervention 2 <i>p</i> < 0.05 between Intervention 1 and C
	Risperidon		Intervention 1: 70% <i>n</i> = 30 Intervention 2: 54% <i>n</i> = 27	84%, <i>n</i> = 26		<i>p</i> < 0.05 between Intervention 1 and Intervention 2 <i>p</i> < 0.05 between Intervention 1 and C
Bergus <i>et al.</i> , 2002 ³⁵	Change in favourability of treatment rating	Unclear	Intervention 1: -5.2 Intervention 2: -10.9		No	<i>p</i> = 0.02
Berry <i>et al.</i> , 2002 ¹⁰⁵	Perceived risk to health	1 day	Intervention 1: 3.8 (1.2), <i>n</i> = 56 Intervention 2: 2.8 (0.9), <i>n</i> = 56		No	<i>p</i> < 0.0001
	Likelihood of compliance		Intervention 1: 3.1 (1.6), <i>n</i> = 56 Intervention 2: 4.2 (1.4), <i>n</i> = 56			<i>p</i> < 0.0001
	Satisfaction with information		Intervention 1: 3.1 (1.3), <i>n</i> = 56 Intervention 2: 3.7 (1.5), <i>n</i> = 56			<i>p</i> < 0.01

continued

Trial	How measured	Follow-up	Intervention(s)	Control	Sample size calculation included	Reported statistical significance
Berry <i>et al.</i> , 2002 ¹⁰⁶	Severity of side-effects	1 day	Intervention 1: 4.5 (0.8), <i>n</i> = 56 Intervention 2: 3.7 (1.3), <i>n</i> = 56	No		<i>p</i> < 0.0002
	Trial one: Satisfaction with the information rating		Trial one: Intervention 1: 2.89 (1.5) Intervention 2: 3.57 (1.4)			Trial one: <i>p</i> < 0.001
	Perceived risk to health		Intervention 1: 3.63 (1.2) Intervention 2: 2.98 (1.1)			<i>p</i> < 0.001
	Intention to comply		Intervention 1: 3.73 (1.6) Intervention 2: 4.49 (1.5)			<i>p</i> < 0.0001
	Ratings of severity of side-effects		Intervention 1: 3.96 (1.3) Intervention 2: 3.64 (1.3)			<i>p</i> < 0.001
	Trial two: Satisfaction with the information rating		Trial two: Intervention 1: 3.00 (1.6) Intervention 2: 2.46 (1.5) Intervention 3: 2.69 (1.6)			Trial two: <i>p</i> < 0.01
	Perceived risk to health		Intervention 1: 3.74 (1.3) Intervention 2: 4.19 (1.2) Intervention 3: 3.87 (1.2)			<i>p</i> < 0.002
	Intention to comply		Intervention 1: 3.78 (1.7) Intervention 2: 2.99 (1.6) Intervention 3: 3.54 (1.7)			<i>p</i> < 0.001
	Trial three: Satisfaction with the information rating		Trial three: Intervention 1: 3.03 (1.6) Intervention 2: 2.78 (1.5) Intervention 3: 2.62 (1.5)			Trial three: <i>p</i> = 0.05
	Perceived risk to health		Intervention 1: 3.66 (1.1) Intervention 2: 3.86 (1.0) Intervention 3: 3.94 (1.0)			<i>p</i> < 0.02

continued

Trial	How measured	Follow-up	Intervention(s)	Control	Sample size calculation included	Reported statistical significance
Berry et al., 2003 ¹⁰⁷	Trial one: Satisfaction with the information	Same day	Trial one: Intervention 1: 2.92 (1.2) Intervention 2: 2.16 (0.9)		No	Trial one: $p < 0.001$
	Perceived risk to health		Intervention 1: 3.74 (0.9) Intervention 2: 4.20 (1.1)			$p < 0.03$
	Intention to comply		Intervention 1: 3.80 (1.2) Intervention 2: 3.38 (1.4)			$p = 0.1$
	Trial two: Satisfaction with the information rating		Trial two: Intervention 1: 4.38 (0.9) Intervention 2: 3.97 (0.9)			Trial two: $p < 0.05$
	Perceived risk to health		Intervention 1: 3.50 (0.8) Intervention 2: 3.93 (0.9)			$p < 0.05$
	Intention to comply		Intervention 1: 4.43 (1.2) Intervention 2: 4.00 (1.1)			$p > 0.05$
	Berry et al., 2003 ¹⁰⁸		Trial one: Self-satisfaction			Same day
Severity of side-effects	Intervention 1: 4.35 (1.3) Intervention 2: 5.22 (1.0)	$p < 0.001$				
Intention to comply	Intervention 1: 3.78 (1.6) Intervention 2: 2.00 (1.3)	$p < 0.001$				
Trial two: Satisfaction	Trial two: Intervention 1: 3.73 (1.3) Intervention 2: 3.71 (1.3) Intervention 3: 3.98 (1.3) Intervention 4: 4.12 (1.2)	Trial two: $p < 0.02$				
Severity of side-effects	Intervention 1: 3.60 (1.0) Intervention 2: 3.22 (1.2) Intervention 3: 3.11 (1.2) Intervention 4: 2.76 (1.1)	$p < 0.001$				

continued

Trial	How measured	Follow-up	Intervention(s)	Control	Sample size calculation included	Reported statistical significance
	Intention to comply		Intervention 1: 4.29 (1.4) Intervention 2: 4.71 (1.3) Intervention 3: 5.07 (1.1) Intervention 4: 5.10 (1.2)			$p < 0.01$
Berry, 2004 ¹⁰⁹	Satisfaction with information	Same day	Intervention 1: 3.51 (1.3) Intervention 2: 3.18 (1.5)		Yes	$p < 0.001$
	Severity of side-effects		Intervention 1: 3.76 (1.2) Intervention 2: 4.25 (1.2)			$p < 0.001$
	Risk to health		Intervention 1: 3.43 (1.3) Intervention 2: 4.00 (1.3)			$p < 0.001$
	Intention to comply		Intervention 1: 3.65 (1.6) Intervention 2: 3.17 (1.5)			$p < 0.001$
Berry et al., 2004 ¹¹⁰	Satisfaction	Same day	Intervention 1: 2.76 (1.3), $n = 94$ Intervention 2: 3.31 (1.3), $n = 94$		No	$p < 0.005$
	Severity of side-effects		Intervention 1: 3.63 (1.1), $n = 94$ Intervention 2: 3.04 (1.1), $n = 94$			$p < 0.001$
	Risk to health		Intervention 1: 3.21 (1.1), $n = 94$ Intervention 2: 2.66 (1.1), $n = 94$			$p < 0.001$
	Intention to take medicine		Intervention 1: 3.06 (1.6), $n = 94$ Intervention 2: 4.14 (1.6), $n = 94$			$p < 0.001$

continued

Trial	How measured	Follow-up	Intervention(s)	Control	Sample size calculation included	Reported statistical significance
Knapp <i>et al.</i> , 2004 ¹¹¹	Pancreatitis: Perceived risk to health		Intervention 1: 3.4, <i>n</i> = 30		Yes	<i>p</i> = 0.002
			Intervention 2: 2.4, <i>n</i> = 30			<i>p</i> = 0.048
	Satisfaction with information		Intervention 1: 3.3, <i>n</i> = 30			<i>p</i> = 0.198
	Intervention 2: 4.1, <i>n</i> = 30		<i>p</i> = 0.163			
	Severity of side-effects		Intervention 1: 3.7, <i>n</i> = 30			<i>p</i> = 0.041
	Intervention 2: 3.3, <i>n</i> = 30		<i>p</i> = 0.059			
	Effect on decision to take medicine		Intervention 1: 3.1, <i>n</i> = 30			<i>p</i> = 0.393
	Intervention 2: 2.5, <i>n</i> = 30		<i>p</i> = 0.037			
	Constipation: Perceived risk to health		Intervention 1: 3.2, <i>n</i> = 30			
	Intervention 2: 2.3, <i>n</i> = 30					
Satisfaction with information	Intervention 1: 3.4, <i>n</i> = 30					
Intervention 2: 4.2, <i>n</i> = 30						
Severity of side-effects	Intervention 1: 3.2, <i>n</i> = 30					
Intervention 2: 2.8, <i>n</i> = 30						
Effect on decision to take medicine	Intervention 1: 3.8, <i>n</i> = 30					
Intervention 2: 2.6, <i>n</i> = 30						

Outcomes in trials measuring behaviour

Trial	How measured	Follow-up	Intervention(s)	Control	Sample size calculation included	Reported statistical significance
Dodds, 1986 ⁶⁷	Median patient behaviour questionnaire re score for assessing actual drug taking	3 months	13/17, <i>n</i> = 31	10/17, <i>n</i> = 30	Yes	<i>p</i> = 0.008
	Median patient compliance score (measured by tablet count and interview)		21/27, <i>n</i> = 31	15/27, <i>n</i> = 30		<i>p</i> = 0.0001
McBean and Blackburn, 1982 ⁸²	Long-term compliance	3 weeks	57.0% <i>n</i> = ?	55.0% <i>n</i> = ?	No	Not reported
Morris and Kanouse, 1982 ⁸³	Mean no. of health problems reported at 2nd follow-up (17 possible side-effects)	3 months	4.1, <i>n</i> = 92	3.6, <i>n</i> = 53	Yes	Not reported
Peveler <i>et al.</i> , 1999 ⁸⁴	Reported continuation of treatment at 6 months (measured by MEMS device recording when tablet container was opened for dosing event)	12 weeks	54 (50.9%), <i>n</i> = 106	54 (50.5%), <i>n</i> = 107	Yes	?
Vander Stichele <i>et al.</i> , 1992 ³⁴	Patient compliance (measured by MEMS device recording when tablet container was opened for dosing event)	8 weeks	19/22 (86.4%)	17/24 (70.8%)	No	
Vesco <i>et al.</i> , 1990 ⁸⁵	End-point theophylline blood levels	8 days	7.6 µg ml ⁻¹ (3.0), <i>n</i> = 18	7.8 µg ml ⁻¹ (3.5), <i>n</i> = 19	No	<i>p</i> = NS
	Stopped taking medicine (measured by pill count)		8/18 (SD)	3/19 (SD)		<i>p</i> = NS
	Side-effects reported (symptom score per treatment day)		0.7 (SD), <i>n</i> = ?	0.3 (SD), <i>n</i> = ?		<i>p</i> < 0.05
Baker <i>et al.</i> , 1991 ⁸⁸	Reduced worry about drug treatment as a result of specific information	2 weeks	26/49 (53.1%)	13/52 (25.0%)	No	<i>p</i> < 0.05
Quaid <i>et al.</i> , 1990 ⁹⁸	Mean no. of side-effects reported to experimenter	6 weeks	2.00 (1.9) <i>n</i> = 14	2.00 (2.3) <i>n</i> = 14	No	<i>p</i> = NS
	Mean no. of side-effects reported to physician		1.14 (1.2) <i>n</i> = 14	1.43 (1.8) <i>n</i> = 14		<i>p</i> = NS
Van Haecht <i>et al.</i> , 1991 ⁹⁹	Read the PIL thoroughly	Unclear	51/161 (31.7%)	38/156 (24.3%)	No	

Appendix 7

Mapping patient-centred processes on to the effectiveness trials

Role and value and workshops: Patient uses and values of WMI	WMI vs nothing (10 trials)	WMI + oral vs oral (8 trials)	WMI vs WMI (6 trials)	WMI vs various (6 trials reported in 4 papers)	WMI risk descriptors vs risk descriptor (13 trials reported in 8 papers)
Did WMI help patients learn how to manage their treatment?	Not measured	• Baker, 1991 ⁸⁸	Not measured	• Clark and Bayley, 1972 ¹⁰¹	Not measured
Did WMI help patients to decide whether or not to take medicine?	Not measured	Not measured	Not measured	Not measured	• Knapp et al., 2004 ¹¹¹
Did WMI help understanding of rationale for medicine choice?	Not measured	Not measured	Not measured	Not measured	Not measured
Did WMI help patients check if appropriate/right medicine prescribed?	• Gibbs et al., 1989 ⁷⁹	• Baker et al., 1991 ⁸⁸	Not measured	Not measured	Not measured
Did WMI reinforce verbal information from prescriber?	No	Yes – similar spoken and written information • Arthur and Clifford, 1998 ⁸⁷ • Baker et al., 1991 ⁸⁸ • Peura et al., 1993 ⁸⁹ • Regner et al., 1987 ⁹² • Savas and Evcik, 2001 ⁹¹ • Young and Brooks, 1986 ⁹⁴	No	No	No
Did prescriber explain/endorse WMI?	No	No dissimilar spoken and written information • Pope et al., 1998 ⁹⁰ • Strydom and Hall, 2001 ⁹³	No	No	No
Did WMI detail adverse effects?	WMI provided at least minimal information about adverse effects • Dodds, 1986 ⁶⁷ • Gibbs et al., 1989 ⁷⁹ • Johnson et al., 1986 ⁸⁰ • Morris and Kanouse, 1982 ⁸³ • Peveler et al. 1999 ⁸⁴ • Vander Stichele et al., 1992 ³⁴	WMI provided at least minimal information about adverse effects • Arthur and Clifford, 1998 ⁸⁷ • Baker et al., 1991 ⁸⁸ • Peura et al., 1993 ⁸⁹ • Pope et al., 1998 ⁹⁰ • Regner et al., 1987 ⁹² • Savas and Evcik, 2001 ⁹¹ • Young and Brooks, 1986 ⁹⁴	WMI provided at least minimal information about adverse effects • Labor et al., 1995 ⁹⁵ • Morris et al., 1980 ⁹⁶ • Morris and Kanouse, 1981 ⁹⁷ • Quaid et al., 1990 ⁹⁸ • Van Haecht et al., 1991 ⁹⁹ • Whatley et al., 2002 ¹⁰⁰	WMI provided at least minimal information about adverse effects • Dolinsky et al., 1983 ¹⁰² • Vander Stichele et al., 2002 ¹⁰⁴	WMI provided at least minimal information about adverse effects • Bergus et al., 2002 ³⁵ • Berry et al., 2002 ¹⁰⁶ • Berry et al., 2002 ¹⁰⁹ • Berry et al., 2003 ¹⁰⁷ • Berry et al., 2003 ¹⁰⁸ • Berry et al., 2004 ¹⁰⁹ • Berry, 2004 ¹¹⁰ • Knapp et al., 2004 ¹¹¹

continued

Role and value and workshops: Patient uses and values of WMI	WMI vs nothing (10 trials)	WMI + oral vs oral (8 trials)	WMI vs WMI (6 trials)	WMI vs various (6 trials reported in 4 papers)	WMI risk descriptors vs risk descriptor (13 trials reported in 8 papers)
	<ul style="list-style-type: none"> • Vesco et al., 1990⁸⁵ • Weiderholt and Kotzan, 1983⁸⁶ 				
Was WMI condition specific?	<ul style="list-style-type: none"> • Peveler et al., 1999⁸⁴ 	No	No	No	No
Were patients with experience of medicine involved in developing WMI?	No	No	No	No	No
Were research participants taking the medicine of the WMI being studied?	<ul style="list-style-type: none"> • Dodds 1986⁶⁷ • Gibbs et al., 1989⁷⁹ • Johnson et al., 1986⁸⁰ • Kumana et al., 1988⁸¹ • McBean and Blackburn, 1982⁸² • Morris and Kanouse, 1982⁸³ • Peveler et al., 1999⁸⁴ • Vander Stichele et al., 1997³⁴ • Vesco et al., 1990⁸⁵ • Weiderholt and Kotzan, 1983⁸⁶ 	<ul style="list-style-type: none"> • Arthur and Clifford, 1998⁸⁷ • Baker et al., 1991⁸⁸ • Peura et al., 1993⁸⁹ • Pope et al., 1998⁹⁰ • Regner et al., 1987⁹² • Savas and Evcik, 2001⁹¹ • Strydom and Hall, 2001⁹³ • Young and Brooks, 1986⁹⁴ 	<ul style="list-style-type: none"> • Quaid et al., 1990⁹⁸ • Van Haecht et al., 1991⁹⁹ • Little et al., 1998¹⁰³ 	<ul style="list-style-type: none"> • Clark and Bayley, 1972¹⁰¹ • Dolinsky et al., 1983¹⁰² 	

Appendix 8

Full list of texts cited by key informants

Selected texts are listed in bold type.

David Dickinson

- **Sless D, Wiseman R. *Writing about medicines for people*. 2nd ed. Melbourne: Communication Research Institute of Australia; 2004.**
- **Plain English Campaign. *The plain English guide to writing medical information*. URL: <http://www.plainenglish.co.uk/medicalguide.html> (accessed 28 November 2005)**
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Brian Parkinson

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Karel van de Waarde

- Sless D. *Usable medicines information*. Canberra: CRIA; 2001.
- Van der Stichele R. *Impact of written drug information in patient package inserts. Acceptance and benefit/risk perception*. PhD thesis. Ghent: Academia Press; 2004.
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Prof. Pat. Wright

- Hartley J. *Designing instructional text*. 3rd ed. London: Kogan Page; 1994.
- **Shriver KA. *Seeing the text: the role of typography and space*. In Schriver KA, editor. *Dynamics in document design: creating text for readers*. Chichester: John Wiley; 1997.**
- **Wright P. *Designing healthcare advice for the public*. In Durso FT, editor. *Handbook of applied cognition*. Chichester, John Wiley; 1999.**

Appendix 9

Copies of interventions

The following papers reported trials in the effectiveness review, either published copies (or extracts) of the WMI intervention which were reproducible, or provided a copy on written request.

- Arthur V, Clifford C. Evaluation of information given to rheumatology patients using non-steroid anti-inflammatory drugs. *J Clin Nurs* 1998;**7**:175–81.
- Baker D, Roberts DE, Newcombe RG, Fox KA. Evaluation of drug information for cardiology patients. *Br J Clin Pharmacol* 1991;**31**:525–31.
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- Morris LA, Kanouse DE. Consumer Reactions to the Tone of Written Drug Information. *Am J Hosp Pharm* 1981;**38**:667–71.
- Peura S, Klaukka T, Hannula AM, Eerikainen S. Electronically produced information leaflets increase patients' understanding of antibiotics. *Int J Pharm Pract* 1993;**2**:22–5.
- Peveler R, George C, Kinmonth AL, Campbell M, Thompson C. Effect of antidepressant drug counselling and information leaflets on adherence to drug treatment in primary care: randomised controlled trial. *BMJ* 1999;**319**:612–5.
- Pope JE, Stevens A, Rooks M. A randomized double blind trial of verbal NSAID education compared to verbal and written education. *J Rheumatol* 1998;**25**:771–5.
- Quaid KA, Faden RR, Vining EP, Freeman JM. Informed consent for a prescription drug: impact of disclosed information on patient understanding and medical outcomes. *Patient Educ Couns* 1990;**15**:249–59.
- Savas S, Evcik D. Do undereducated patients read and understand written education materials? A pilot study in Isparta, Turkey. *Scand J Rheumatol* 2001;**30**:99–102.

- Vander Stichele RH, Thomson M, Verkoelen K, Droussin AM. Measuring patient compliance with electronic monitoring: lisinopril versus atenolol in essential hypertension. *Post Market Surveill* 1992;**6**:79–90.
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NON STEROIDAL ANTI-INFLAMMATORY DRUGS (NSAIDS)

A leaflet for patients with inflammatory joint disease

What is inflammatory joint disease?

Inflammatory joint disease means that there is inflammation in your joints. This can make them painful, tender, hot, swollen and stiff. Many patients with rheumatic diseases like:

rheumatoid arthritis	polyarthritis
reactive arthritis	osteoarthritis

suffer from inflammation in their joints. When you have inflammatory joint disease your joints may not be painful, stiff and swollen all of the time. This leaflet is to help you to understand when you should take your tablets and why.

What are non steroidal anti-inflammatory drugs?

Non steroidal anti-inflammatory drugs are also called NSAIDS or anti-inflammatories. They are used to reduce the activity of your disease and the pain and stiffness in your joints. They do not have any steroids in them. There are many NSAIDS. Some suit some people better than others. All medicines have two names. The name in brackets is the company name. Some common ones which you may have used or heard of are:

Ibuprofen (Brufen) (Fenbid)	Indomethacin (Indocid)
Naproxen (Naprosyn)	Nabumetone (Relifex)
Diclofenac (Voltarol) (Voltarol Retard)	

NSAIDS come in many forms. Your doctor may prescribe them to take by mouth as:

tablets	dispersible tablets	
granules	capsules	liquid

They may also be prescribed as a suppository which is inserted into the back passage. There are also creams which contain NSAIDS and they can be rubbed onto the affected joint.

How do NSAIDS work?

These medications work by relieving the inflammation that causes the pain, swelling and stiffness in your joints. They usually work quite quickly and your joints should feel better within a few days.

How often should I take NSAIDS?

You should take them as stated on the container or as directed by the doctor. The effect of some will last all day and others for only a few hours. You must take them with or after food, or with a glass of milk. Take them regularly to get pain relief but do not take more than the stated dose.

Do I have to take NSAIDS all the time?

If your arthritis is better you can reduce the dose. Some people who are taking second line drugs such as gold, penicillamine or sulphasalazine find that they can stop their NSAIDS altogether. This is when their disease is controlled. You need to discuss this with your doctor.

Are there any side effects?

Yes, any medicines can cause side effects. Some people may get:

tummy upsets	nausea
indigestion	heartburn
	diarrhoea

You must take your NSAIDS with or after food otherwise you may suffer from these side effects. Sometimes NSAIDS can cause or aggravate a stomach or duodenal ulcer. You MUST tell your doctor if you have ever had an ulcer.

Other people have reported:

dizziness	skin rash	tightness in the chest
-----------	-----------	------------------------

You must tell your G.P. if you get any of these side effects. You may be told to stop taking the NSAIDS.

IMPORTANT

If you are pregnant or breast feeding tell your doctor. It is best not take any medication unless you have consulted your doctor.

SAFETY

ALWAYS keep all medicines out of the reach of children.

PREPARED BY THE DEPARTMENTS OF RHEUMATOLOGY
AND PHARMACY, SELLY OAK HOSPITAL, BIRMINGHAM.

What should I do if I miss a dose?

Carry on as if you had taken the dose. NEVER double the dose

Should I take other medicines or tablets whilst taking NSAIDS?

You should check with your G.P. or pharmacist.

For instance:

You should not take ASPIRIN or anything which contains aspirin with NSAIDS unless your doctor has prescribed it. Aspirin and NSAIDS together can alter the action of WARFARIN (a blood thinning tablet). Do not take any other pain killing medicines such as Ibuprofen, Nurofen, or Prolflex if you are taking NSAIDS.

You may take Paracetamol (Panadol) quite safely as prescribed. If you are in a lot of pain your doctor may prescribe other analgesics.

Remind your doctor if you suffer from ASTHMA and have not had NSAIDS before.

Can I take alcohol with NSAIDS?

Alcohol can make the indigestion which sometimes occurs with NSAIDS worse.

Arthur V, Clifford C. Evaluation of information given to rheumatology patients using non-steroid anti-inflammatory drugs. *J Clin Nurs* 1988;7:175-81. Not previously published. Reprinted with permission.

Information about your drug treatment

- This booklet tells you more about your drugs.
- The names used for your drugs in this booklet are their 'proper names'. These are the same as on the medicine bottles that the hospital has given you. Your GP or chemist may give you the same tablets known by different names — the 'brand name'. Your GP may also use a tablet which combines several of your drugs.
- Make sure your doctor is aware of all the medicines you take before any new drug is started.
- Take each drug as directed on the bottle. If you forget a dose, take it as soon as you remember. If a drug causes unpleasant or unwanted effects, do not stop taking it without contacting your doctor.
- You may drive as usual or drink moderate amounts of alcohol unless the information about a particular drug tells you not to.
- You may need specific advice during pregnancy. Please ask.
- Destroy any drugs you no longer need by flushing them down the toilet.
- If you need any more information, please ask.

© Departments of Cardiology and Pharmacy,
The University Hospital of Wales, Cardiff.

Glyceryl trinitrate sublingual tablets ('GTN')

What they do

GTN is used to treat an attack of angina and it works very quickly when placed under the tongue. GTN relaxes the coronary arteries that supply blood to the heart. The tablets reduce the work of the heart and relieve angina.

Precautions

If an attack of angina continues for 20 minutes or more and is not relieved by GTN and resting, you should seek medical attention *immediately*.

You may get a throbbing headache, nausea and/or dizziness when you first start taking these tablets. These side effects normally wear off after a few weeks.

Other information

Once the angina pain has eased you may remove the tablet from your mouth and throw it away. This may reduce the chance of headaches. The tablet dissolves more easily if you moisten it in your mouth.

You must renew the tablets after 8 weeks once the bottle has been opened because the tablets gradually lose their effects.

It is useful to place a tablet under your tongue before doing anything that you know brings on an attack of angina.

The benefits of taking the tablets continue even in patients who need GTN every day.

You may take GTN for each attack of angina, even if you have several attacks in one day.

Beta-blocker

The proper name of your drug is

What it does

This drug reduces the work of the heart. It may be used to treat angina, control the heart rhythm or reduce high blood pressure — depending on the dose.

Precautions

It is a very safe drug. Rarely it causes cold hands or feet, stomach upsets or sleeping problems. This drug has to be used with caution by people with asthma or respiratory problems.

While taking this drug, a few men have difficulties with sexual intercourse because they cannot get an erection. This problem does go away if you stop taking the drug, but only do so after contacting your doctor.

Other information

This drug can be taken with or without food.

Warfarin

What it does

Warfarin makes your blood less likely to clot. This is particularly important for people with artificial or damaged heart valves and in certain other conditions where the risks of clotting are increased.

Precautions

The dose of this drug must be adjusted to the needs of your body and these needs can change. For this reason your blood needs to be tested regularly.

If you experience bruising or nosebleeds do not stop taking warfarin but be sure to tell your doctor.

Cuts take longer to stop bleeding in patients taking warfarin.

Do not take tablets containing aspirin while taking warfarin. Certain other tablets, especially those used to treat arthritis, can affect the dose you need. Do not take any new tablets without checking if it is safe to do so while taking warfarin.

Other information

Try to avoid drinking alcohol, *especially in large amounts*, as it may seriously upset the effect of this drug.

You may take warfarin with or without food.

Digoxin

What it does

Digoxin strengthens the heart's pumping action, so it is used to treat a weak heart. It is also used to control certain fast or irregular heartbeats.

Precautions

Most people taking this drug feel very well but loss of appetite, nausea, vomiting or blurred vision may occur if the dose of digoxin is too high for you. If you get any of these problems, do not stop taking these tablets but do tell your doctor so he can change your dose.

Other information

You may take digoxin with or without food.

Originally published in Baker D, Roberts DE, Newcombe RG, Fox KA. Evaluation of drug information for cardiology patients. *Br J Clin Pharmacol* 1991;31:525-31. Reprinted with permission.

Aspirin Therapy

The carotid arteries, which lie on either side of the neck, are the two major arteries that supply blood to the brain. When blood is prevented from traveling to the brain, a medical emergency called a stroke can occur.

Imagine that your doctor has told you that you have a mild (40%) narrowing in your left carotid artery. You recently had a brief episode (about 20 minutes) of numbness in your face and right arm. You went to see your doctor the next day. Although your symptoms had completely resolved your doctor was very concerned. He was worried that you had experienced a temporary blockage of the blood supply to your brain (a transient ischemic episode or TIA). He recommended that you get an imaging study of your carotid arteries. This study found the mild narrowing on the left and a normal carotid artery on the right.

A narrowing of a carotid artery reduces the blood flow to your brain. This can lead to a stroke when a blood clot or some plaque further blocks the passage of blood to the brain for more than a few minutes. A stroke causes a permanent injury to your brain.

Aspirin is widely used as an intervention to reduce the risk of stroke when people have a mild degree of narrowing in a carotid artery. This therapy would involve taking a regular aspirin (325 mg) each and every day for the rest of your life.

Question 1: On the scale below please mark how favorable you are towards using aspirin therapy for the next five years?

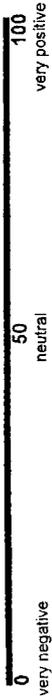


Risks and Benefits of Aspirin Therapy

Taking aspirin therapy is not risk-free. Studies have shown that people who regularly take aspirin are more likely to develop gastrointestinal side effects including stomach pain, heart burn, and nausea at a rate 40% higher than in people not taking aspirin. Aspirin takers also have a two-fold increase in risk of ulcers but it is still less than one in one thousand users each year. At some point, nearly a third of regular aspirin users notice bleeding problems but most are minor and involve easy bruising or nose bleeds. However, aspirin users are also more prone to the uncommon complication of bleeding within the brain. This complication is still very uncommon in aspirin users (1 in 3,000 per year), but it is twice the rate found in people who do not use aspirin.

Aspirin therapy has been shown to be an effective way to may reduce your stroke risk by about 25%. If you decide not use aspirin therapy your risk of having a stroke is about 2% over the next three years. In addition, research has shown that aspirin therapy will also reduce your risk of heart attacks by about the same 25%.

Question 2: On the scale below please mark how favorable you are towards using aspirin therapy for the next five years?



Benefits and Risks of Aspirin Therapy

Aspirin therapy has been shown to be an effective way to may reduce your stroke risk by about 25%. If you decide not use aspirin therapy your risk of having a stroke is about 2% over the next three years. In addition, research has shown that aspirin therapy will also reduce your risk of heart attacks by about the same 25%.

Taking aspirin therapy is not risk-free. Studies have shown that people who regularly take aspirin are more likely to develop gastrointestinal side effects including stomach pain, heart burn, and nausea at a rate 40% higher than in people not taking aspirin. Aspirin takers also have a two-fold increase in risk of ulcers but it is still less than one in one thousand users each year. At some point, nearly a third of regular aspirin users notice bleeding problems but most are minor and involve easy bruising or nose bleeds. However, aspirin users are also more prone to the uncommon complication of bleeding within the brain. This complication is still very uncommon in aspirin users (1 in 3,000 per year), but it is twice the rate found in people who do not use aspirin.

Question 2: On the scale below please mark how favorable you are towards using aspirin therapy for the next five years?



Bergus GR, Levin IP, Elstein AS. Presenting risks and benefits to patients: the effect of information giving on decision making. *J Gen Intern Med* 2002;17:612-17. Not previously published. Reprinted with permission.

Example of scenario (showing mild side effects)

You have gone to your doctor with a very sore throat and a raised temperature. It is particularly painful when you try to swallow. The doctor examines your throat, makes a firm diagnosis of throat infection, and prescribes a medication called Epidoxin. The medicine comes with an information leaflet, which includes the following paragraph about the drug's side effects.

“Epidoxin is associated with some side effects. It can cause a furred tongue and increased thirst. There is also a risk of indigestion and tiredness.”

Originally published in Berry D, Knapp P, Raynor T. Is 15 per cent very common? Informing people about the risks of medication side effects. *Int J Pharm Pract* 2002;**10**:145–51. Reprinted with permission.

Example of a scenario describing one of the severe diseases

“You have gone to your doctor with a very bad cough and a high temperature. The cough is accompanied by a severe pain in your chest. You are sent to the hospital for some tests. The doctor then makes a firm diagnosis of pneumonia and prescribes a medication called Epidoxin. The medication comes with an information leaflet, which includes the following paragraph about the drug's side effects.”

Example of one of the paragraphs describing many mild side effects

“Epidoxin is associated with some side effects. It can cause a furred tongue and increased thirst. There is also a risk of indigestion and tiredness. Epidoxin can also cause a rash and a headache”.

Example of one of the paragraphs describing many severe side effects

“Epidoxin is associated with some side effects. It can cause convulsions and chest pain. There is also a risk of loss of co-ordination and blurred vision. Epidoxin can also cause stomach pains and anaemia.”

Originally published in Berry DC, Michas IC, Bersellini E. Communicating information about medication side effects: effects on satisfaction, perceived risk to health, and intention to comply. *Psychol Health* 2002;**17**:247–67. Reprinted with permission from Taylor & Francis Ltd, <http://www.tandf.co.uk/journals>.

Example of a Scenario used in Experiment 1

“You have gone to your doctor with a very bad cough and a high temperature. The cough is accompanied by a severe pain in your chest. You are sent to the hospital for some tests. The doctor then makes a firm diagnosis of pneumonia and prescribes a medication called Epidoxin. The medication comes with an information leaflet, which includes the following paragraph about the drug’s side effects.”

Example of One of the ‘Personalised’ Explanations Used in Experiment 1

“Epidoxin is associated with some side effects. If you take this medicine, there is a substantial chance of you getting one or more of its side effects. You may get convulsions and chest pain. There is also a risk of you getting loss of co-ordination and blurred vision. You may also experience stomach pains and anaemia.”

Example of one of the “Non-personalised” Explanations Used in Experiment 1

“Epidoxin is associated with some side effects. A substantial proportion of people who take this medication get one or more of its side effects. Epidoxin can cause convulsions and chest pain. There is also a risk of loss of co-ordination and blurred vision. It can also cause stomach pains and anaemia.”

Scenario Used for Experiment 2

“You have gone to the doctor with a severe sore throat, progressive tenderness in the neck and a low grade temperature. Your doctor makes a firm diagnosis and prescribes some medication. You are given the following explanation.”

Personalised Explanation

“Your symptoms suggest that you are suffering from subacute thyroiditis. This is an acute inflammatory disease of your thyroid gland. This is a common condition and has probably resulted from your having contracted a viral infection.

To solve the problem, there is one drug that I would like you to take.

The drug you have been prescribed is marketed under the name Solupred. It is a corticosteroid, which should reduce your inflammation. In the majority of cases it will effectively treat people suffering from your condition and your symptoms should disappear after two or three days.

Originally published in Berry DC, Michas IC, Bersellini E. Communicating information about medication: the benefits of making it personal. *Psychol Health* 2003;18:127–39. Reprinted with permission from Taylor & Francis Ltd, <http://www.tandf.co.uk/journals>.

Example of scenario used in Experiments 1 and 2 (showing a set of severe effects)

You have gone to your doctor with a very sore throat and a raised temperature. It is particularly painful when you try to swallow. The doctor examines your throat, makes a firm diagnosis of a throat infection, and prescribes a medication called Epidoxin. The medicine comes with an information leaflet, which includes the following paragraph about the drug’s side effects: ‘Epidoxin is associated with some side effects. It can cause a chest pain and convulsions. There is also a risk of loss of co-ordination and blurred vision’.

Originally published in Berry DC, Raynor DK, Knapp P. Communicating risk of medication side effects: An empirical evaluation of EU recommended terminology. *Psychol Health Med* 2003;8:251–63. Reprinted with permission from Taylor & Francis Ltd, <http://www.tandf.co.uk/journals>.

Appendix

Example of one of the scenarios used. (The wording of the 'ear infection' and the 'adult' versions were very similar but the latter referred to the reader themselves rather than their child.)

'You have taken your 1-year-old child to the doctor with what seems to be a very sore throat and raised temperature. It is particularly painful when he/she tries to swallow. The doctor examines your child's throat, makes a firm diagnosis of a throat infection, and prescribes a medication called Epidoxin, which is a short course antibiotic used to treat throat/ear infections. The medicine comes with an information leaflet, which includes the following paragraph about the drug's side effects.

Epidoxin is associated with some side effects. It can cause increased thirst and a loss of appetite. There is also a risk of indigestion and tiredness.'

Originally published in Berry DC. Interpreting information about medication side effects: differences in risk perception and intention to comply when medicines are prescribed for adults or young children. *Psychol Health Med* 2004;9:227-34. Reprinted with permission from Taylor & Francis Ltd, <http://www.tandf.co.uk/journals>.

Typical Programmed Instruction Frame

19.

Warfarin should be taken at the same time each day so that you get into the "Warfarin habit." Your physician may suggest a time, such as lunchtime or bedtime. By taking Warfarin at a specific time, you will maintain a constant level of the medicine in your body, and you will be less likely to forget to take it.

Fill in the blank:

For most effective results, take your Warfarin at _____ each day.

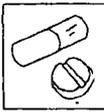
Flip over

The best answer is at "the same time" each day. If you said "at breakfast," or "at bedtime," or "at dinner," you may be correct, but you should ask your physician at what time he recommends that you take your Warfarin.

Go to Frame 20

Originally published in Clark CM, Bayley EW. Evaluation of the use of programmed instruction for patients maintained on Warfarin therapy. *Am J Public Health* 1972;62:1135-9. Reprinted with permission.

WHAT IS THIS DRUG FOR?

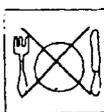


It is an antibiotic which means it kills germs in the body which cause infections.

WHEN SHOULD I TAKE IT?



This drug should be taken regularly FOUR times each day. If possible take a dose every six hours. If this is difficult, space out the four doses evenly during the time you are awake. Please read the label on the bottle to find out what dose (that is, how many tablets) you must take at each of these times.



This drug works best if it is taken on an empty stomach, so take it with a glass of water about an hour before you eat or two hours after you eat. Do not take this drug with a glass of milk, a milky drink, cheese or other dairy products, as this will stop the drug from getting into your blood. Do not eat any of these foods for at least an hour before and after taking your tablets.

WHAT IF I FORGET A DOSE?

Take it as soon as you remember, then continue as before. If you forget to take it before you eat, it is better to take it with your meal than to miss it out.

HOW LONG MUST I TAKE IT FOR?



It is very important that you keep taking the medicine until the bottle is empty. You may feel better in a few days but if you stop the drug too soon, the germs can return and make you ill again.

CAN IT CAUSE ANY SIDE EFFECTS?



Most people will get no side effects from this drug but nearly all drugs can cause side effects as well as do you good. If you come out in a skin rash, or start itching badly, or feel short of breath, ring your own doctor or the hospital straight away and ask for advice on what to do.

Some people feel sick or have a mild stomach upset when taking this drug. This can usually be stopped by taking the drug with a small amount of food, eg biscuits but do not take it with milk.



This drug can make your skin burn easily in the sun. If you are sunbathing, be careful and cover yourself if you start to burn. If you get badly sunburnt, see your doctor.

WHAT ELSE SHOULD I KNOW?

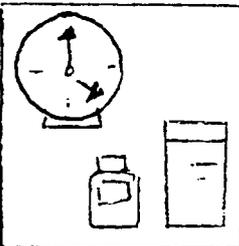
This drug interferes with the action of some other drugs. If you get heartburn or indigestion and take an antacid (eg Rennie's or Milk of Magnesia) or are taking iron tablets or vitamins, make sure you wait at least two hours between taking a dose of tetracycline and a dose of these other drugs. If you are a woman taking the oral contraceptive "pill" there is a slight chance that this drug can stop your pill working. This means that you can become pregnant. The safest thing to do is to use an extra contraceptive, eg the sheath (condom), as well as the "pill" all the time you are taking this drug and until you start a new pack of the "pill".

If you are pregnant or think that you might be pregnant, tell your doctor or pharmacist before you take any of this drug. The doctor may want to give you a different antibiotic.

REMEMBER: TAKE THIS DRUG REGULARLY UNTIL THE BOTTLE IS EMPTY. UNLESS YOU ARE TOLD DIFFERENTLY BY YOUR DOCTOR.

Part of the tetracycline patient leaflet

WHEN SHOULD I TAKE IT?



This drug should be taken regularly FOUR times each day. If possible take a dose every six hours. If this is difficult, space out the four doses evenly during the time you are awake. Please read the label on the bottle to find out what dose (that is, how many tablets) you must take at each of these times.

Originally published in Dodds LJ. Effects of information leaflets on compliance with antibiotic therapy. *Pharma J* 1986;236:48-51. Reprinted with permission.

Example of a medication information sheet for ampicillin in the ROA format.

The directions on your prescription label were developed specifically for you. Follow these directions exactly!

- Swallow each capsule with water
- Take on an empty stomach (one hour before or two hours after a meal)
- Take ALL of your medicine

It may seem that your infection has cleared up before you finish taking all your medicine. This might only mean that the infection has been weakened. It still may be in your body. This is why you must finish taking all of the medicine in your prescription according to the directions.

Example of a medication information sheet for ampicillin in the R format.

The directions on your prescription label were developed specifically for you. Follow these directions exactly! Swallow each capsule with water. Take on an empty stomach (one hour before or two hours after a meal). Take all of your medicine.

It may seem that your infection has cleared up before you finish taking all your medicine. This might only mean that the infection has been weakened. It still may be in your body. This is why you must finish taking all of the medicine in your prescription according to the directions.

Originally published in Dolinsky D, Gross SM, Deutsch T, Demestihis E, Dolinsky R. Application of psychological principles to the design of written patient information. *Am J Hospital Pharmacy* 1983;**40**:266-71. © 1983, American Society of Health-System Pharmacists, Inc. All rights reserved.

What you should know about Beta Blockers.

Please read this carefully before you start to take your medicine. If you have any questions or are not sure about anything ask your doctor or pharmacist.

The name of your medicine is _____

This is one of a group of medicines called Beta Blockers. Beta Blockers can help you in a number of ways:

- They can reduce high blood pressure.
- They can lessen or prevent chest pain (angina).
- They can control heart beats which are irregular or too fast.
- Some medicines of this type are used to calm people who are anxious or worried.

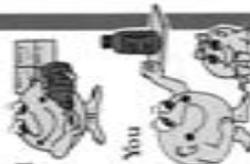
Things to remember about Beta Blockers

1 Make sure it is safe for you to take Beta Blockers
(see the back of this leaflet). ♦



2 Look at the label on your Beta Blockers. It will tell you when to take them.

3 Keep taking your Beta Blockers until they are finished or your doctor says otherwise. **Don't stop** just because you feel better.



4 Beta Blockers can cause problems. You can find these listed on the back of this leaflet. *

5 Keep your Beta Blockers out of reach of children.

6 Remember to return any unused Beta Blockers to your pharmacist or flush them down the toilet unless your doctor has told you to keep them.

You will find more about Beta Blockers on the back of this leaflet.

Your medicine is one in a group of medicines called Beta Blockers. Beta Blockers can help you by reducing high blood pressure, by lessening or preventing chest pain (angina) or by controlling heart beats which are irregular or too fast. Some medicines of this type are used to calm people who are anxious or worried.

◆ Before taking your medicine

- Do you suffer from asthma or attacks of wheezing?
- Are you diabetic and taking insulin or tablets?
- Are you pregnant?

If the answer is YES to any of these questions tell your doctor or pharmacist.

◆ Taking your medicine

- It is important to take your medicine at the right times. The label will tell you how much to take and how often. If it doesn't or you are not sure, ask your doctor or pharmacist.
- Take the tablets or capsules with a glass of water.
- Keep taking your medicine until your doctor tells you to stop. Don't stop just because you feel better. If you stop too soon your condition may get worse.
- If you forget to take a dose take another as soon as you remember. Then go on as before.
- If you take an overdose by accident contact your nearest hospital casualty department or tell your doctor immediately.

* After taking your medicine

Although most people benefit from taking this medicine, a few people can be upset by it. If you get any of the following tell your doctor.

- Dizziness or lightheadedness or wheezing.
 - A very slow pulse (under 50 beats per minute)
 - Skin trouble such as rash or itching for the first time.
- Very occasionally, this type of medicine can cause sleeplessness or vivid dreams. Don't be worried because they are not serious. But tell your doctor when you go next time.

If you are taking this medicine for chest pains don't stop it suddenly, otherwise the pain will get much worse. Your doctor will tell you how to reduce the dose slowly. This will take about two weeks.

◆ Storing your medicine

- Keep your medicine in a safe place where children cannot reach it. Your medicine could harm them.
- If your doctor decides to stop the treatment, return any left over medicine to the pharmacist or flush it down the toilet. Only keep it if your doctor tells you to.

REMEMBER: This medicine is for YOU. Only a doctor can prescribe it for you. Never give it to someone else. It may harm them even if their symptoms are the same as yours.

You can find more information about prescribed medicines in a book by Professor Peter Poole called "Medicine: A Guide for Everybody". (Penguin Books).

Originally published in Gibbs S, Waters WE, George CF. The benefits of prescription information leaflets (1). *Br J Clin Pharmacol* 1989;27:723-39. Reprinted with permission.

“Atorvastatin is associated with some side effects. It can cause pancreatitis. This is a rare side effect of the medicine.” (Verbal condition only)
“Atorvastatin is associated with some side effects. It can cause pancreatitis. This side effect occurs in 0.04% (that is, 4 in 10 000) people who take this medicine.” (Numerical condition only)

Originally published in Knapp P, Raynor DK, Berry DC. Comparison of two methods of presenting risk information to patients about the side effects of medicines. *Quality and Safety in Health Care* 2004;**13**:176–80. Reprinted with permission.

Examples of the three levels of depth for information leaflets used in this study

Simple Version

Purpose of the Drug:

Seldane[®] is used to stop a runny nose and runny eyes.

Patient Norm Version

Purpose of the Drug:

Seldane[®] is used to relieve or prevent the symptoms of hay fever and other types of allergies. Seldane[®] also may be used for other conditions as determined by your doctor. It works by preventing the effects of a substance called histamine, which is produced by the body.

Professional Version

Purpose of the Drug:

Terfenadine[®] is indicated for the relief of symptoms associated with seasonal allergic rhinitis such as sneezing, rhinorrhea, pruritus, and lacrimation. Clinical studies conducted to date have not demonstrated effectiveness of Terfenadine[®] in the common cold. Seldane[®] has been used as a treatment adjunct to asthma.

Originally published in Labor SL, Schommer JC, Pathak DS. Information overload with written prescription drug information. *Drug Inf J* 1995;**29**:1317–28. Reprinted with permission.

Twelve basic pill rules

- Factors associated with pill failure
 - severe diarrhea
 - Vomiting
 - Missing pill by 12 hours
 - Starting packet late
 - Antibiotics

- Subsequent action after pill failure
 - Continue taking the pill
 - Extra precautions (barrier methods)
 - Use extra precautions during pill failure and for 7 more days (7 day rule)
 - Run the packets together if missed pill during the past week
 - Emergency contraception if had sex in pill free week and starts packet late

- Emergency contraception
 - Emergency pill
 - 72 hour time limit

Originally published in Little P, Griffin S, Kelly J, Dickson N, Sadler C. Effect of educational leaflets and questions on knowledge of contraception in women taking the combined contraceptive pill: randomised controlled trial. *BMJ* 1998;**316**:1948–52. Reprinted with permission.

Pharmacy: University Pharmacy

Patient: Adam Smith

ERYMYCIN ENTEROTABLET - FOR ADULTS

The drug prescribed is an antibiotic belonging to the erythromycin group. It is used for the treatment of bacterial infections.

The drug is most effective when it is present at sufficient concentration in the body. Follow the dosage instructions as carefully as possible, taking the drug at regular intervals. The timing of medication should be adjusted to your daily routine and sleep pattern.

Finish the course even if symptoms disappear within a few days of starting the medication, otherwise surviving bacteria may become resistant to the drug and the disease may recur.

If you forget one or more doses, take a dose as soon as you remember and then revert to normal schedule.

The drug is most effective when it is taken just **before meals**.

Mild side effects such as stomach irritation, loose stools and nausea may occur but do not usually necessitate discontinuation of the drug. If you experience rash, diarrhoea associated with fever or other troublesome symptoms or sensations, contact your doctor immediately.

This product is manufactured in such a way that it passes through stomach without disintegrating and is absorbed only in the intestine. To preserve its structure, the product must be **swallowed whole**. In other words, it must not be halved, crushed or chewed. If this causes problems, consult your doctor.

Small amounts of alcohol will not adversely affect treatment. You may drink a glass of wine or beer if you wish. You may bathe in the sauna if your general condition allows.

Originally published in Peura S, Klaukka T, Hannula AM, Eerikainen S. Electronically produced information leaflets increase patients' understanding of antibiotics. *Int J Pharm Pract* 1993;2:22-5. Reprinted with permission.

After taking your medicine

WARNING: This medicine can make you feel sleepy in the first few days of treatment. If it does, do not drive or operate machinery until you feel more alert. If you are at all concerned, speak to your doctor.

This medicine increases the effect of alcohol. **DO NOT DRINK ALCOHOL.**

This medicine sometimes causes side effects. Most people are aware of a dry mouth, this is not serious and indicates that the medicine is having an effect. A few patients experience palpitations, a mild blurring of vision, slowness when they start to pass water or constipation. These effects tend to wear off after a few days of treatment. If they become troublesome consult your doctor.

If you develop any of the following, stop taking the medicine and tell your doctor:

- ◆ skin rash for the first time
- ◆ dizziness when you stand up
- ◆ a persistent sore throat or yellowing of the skin and eyes.

WHAT YOU SHOULD KNOW ABOUT DOTHIEPIN

This leaflet provides some information about your medicine. Please read this carefully before you start to take your medicine. If you have any questions or are not sure about anything, ask your doctor or pharmacist.

The name of your medicine is Dothiepin which contains dothiepin hydrochloride. This is one group of medicines called antidepressants. These help to relieve the symptoms of depression.

Things to remember about your medicine

1. Make sure it is suitable for you to take Dothiepin below.
2. Take the medicine as prescribed by your doctor. Look at the label on the container: it will tell you when to take them. Do not take more than the prescribed amount.
3. Dothiepin sometimes causes problems. You can find these listed on the back of the leaflet.
4. Keep your medicine away from children.

Storing your medicine

Keep your medicine in a safe place where children cannot reach it. Your medicine could harm them.

If your doctor decides to stop the treatment, return any leftover to the pharmacist. Only keep this medicine if the doctor tells you to.

REMEMBER THIS MEDICINE IS FOR YOU

Only a doctor can prescribe it for you. Never give it to others, it may harm them even if their symptoms are the same as yours.

This leaflet does not contain the complete information about your medicine. If you have any questions or are not sure about anything, ask your doctor or pharmacist. They have access to additional information.

5. Remember to return any used medicine to the pharmacist for safe disposal. Do not keep it or give it to anyone else.

Dothiepin can relieve the symptoms of depression. It can also improve anxiety and sleep.

Dothiepin can take up to 2 weeks to work. The first signs you may notice are an improvement in your mood and sleep. Also your appetite may improve if this has been poor. Finally your ability to concentrate may improve.

Before you start taking your medicine

- ◆ Are you pregnant or breast feeding?
- ◆ Do you suffer from heart disease or have you had a heart attack recently?
- ◆ Do you suffer from liver disease, glaucoma or difficulty in passing water?
- ◆ Are you taking any medication for anxiety, "nerves", fits, or high blood pressure?
- ◆ Are you taking, or have you taken, any other treatment for depression in the last 2 weeks?

Treatment of Depression Study



About your Tablets

Dothiepin

University Department of
Psychiatry

If the answer to any of these questions is YES, tell your doctor or pharmacist. Also remember to tell your dentist that you are taking Dothiepin before receiving any treatment from him.

How to take your medicine

Follow your doctor's instructions about when and how to take your medicine and look at the label. Your pharmacist can help if you are not sure.

Dothiepin tablets should be swallowed with a glass or cup of water, milk or other non-alcoholic drink. Doctors often prescribe it to be taken at night, in which case it should be taken 1-2 hours before bed-time.

If you forget to take a dose, wait until the next one is due, then go on as before. Never double-up on the next dose to make up for the one you missed. In the event of an accidental overdose, contact your nearest hospital casualty department or tell your doctor immediately.

Peveler R, George C, Kinmonth AL, Campbell M, Thompson C. Effect of antidepressant drug counselling and information leaflets on adherence to drug treatment in primary care: randomised controlled trial. *BMJ* 1999; **319**:612-15. Not previously published. Reprinted with permission.

Appendix 1. NSAID information sheet.

Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)

NSAIDs are drugs which decrease inflammation and help with pain. They are used in most types of arthritis. There are several different types of NSAIDs and some work better than others in a particular patient.

These drugs should always be taken with food.

Side effects include heartburn, cramps, diarrhea, nausea, fluid retention and increases in blood pressure. These drugs can cause a stomach ulcer. Sometimes they are given along with a pill to protect your stomach from developing an ulcer. If you have had a ulcer before, you are at a higher risk of developing an ulcer when you are taking NSAIDs. Alcohol use and smoking can increase the chance of getting an ulcer from NSAIDs. Prednisone, especially higher doses, can increase the ulcer risk with NSAIDs.

These drugs can increase bleeding and make you bruise more easily. Some people feel 'spaced out' on these medicines.

Sometimes these drugs can cause an asthma attack in patients with asthma. If this occurs, stop the drug and call your doctor. rarely these drugs cause liver problems (hepatitis) or kidney problems. Some people are allergic to them and get a rash. This is uncommon.

While on these drugs, you should not take over the counter medications with aspirin or aspirin like drugs in them including alka seltzer, entrophen, ASA, ibuprofen, motrin, ponstan, and advil. You should also avoid blood thinning drugs while on NSAIDs.

If you have any evidence of bleeding from the bowels, or vomiting coffee-ground like material or black bowel movements, stop the drug and immediately call your doctor.

Call your rheumatologist or your family doctor if you have any questions.

Originally published in Pope JE, Stevens A, Rooks M. A randomized double blind trial of verbal NSAID education compared to verbal and written education. *J Rheumatol* 1998;**25**:771-5. Reprinted with permission.

Benefits and risks disclosed based on the medical practice and reasonable person standards.

Benefits

- (1)^a Carbamazepine is the drug of choice for the type of seizure you are experiencing
- (2)^a Carbamazepine is as, or more, effective than other drugs on the market for controlling seizures
- (3)^a Carbamazepine has been in use for over 10 years and a lot is known about it
- (4)^a People taking Carbamazepine every day tend to feel less tired than people taking other seizure medications
- (5)^a This drug is being recommended because if patients do not take medications to control their seizures, there may be negative, but unpredictable, consequences

Risks and side effects

- (1)^a The manufacturers of Carbamazepine and the FDA are very concerned about the effects of Carbamazepine on the blood and white cells that fight infection; these effects on the blood and white cells, though serious, are rare; we recommend blood tests once a month to monitor these changes
- (2)^a Aplastic anemia, in which the bone marrow that produces white blood cells is damaged is the most serious of these changes; this occurs in less than 1 out of 50,000 patients taking Carbamazepine
- (3)^a Another blood related change is called leukopenia; leukopenia is a decrease in the number of white blood cells which may make it harder for the body to fight infections; most physicians do not believe that this is serious; this problem occurs in approximately 10 out of 100 patients taking this drug and usually goes away with no ill effects; in 2 out of 100 patients, the problem may last longer but still does not appear to cause any difficulties
- (4)^a Another common blood related change is anemia; this is a reduction in the number of red blood cells which may make a person feel tired; this occurs in less than 5 out of 100 persons taking Carbamazepine; usually the blood goes back to normal when the drug is stopped
- (5)^a Allergic rashes can occur; they occur in 1 out of 100 patients taking Carbamazepine; they may be serious, but they are rarely fatal
- (6)^a Abnormalities of liver function have been reported, but they are considered very rare
- (7)^b Serious side effects of the heart and blood vessels can occur; these include heart failure and heart attacks; they have occasionally been fatal.
- (8)^b Doctors estimate that death occurs in less than 1 out of 100,000 patients taking Carbamazepine
- (9)^b Carbamazepine has been reported to cause problems with kidney and bladder function including kidney failure and an inability to urinate
- (10)^b Aching joints, muscles and leg cramps have been reported.

The following side effects are usually related to the amount of medication and how it is taken; they usually go away in time or when the medication is adjusted; 20—50% of patients taking Carbamazepine may have one or two of these problems; many patients will have none

- (11)^a Drowsiness may occur
- (12)^a Dizziness and unsteadiness may occur
- (13)^a Blurred vision may occur
- (14)^b Nausea and vomiting may occur
- (15)^b Loss of appetite may occur
- (16)^b Diarrhea and constipation can occur
- (17)^b There is the possibility that some patients may have side effects or complications that have not yet been identified

^a Items contained in both the MPS and RPS disclosures.

^b Items contained in RPS disclosures only.

Reprinted from: *Patient Educ Couns* 15. Quaid KA, Faden RR, Vining EP, Freeman JM. Informed consent for a prescription drug: impact of disclosed information on patient understanding and medical outcomes. *Patient Educ Couns* 1990;15:249–59. Copyright 1990, with permission from Elsevier.

NSAIDs information leaflet

Information About Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)

NSAIDs are drugs which help to treat pain and inflammation. They may cause serious side effects so the patients who use NSAIDs for long periods of time must know these side effects. Side effects mainly originate from the gastrointestinal system. These are nausea, heartburn, diarrhea, abdominal cramps, stomach ulcer and bleeding from stomach or intestines. Bleeding from the stomach causes a ground coffee-like vomitus. Bleeding from intestines causes black tarry stools. If you have any evidence of bleeding, stop taking the drug and call your doctor immediately.

NSAIDs can increase bleeding in the other parts of the body and you may bruise more easily. Do not take so called 'blood thinning drugs' while using these drugs. So avoid taking Aspirin while using NSAIDs. NSAIDs can sometimes cause asthma attacks. If this occurs stop the drug and call your doctor. Some rare side effects of NSAIDs include liver problems, kidney problems and allergic reactions with rashes.

Never take your NSAIDs on an empty stomach. If you have any questions call your rheumatologists.

Originally published in Savas S, Evcik D. Do undereducated patients read and understand written education materials? A pilot study in Isparta, Turkey. *Scand J Rheumatol* 2001;**30**:99–102. Reprinted with permission.

*Patient package insert for a trial medicine***Indication**

This medicine is prescribed for the treatment of high blood pressure.

How to use and how much to use

The appropriate amount to take is one tablet a day taken as a single daily dose in the morning. You can take the tablets before, during or after breakfast.

When not to use

- Patients suffering from severe trouble with heart beat rhythm (second or third degree block).
- Children under 14 years of age.
- Patients with kidney disease.
- Patients taking verapamil, a medicine given for some diseases of the heart. Your physician will ask you to stop taking verapamil some days before you start to take this medicine.
- Patients who are unusually sensitive to any component of this medicine.

Unwanted effects

Not uncommon side effects of this medicine are: feeling dizzy, headache, fatigue and diarrhea.

Sometimes, you can feel muscle weakness or cold feet. More seldom, you may have some difficulty to sleep. Whenever you experience one of these side effects, inform your physician at your next visit.

Your pulse rate may slow down. Whenever this causes trouble (say less than 55 beats per minute), consult your treating physician.

Patients suffering from asthma may experience a crisis. Patients suffering from heart failure may see their condition get worse. In these cases, consult your treating physician.

Exceptionally the following symptoms appear: cough, nausea, skin rash, a drop of blood pressure, chest pain and palpitations. You might feel dizzy when standing up. Do consult your physician whenever one or more of these symptoms occur.

Exceptionally, one can experience a swelling of the face, lips, tongue or throat. Difficulties with breathing may accompany this swelling. When these signs appear, you should stop immediately taking the medicine. Consult your physician right away. These very rare symptoms mean that you have become unusually sensitive towards the medicine.

Whenever you experience any strange feeling or symptom that worries you, consult your physician.

Special precautions

Patients have to tell their physician when they recently suffered from vomiting or diarrhea. In case you follow a low salt diet, you should inform your physician. It may decrease the amount of salt in the blood and prevent the medicine from working well. Do not interrupt the treatment suddenly. The treating physician will closely supervise you and decide when this treatment needs to be stopped. The physician will monitor closely patients suffering from heart failure, low pulse rate or palpitations, kidney disease. When you need to be anesthetized for surgery, be sure to mention your present use of medicines.

Pregnancy and nursing

If you are pregnant or intend to become pregnant, you must inform your physician. Pregnant or nursing women must not take this medicine.

Other medicines

Whenever you take other medicines, problems may arise. Inform your physician about all the medicines you are taking.

Patients taking clonidine have to follow very strictly their physician's guidelines. It might be dangerous to stop both these medicines at the same time.

Driving vehicles and using machines

This medicine does not hinder safety in traffic or at work.

What to do in case of overdose

When somebody takes too many pills of this medicine his blood pressure will drop and the pulse rate will slow down. Patients who take an overdose of this medicine must be taken to a hospital immediately. In this case always notify your prescribing physician.

Packaging

Your physician prescribed this medicine for use in a scientific study. The tablets are packed in a round bottle which contains 60 tablets.

How to store the medicine

Store at room temperature (15–25°C) and protect from light or humidity.

Originally published in Vander Stichele RH, Thomson M, Verkoelen K, Droussin AM. Measuring patient compliance with electronic monitoring: lisinopril versus atenolol in essential hypertension. *Post Marketing Surveillance* 1992;6:79–90. Reprinted with permission.

Experiment 1	Cisapride in benign gastric motility disorders
<p>Introduction script: Since a few days you are feeling a bit nauseous and you lost your appetite. You experience difficulty to properly digest your food and you suffer from a bloated feeling in the stomach. Because this is really annoying, you decide to go and see the doctor. The doctor examines you and pushes on your stomach. This hurts a little bit. The doctor reassures you and gives you a prescription for [cisapride]. He tells you to take one tablet, a quarter of an hour before each meal. In case the problems would not subside, you should come and see the doctor again. After you purchased the medicine, you go home. At home you open the package.</p> <p>Benefit message: In normal digestion ingested food flows in one direction from the mouth to the stomach and then to the digestive tube. Little muscles at the entrance and at the exit of the stomach keep the food from flowing back. Other muscles inside the stomach and in the intestines mould the food and push it further. [Cisapride] helps these little muscles to work well together. This favours a good digestion.</p>	
Experiment 2	Itraconazol in fungus infection of the toe nails
<p>Introduction script For some months now, you noticed that 3 of the five nails of your left foot show an ugly colour. This seems to get bigger and to grow towards the base of the nail. Your doctor has told you that this is an infection by fungus. The infection will not go away by itself but it will not make you ill. You agreed with the doctor that it was better to cure this infection. In the first week of next 3 months, you must take one tablet of [itraconazol] every day. Within four months you should pay a visit to your doctor to inspect your nails. After you purchased the medicine you go home. At home you open the package.</p> <p>Benefit message: A fungus can cause infection of one or more toenails. [itraconazol] stops the growth of the fungus and kills it. Once the fungus is killed by [itraconazol], a healthy nail will grow back. The healing process takes time. Therefore, the signs of infection can still be present for a while. It can take several months before the nail looks completely healthy.</p>	
Experiment 3	Risperidon in chronic psychosis
<p>Introduction script: You have taken on the task of being the daily caregiver of a psychiatric patient with chronic psychosis. This patient has been prescribed [risperidon]. This medicine needs to be taken on a daily basis, and it is your task to supervise the treatment. After you purchased the medicine you go home. At home you open the package.</p> <p>Benefit message: Psychosis is a mental disease, in which the working of the brain is disturbed as to thinking, feeling and acting. The symptoms can be: confusion, hallucinations, distortions in hearing and sight, paranoia, feelings of anxiety and tension. [risperidon] relieves the symptoms of chronic psychosis, and helps to restore normal social function in society. It is often necessary to take the medicine continuously for a long time to suppress the signs of the disease. When treatment is stopped, symptoms can return.</p>	

Originally published in Vander Stichele RH, Vandierendonck A, De Vooght G, Reynvoet B, Lammertyn J. Impact of benefit messages in patient package inserts on subjective drug perception. *Drug Inf J* 2002;**36**:201–8. Reprinted with permission.

Effets Indésirables

La théophylline peut parfois entraîner une irritation gastrique (douleurs, nausées), des maux de tête, de l'insomnie, des palpitations, dans ce cas, consultez votre médecin.

Photograph of the part of Düacrine® (slow-release theophylline) manufacturer's insert devoted to side-effects (EFFETS INDÉSIRABLES). Translated from French it reads: Theophylline can sometimes cause gastric irritation (aches, nausea), headaches, insomnia, palpitations, in this case, consult your physician.

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The Correspondence Page on the HTA website (<http://www.hta.ac.uk>) is a convenient way to publish your comments. If you prefer, you can send your comments to the address below, telling us whether you would like us to transfer them to the website.

We look forward to hearing from you.