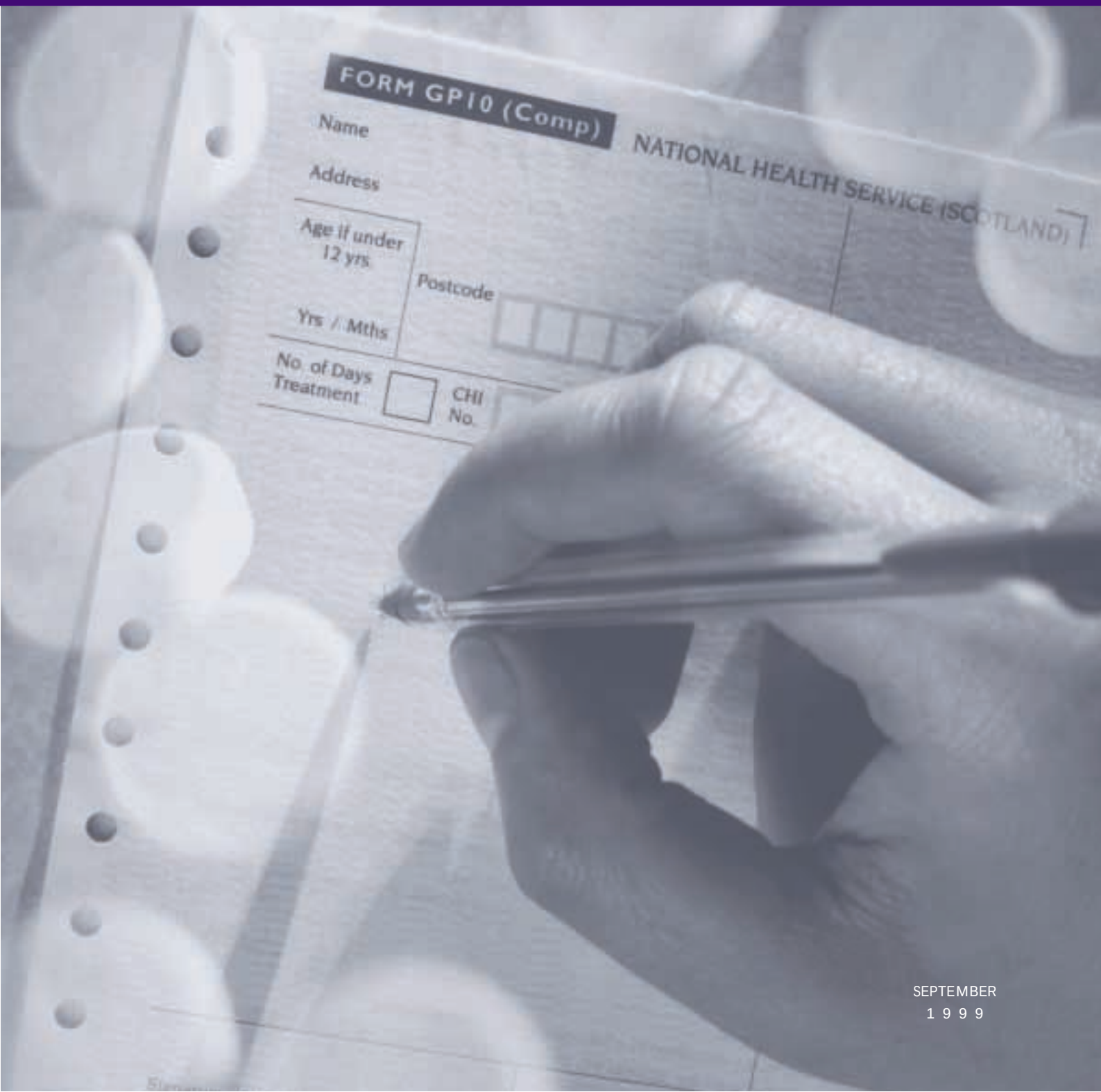
Accounts Commission for Scotland

# Supporting prescribing in general practice

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The Accounts Commission is a statutory, independent body, which, through the audit process, assists local authorities and the health service in Scotland to achieve the highest standards of financial stewardship and the economic, efficient and effective use of their resources.

The Commission has five main responsibilities:

- securing the external audit
- following up issues of concern identified through the audit, to ensure satisfactory resolutions
- reviewing the management arrangements which audited bodies have in place to achieve value for money
- carrying out national value for money studies to improve economy, efficiency and effectiveness in local government and the NHS
- issuing an annual direction to local authorities which sets out the range of performance information which they are required to publish.

The Commission secures the audit of 32 councils, 34 joint boards (including police and fire services), 15 health boards, 28 NHS trusts and six other NHS bodies. Local authorities spend over £9 billion of public funds a year and the NHS in Scotland spends over £4 billion.

The Commission's Health and Social Work Studies Directorate is responsible for managing a national programme of value for money studies. This study of GP prescribing is part of the 1998-99 programme. The study was developed by John Simmons, Jim Kinney and Karen Jack, under the direction of Caroline Gardner, Director of Health and Social Work Studies.

ACKNOWLEDGEMENTS

We are grateful to Dr Jan Jones, Pharmaceutical Prescribing Advisor, Tayside Health Board and Dr Beth Rimmer, Medical Prescribing Advisor, Western Isles Health Board, who provided valuable support and advice during the development of the project and in the drafting of this report. We also appreciate the provision of base data and advice by PPD.

Finally we would like to thank the members of the advisory panel for their advice and comments, and the many individuals and organisations who generously offered their time and comments during both the study and the production of the report.

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# Executive summary

The NHS in Scotland has worked hard over the past ten years to improve the quality and cost-effectiveness of prescribing, involving GPs, pharmacists and managers in a range of initiatives. Quality has improved, and there has been a substantial increase in generic prescribing, which has saved money without affecting the quality of prescribing for patients. At the same time, however, expenditure on prescribing is still rising at a faster rate than other NHS spending.

The new NHS structures and funding flows provide an opportunity for further improvements. GPs, often working together in Local Health Care Co-operatives, are part of the new Primary Care Trusts, and expenditure on GP prescribing has been brought together in a single budget with the resources used to provide hospital and community health services. This means that it should be easier to draw up shared protocols for the best use of drugs in treating patients, and for any savings from more effective prescribing to be reinvested in higher quality prescribing or other patient services.

However, there is still significant variation in prescribing between GP practices, and not all of the variation can be explained by differences in their practice populations. This suggests that there is still great potential for improving quality and reducing costs. Realising these improvements is likely to depend on:

- commitment from all involved (GPs, pharmacists and trust and health board managers) to work together
- good information to identify where there is scope for change
- support for GPs in identifying the most appropriate drug treatment for individual patients and in working with those patients to explain the reasons for any changes.

This report provides new information on prescribing patterns to identify a range of areas where improvements in quality and cost effectiveness are possible, and highlights good practice in providing support to GPs. The most important areas for change include:

- the indicators of prescribing quality identified by the Primary Care Development Fund, which focus on the most effective drug treatments for particular conditions such as asthma, hypertension and bacterial infection
- the development and use of formularies of drugs, which allow GPs to build up their experience and knowledge of a small number of drugs for a particular condition, and therefore increase the quality and safety of prescribing
- reducing the use of drugs which are classed as ‘less suitable for prescribing’ by the British National Formulary

- further increasing the use of cheaper, generic equivalents instead of branded drugs, where these are available. Generics are usually identical to their branded counterparts, and offer the opportunity for significant savings without affecting the quality of care received by patients

- the substitution of therapeutically similar drugs both in terms of efficiency and safety. Each patient for whom therapeutic substitution might be appropriate has to be considered on an individual basis. For several reasons substitution will not be appropriate for a proportion of patients

- avoiding the use of premium priced versions of drugs wherever possible. Many drugs are produced in more than one form, perhaps as slow release or effervescent tablets as well as the standard version. These premium priced preparations may offer important advantages to some patients, particularly older people, but for most people the same treatment effect can be achieved at much lower cost by using the standard format

- reducing the use of drugs of limited value which are considered, by the BNF, not to have been established as effective or to provide only slight relief of patients' symptoms

- reducing the use of over-prescribed drugs, particularly the newer antibiotics. These drugs are more expensive than their established counterparts, and widespread use risks limiting their effectiveness through the development of immune strains of bacteria

- managing repeat prescriptions better, so that unnecessary treatment is avoided and the risk of unwanted side effects from combinations of drugs is minimised.

If all of these improvements could be achieved, the quality of prescribing would increase to the benefit of patients, and annual savings of in the region of £26 million could be made. It will take time and commitment if these savings and quality improvements are to be realised, but savings could be reinvested in the NHS in Scotland to fund effective new treatments, or to develop new services for patients. The challenge is for all involved - GPs, pharmacists and managers - to identify the priorities for change locally, and to communicate with patients to achieve those improvements in practice.

# Introduction

## Why look at GP prescribing?

For most people, the most frequent contact with the health service is through their general practitioner (GP). This consultation often leads to a prescription for medicines, either as a one-off treatment or as part of long-term management for a chronic condition. The quality of prescribing therefore has a direct impact on the quality of care patients receive. In addition, GP prescribing costs approximately £575 million each year, and accounts for about 12% of NHS expenditure in Scotland.

The White Paper *'Designed to care'* heralded significant changes in the way primary care services are organised. The introduction of primary care trusts (PCTs) and local health care co-operatives (LHCCs) offer new ways for GPs to work with each other and with other health professionals to plan the way in which care should be provided. Single stream funding means that any savings which can be made by improved prescribing can be reinvested in other services, while overspends will have to be managed within the overall primary care budget.

GP prescribing represents around a quarter of the expenditure of a typical PCT. Expenditure on prescribing has been increasing at an average of 8% a year for the last four years, due to a combination of a 3-4% annual increase in the number of prescriptions prescribed, changes in the prices of drugs, the introduction of new drugs, and changes in prescribing practice. At the same time, GPs have been working with prescribing advisors and others to increase both the quality and the cost effectiveness of prescribing. For example, the proportion of generic drugs prescribed in place of their more expensive branded counterparts has increased from 40% in 1992/93 to 67% in 1998/99. It is not possible to say precisely how much this has saved, because of wider changes in both drugs and prescribing habits, but there is no doubt that the savings amount to tens of millions of pounds.

Prescribing is influenced by a number of factors, some of which can be controlled or influenced by GPs, and others which are outside their control. The age and sex of the patients who make up a GP's list, together with the number of temporary residents treated, will have a significant impact on prescribing expenditure, but cannot be controlled. The level of ill health within the practice population will also be affected by factors over which the GP has no control, although wider social policies may have an impact over the longer term. Other factors affecting prescribing include the considerable influence of hospital recommendations and treatment, the organisation of services between hospitals and primary care, new ways of treating particular conditions, patient demand and the influence of the pharmaceutical industry.

However, even when practices that appear to have similar patient populations are compared, prescribing patterns vary considerably. This variation is often caused by characteristics of doctors themselves, such as differences in diagnostic behaviour, and different approaches to managing particular health problems, for example, whether or not to issue a prescription and which drug to choose.

## Aim of the study

The aim of this study is to produce information to help PCTs, LHCCs, GPs and health boards to continue to improve both the quality and the cost effectiveness of GP prescribing. The specific objectives are to:

- highlight the significant cost savings which could be achieved by better management of prescribing, while maintaining or improving prescribing effectiveness. Potential sources of savings include:
  - reducing the use of drugs with little therapeutic value
  - reducing inappropriate over-prescribing
  - improving the use of generic drugs
  - reducing the use of premium price preparations
  - increasing the use of therapeutically equivalent substitutes.
- highlight areas where improved management of prescribing could bring improvements in quality and cost effectiveness.

## Approach

The study is based on an approach developed by the Audit Commission in England and Wales, adapted to Scottish circumstances. It was carried out in collaboration with health board Medical Prescribing Advisors (MPAs) and Pharmaceutical Prescribing Advisors (PPAs), and with the support of an advisory panel drawn from across Scotland. The study involved interviews with those involved in prescribing - mainly MPAs, PPAs, GPs and pharmacists - and detailed analysis of prescription data.

A series of prescribing indicators was selected to provide a mix of indicators of good clinical practice and cost effectiveness, after consultation with MPAs and PPAs. Nine quality indicators were drawn from a Primary Care Development Fund report[1] , together with two indicators of formulary compliance and a new indicator of drugs 'less suitable for prescribing' taken from the British National Formulary[2] . The cost effectiveness indicators are based on those used by the Audit Commission[3]. These indicators were then calculated for each general practice in Scotland.

In order to allow valid comparisons to be made between practices and health boards, it is necessary to make two sets of adjustments to this prescribing data:

- Each practice's population must be weighted for the factors which affect prescribing and over which the practice has no direct control.
- The quantity of a drug included on each prescription must be standardised.

In the first case, the main influences are the age and sex composition of the practice population, the number of temporary residents, and the level of morbidity. However, there is currently no reliable way of adjusting for morbidity at practice level, and so we were only able to adjust for the other three factors. The weighting system used is known as SCOTR PU, which is based on Scottish data and updated regularly. Appendix 1 contains a discussion of the other weighting systems available.

To standardise the quantity of a drug prescribed, Defined Daily Doses (DDDs) were used. This is necessary because different doctors may routinely prescribe different quantities of the same drug.

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1 Primary Care Development Fund *'Prescribing indicators'*, November 1996.
2 Drugs marked in the March 1999, BNF as 'less suitable for prescribing'.
3 Audit Commission, *'A Prescription for Improvement'*, 1994.

*Example*

Doctor A prescribes 100 tablets at 5mg and Doctor B prescribes 50 tablets at 2.5mg. Comparing the number of prescription items issued, the two doctors' prescribing looks identical, with one prescription item each. Using DDDs, however, it is clear that Doctor A has prescribed four times as much of the drug as Doctor B (100 x 5mg = 500 compared to 50 x 2.5mg = 125).

In most cases, DDDs were taken from the World Health Organisation (WHO), but additional information was provided by Pharmacy Practice Division (PPD), Margaret Maxwell of Edinburgh University and Professor Stephen Chapman of Keele University.

These adjustments help to improve the usefulness of the comparative information we have produced. However, they are not ideal: because the comparisons do not take account of morbidity, all comparisons need to be understood in the context of local knowledge about individual practices. Even if an appropriate measure of morbidity is developed, other factors such as small numbers of patients on very expensive drugs will mean that local interpretation is still needed. They do, however, provide a valuable starting point for examining prescribing and looking at ways to improve it.

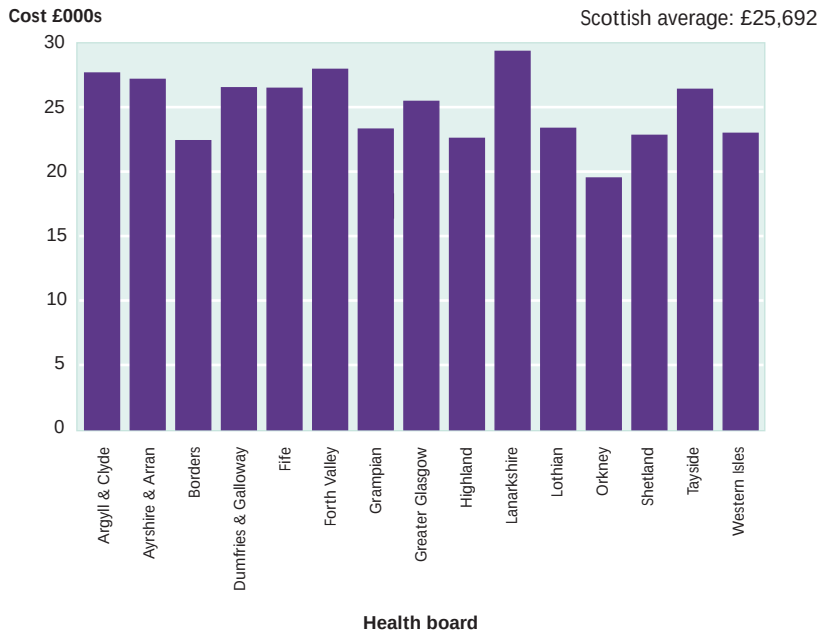
The Accounts Commission is therefore supplying prescribing advisors at PCTs and health boards with individual practice analysis of the quality and cost indicators used in this report. These analyses make use of DDDs and SCOTR PU which have not been available to prescribing advisors in the past. We hope that this information will assist prescribing advisors and practices to identify where improvement might be made. If it is considered useful we will continue to supply this information on a quarterly basis for a limited period until Information & Statistics Division (ISD) take over.

# Overview

This section provides some broad comparative information on prescribing; more detailed quality and cost indicators are discussed in the following two sections. It examines the overall level of expenditure on drugs prescribed by GPs in Scotland, and explores some of the high level trends in these costs.

The total cost of drugs prescribed by GPs was almost £575 million in 1998/99. Within this there is significant variation in the cost per patient among health boards, even after adjusting for the age and sex of the population, and for temporary residents (Exhibit 1).

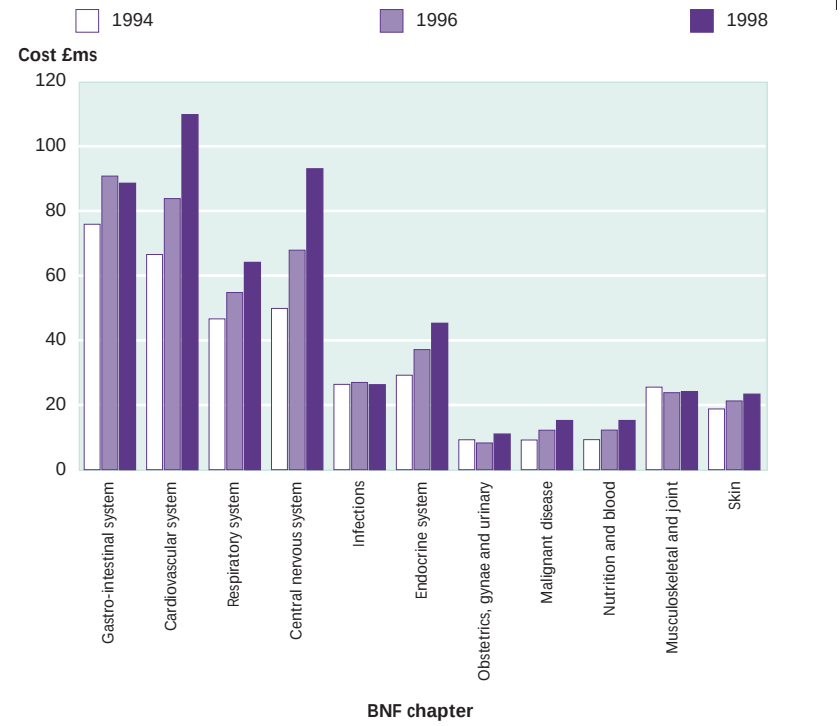
**Exhibit 1: Health board expenditure per 1000 SCOTR PUs in 1998**




This expenditure can be analysed further by using the British National Formulary (BNF)[4]. The BNF describes the drugs available for prescribing and each chapter is related to a system of the body or to an aspect of medical care. Breaking prescribing down into the chapters can indicate which groups of drugs are producing rising expenditure, and which are contributing to falling expenditure (Exhibit 2).

[4] The BNF is produced by the British Medical Association (BMA) and the Royal Pharmaceutical Society of Great Britain.

**Exhibit 2: Change in main BNF chapter costs 1994-98**




Drugs for cardiovascular and central nervous system conditions have shown the greatest cost increases over the last two years, followed by drugs for the respiratory and endocrine systems. Expenditure on drugs for gastro-intestinal, infections, and musculoskeletal conditions has reduced. The first four chapters (gastro-intestinal, cardiovascular, respiratory, and central nervous systems) account for 65% of expenditure, and include the two groups where expenditure is rising fastest.

**Cardiovascular:** Scotland has particularly high levels of cardiovascular disease, and one of the clinical priorities for the NHS over the last few years has been coronary heart disease and stroke. There is clear evidence that ACE inhibitors (for heart failure) and statins (which lower cholesterol levels) have an important part to play in managing cardiovascular disease[5], so increased expenditure on these drugs is to be expected. These figures show a 30% increase over two years which, if targeted effectively, should lead to substantial health gain in the longer term.

**Central nervous system:** This group contains a variety of drugs used to treat a wide range of conditions including antidepressants, antipsychotics, analgesics, anti-epileptic drugs and therapy for Parkinson's disease. Recent work has increased recognition of depression by GPs and has stressed the benefits of early and adequate drug treatment[6]. The switch from tricyclic antidepressants to

[5] SIGN: *'Management of Diabetic Cardiovascular Disease'*, 1997, SHPIC report, *'Heart Failure'*, 1998.

[6] Paykel ES,Priest RG. *'Recognition and management of depression in general practice:consensus statement'*, BMJ 1992.

much more expensive selective serotonin re-uptake inhibitors (SSRIs) and other new antidepressants has also caused an increase in expenditure. SSRIs and other new antidepressants now account for more than 80% of the total cost of antidepressants, but there is controversy over whether the greater expense of SSRIs is justified by the clinical advantages[7,8]. Expenditure increased by 37% from 1994 to 1996 and by a further 37% from 1996 to 1998.

**Gastro-intestinal:** The small change in expenditure for this group of drugs is due to two opposing factors: a sharp fall in the price of ranitidine (which is now off patent) has reduced expenditure, while the continuing shift from H2-receptor antagonists to proton pump inhibitors has driven expenditure up. This is due to changes in GPs' prescribing habits. This group of drugs clearly illustrates the need to understand the reasons underlying overall changes in expenditure.

**Respiratory:** Expenditure on this group of drugs has risen by 37% in the last four years. A large part of this increase is due to increased prescribing of inhaled steroids for asthmatic patients, following the publication of the British Thoracic Society guidelines on asthma management[9] which stress the importance of preventative medication and improved monitoring of asthmatic patients by GPs. The increase would have been larger but for a partly compensating reduction in expenditure, caused by increased prescribing of generic drugs in place of their more expensive branded counterparts.

**Musculoskeletal:** Expenditure on this group of drugs has remained relatively constant over the last four years, with a slight drop over the last two years. This is due to:

- reduced prescribing as the dangers associated with the use of non-steroidal anti-inflammatory drugs (NSAIDs), particularly in older people, are recognised
- the prescribing of more appropriate alternatives based on comparative safety data
- the increasing use of generic equivalents.

There are a number of alternative NSAIDs recently licensed and in development. It is therefore possible that the introduction of these drugs will alter prescribing in this area. This is another example of why any indicators or assessments of prescribing need to take account of the constantly changing selection of drugs available.

Analyses at BNF chapter level offers health boards and PCTs some broad pictures of their overall prescribing patterns. For example, Greater Glasgow Health Board is below the average cost for most groups of drugs, but above average for the central nervous system group. This type of analysis can help to provide a broad understanding of the patterns of prescribing in a particular area. However, for GPs to be able to monitor and manage their prescribing more effectively, much more detailed analysis is needed, covering both quality and cost. Specific indicators of these aspects of prescribing are explored in the following sections.

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7 Effective Health Care. *'The management of depression in primary care'*. Leeds University, 1993.

8 Song F *et al,* 'Selective serotonin re-uptake inhibitors: meta-analysis of efficacy and acceptability'. BMJ 1993; 306: 683-7.

9 British Thoracic Society, Royal College of Physicians of London, The King's Fund Centre, National Asthma Campaign, et al. *'The British guidelines on the management of asthma'*, 1995.

# The quality agenda

## Indicators of prescribing quality

This chapter contains indicators of prescribing quality, drawn up in collaboration with medical and pharmaceutical prescribing experts. They offer a valuable way of exploring prescribing patterns in more detail. There is, however, an unavoidable gap in this analysis. The information available on prescriptions at national level contains no link to the diagnosis or symptoms for which they were issued. For this reason, the indicators must be treated with caution. They show real variation in prescribing, and they may reflect variations in quality, but each indicator needs to be investigated locally in the light of detailed information about practices and their patients.

All but one of the indicators in this section of the report are based on those used in the Primary Care Development Fund (PCD) report *'Prescribing Indicators'*. The Audit Commission used a number of similar (although not identical) indicators. In both cases the studies had large advisory groups drawn from a wide range of experts involved with GP prescribing.

The indicators used to examine the quality of clinical practice are set out below.

| Indicator | Comment |
|---|---|
| Inhaled steroids & cromoglycates as a percentage of inhaled steroids and cromoglycates and $Beta_2$ agonists | For most patients with asthma, preventative therapy is the preferred treatment, in accordance with the British Thoracic Society (BTS) and SIGN[10] guidelines. Inhaled steroids are the preferred preventative treatment. This analysis is however complicated by moves to reassess and decrease inappropriate inhaled steroid prescribing for COPD. |
| Inhaled $Beta_2$ agonists as a percentage of all $Beta_2$ agonists (oral and inhaled) | Short acting inhaled beta-agonist therapy is preferred over oral therapy in the treatment of asthma. Oral therapy is normally reserved for the very young, the very old, or for treating acute asthma. |
| Bendrofluazide 2.5mg tablets as a percentage of the total use of all bendrofluazide (2.5mg + 5mg tablets) | Bendrofluazide 2.5mg is as effective as 5mg in controlling hypertension,and is associated with a lower incidence of side effects, particularly metabolic effects. However, higher doses are sometimes used to treat heart failure. A relatively low use of bendrofluazide 2.5mg may indicate a lack of appreciation of current concepts in the treatment of hypertension. |
| Amoxycillin as a percentage of amoxycillin and co-amoxiclav | For most indications, amoxycillin is as effective as co-amoxiclav and has fewer side effects. |
| Established oral antibiotics as a percentage of all oral antibiotics | There is concern about the increasing resistance of micro-organisms to antibiotics. The use of the new antibiotics when established antibiotics would be as effective potentially undermines the effectiveness of these newer antibiotics. |
| Single diuretics as a percentage of single and combination diuretics | The rationale behind the development of combination diuretics revolves around the issue of hypokalaemia. However, most patients do not develop clinically significant hypokalaemia unless large doses are used. It is now generally accepted that combined diuretics (loop or thiazide combined with potassium sparing agent or potassium supplement) are over prescribed and that single agents (thiazide or loop diuretics) are all that are necessary in most cases. |
| Hypnotic and anxiolytic drugs, DDDs, per 1000 patients, per month | Hypnotics and anxiolytics should be reserved for short courses to alleviate acute conditions after causal factors have been established. BNF 37 edition. |

In addition there are two indicators of formulary compliance. A formulary is a list of selected drugs, sometimes accompanied by guidance and protocols for their use, which many health boards and some GP practices have developed. They are seen as a marker of good quality prescribing, since they enable the GPs within the practice to develop extensive experience of working with a limited range of drugs, and to develop shared strategies for improving the safety, effectiveness and cost effectiveness of their prescribing. Drugs in a formulary should have a good combined profile of efficacy, safety, acceptability and cost.

Our analysis is based on the four most common drugs prescribed in each practice. However, the clinical appropriateness of the drugs chosen by individual practices needs to be considered separately.

| Indicator | Comment |
|---|---|
| Use of the top four NSAIDs expressed as a percentage of the use of all NSAIDs. | Each practice should be consistent in its use of NSAIDs. Four should be adequate to meet 90% of all the prescriptions for NSAIDs. |
| Use of the top four beta-blockers expressed as a percentage of the use of all beta-blockers. | Four beta-blockers should be adequate in most situations. |

[10] SIGN: *'Primary Care Management of Asthma'*, 1998.

The final indicator of the quality of prescribing is based on the level of prescribing of the drugs considered by the Joint Formulary Committee to be 'less suitable for prescribing'. These drugs are highlighted in the BNF.

| Indicator | Comment |
|---|---|
| Use of drugs marked in the 37 edition of the BNF as 'less suitable for prescribing' | Although the drugs in this section may not be considered as drugs of first choice, their use may be justified in certain circumstances. |

## Changes over time

All nine quality indicators used in the 1996 PCD report were compared with 1998 data (Exhibit 3 below).

**Exhibit 3: Comparison of indicators over time**

| Indicator | Median January - June 1995 (%) | Median 1998 (%) |
|---|---|---|
| Inhaled steroids & cromoglycates as a percentage of inhaled steroids & cromoglycates & beta$_2$ agonists | 41 | 42 |
| Inhaled beta$_2$ agonists as a percentage of all beta$_2$ agonists | 99.87 | 98 |
| Bendrofluazide 2.5mg tablets as a percentage of the total use of all bendrofluazide | 60 | 78 |
| Amoxycillin as a percentage of amoxycillin and co-amoxiclav | 68 | 80 |
| Established oral antibiotics as a percentage of all oral antibiotics | 94 | 94 |
| Single diuretics as a percentage of single and combination diuretics | 71 | 72 |
| Anxiolytic and hypnotic drugs, DDDs, per 1000 patients per month* | 804* | 677* |
| Top four NSAIDs as a percentage of all NSAIDs (exclusions include combinations with misoprosol) | 80 | 79 |
| Top four beta-blockers as a percentage of all beta-blockers | 95 | 93 |

* This indicator does not use percentages and unlike the other indicators, a smaller figure is better.

Three of the indicators show improvement over the three year period, highlighting overall progress in improving the quality of prescribing. Five indicators show little or no change. Only one drug shows a fall in performance and this apparent fall needs to be treated with caution: the 1995 figure for inhaled beta$_2$ agonists was 99.87%, which is exceptionally high, and it is possible that this figure is not directly comparable with the 1998 figure. Overall, these indicators point to an improvement in the quality of prescribing. Appendix 2 shows each indicator by health board.

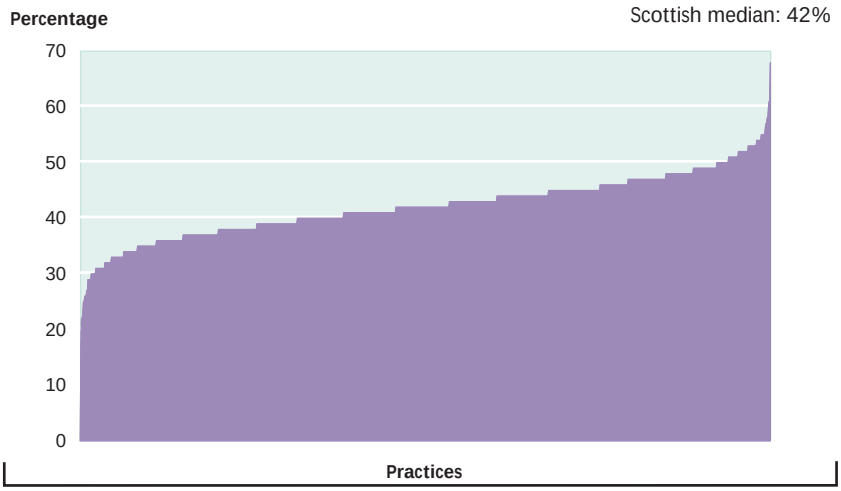
## Variation between practices

These overall figures conceal wide variations between practices across Scotland. The performance for each indicator of prescribing quality is analysed by practice in the sections that follow.

### *Inhaled steroids & cromoglycates as a percentage of inhaled steroids & cromoglycates & beta$_2$ agonists*

There is comparatively little variation between practices, with 90% of all practices ranging between 33% and 51% (exhibit 4). This suggests a high level of agreement amongst GPs on the appropriate level of prescribing.

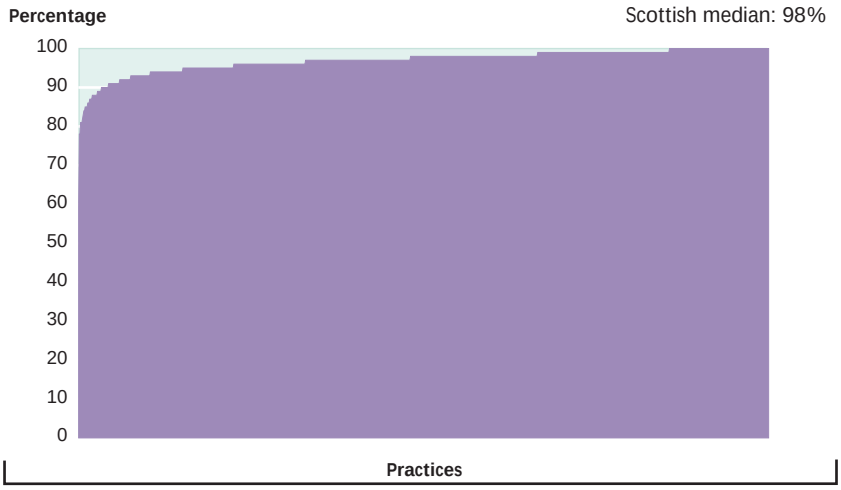
**Exhibit 4: Inhaled steroids and cromoglycates as a percentage of inhaled steroids and cromoglycates and beta$_2$ agonists (based on DDDs in 1998)**




### *Inhaled beta$_2$ agonists as a percentage of all beta$_2$ agonists*

Again the variation is relatively small; for 90% of all practices the percentage lies between 91% and 100%. The Scottish median is 98%.

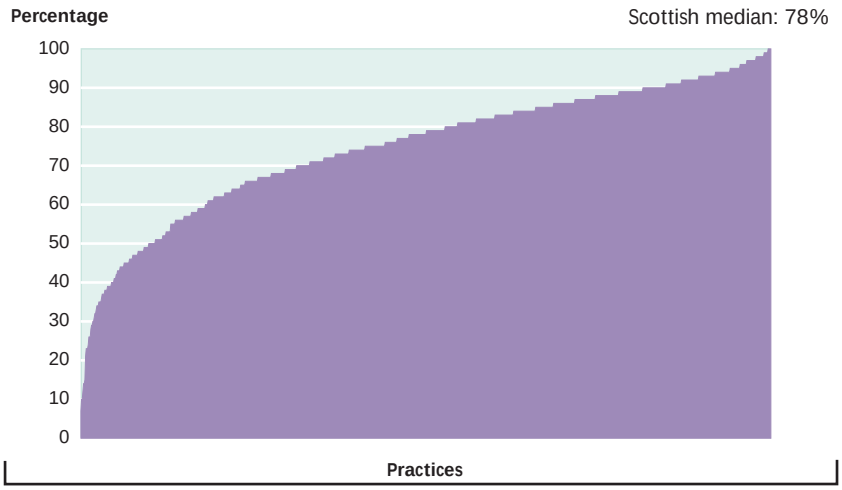
**Exhibit 5: Inhaled beta$_2$ agonists as a percentage of all beta$_2$ agonists (based on DDDs in 1998)**



### *Bendrofluazide 2.5mg tablets as a percentage of all bendrofluazide*

There has been a large increase in the percentage of bendrofluazide that is dispensed in 2.5mg form (from 60% to 78% in three years), indicating improvements in prescribing. However, there are still many practices where there is scope for an increase in the proportion of 2.5mg bendrofluazide prescribed (Exhibit 6).

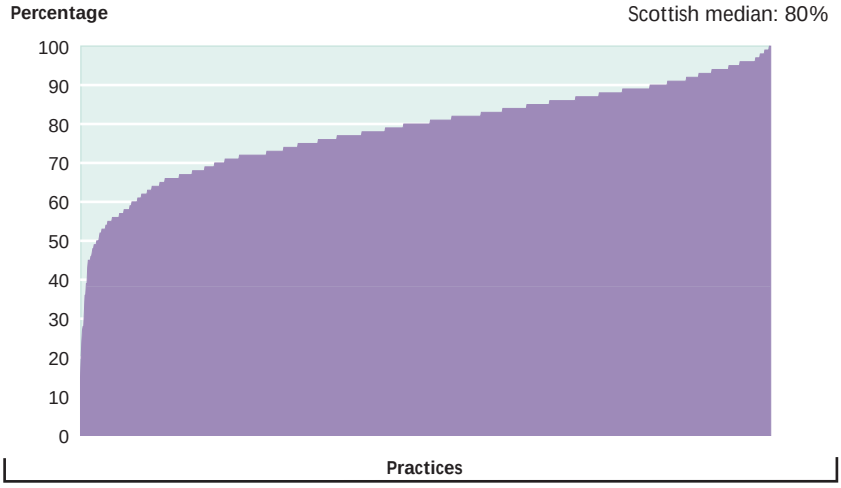
**Exhibit 6: Bendrofluazide 2.5mg tablets as percentage of the total use of all bendrofluazide (based on number of tablets in 1998)**




### *Amoxycillin as a percentage of amoxycillin and co-amoxiclav*

The improvement in performance over the last three years is very marked, from 68% to 80%. Ten percent of practices now prescribe more than 90% amoxycillin as a percentage of amoxycillin and co-amoxiclav. However, there is a wide variation between practices, with 20% of practices still below the median of three years ago. This indicates there is potential for further improvement in some practices.

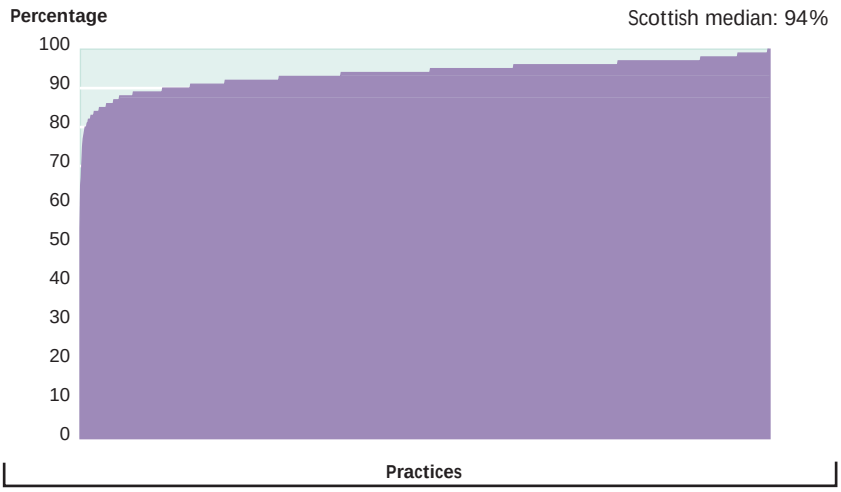
**Exhibit 7: Amoxycillin as a percentage of amoxycillin and co-amoxiclav (based on DDDs in 1998)**



*Established oral antibiotics as a percentage of all oral antibiotics*

There has been virtually no change in the percentage use of the established antibiotics. There is some variation between practices, but 90% of all practices lie between 86% and 98% (Exhibit 8).

**Exhibit 8: Established oral antibiotics as a percentage of all oral antibiotics (based on DDDs in 1998)**

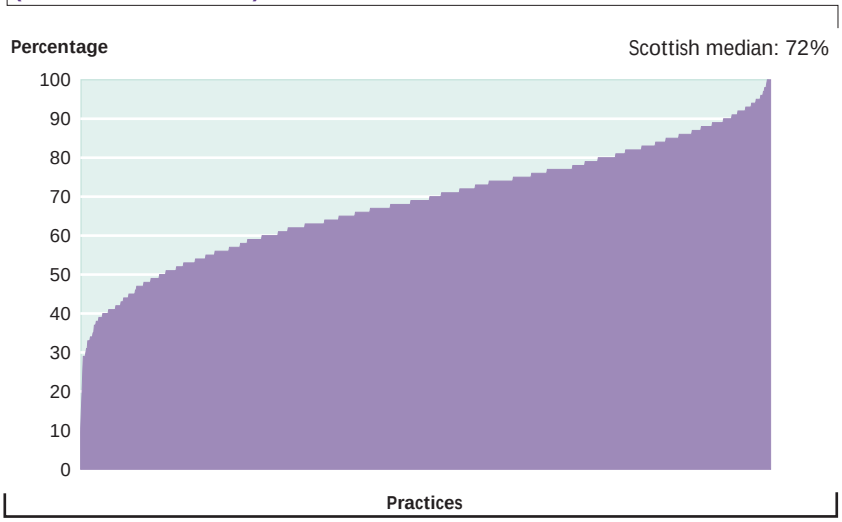



*Single diuretics as a percentage of single and combination diuretics*

The Primary Care Development Fund report adopts this as an indicator of good clinical practice since combined diuretics are over prescribed, and single agents are all that are necessary in most cases. The analysis of the data suggests there has been little change over the last three years. This is an area where greater use of single diuretics can not only improve quality but also produce savings which release money for other types of health care.

There is significant variation for this indicator: 90% of practices lie between 41% and 91%. This is an indicator which warrants further investigation at practice level.

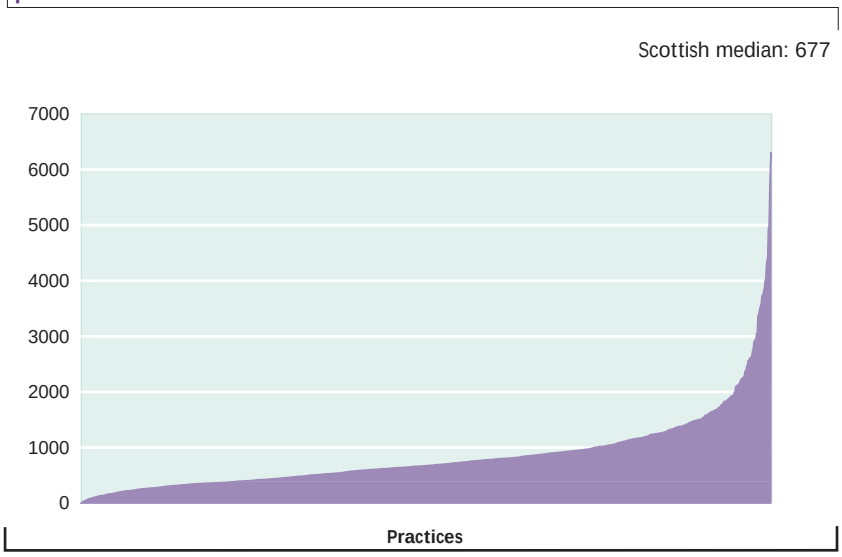
**Exhibit 9: Single diuretics as a percentage of single and combination diuretics (based on DDDs in 1998)**



### *Hypnotic and anxiolytic drugs, in DDDs, per 1000 patients, per month*

There has been a marked improvement in this indicator over the last three years, but there is still wide variation between practices (Exhibit 10). One factor which may affect the level of prescribing is high doses being prescribed to drug misusers. However, once the highest prescribing practices have been excluded, there is still a ten-fold difference between those practices at the fifth percentile (188) and those at the 95th percentile (2120). Again, this is an indicator which could benefit from a review at practice level.

**Exhibit 10: Hypnotic and anxiolytic drugs in DDDs per 1000 patients per month in 1998**




This analysis of specific indicators shows those where there is scope for more improvement across Scotland. The priorities for individual practices, however, will be different, and this reinforces the need for local analysis and joint agreement between individual practices and their prescribing advisors.

## Drugs 'less suitable for prescribing'

The final indicator of prescribing quality relates to the drugs categorised as 'less suitable for prescribing' in the BNF by the Joint Formulary Committee. Although such preparations may not be considered as drugs of first choice, their use may be justifiable in certain circumstances. (Appendix 3 gives a full list of these drugs).

In some instances no other prescription will be required or a cheaper alternative will be more appropriate, but this will not always be the case. For this reason we have included these drugs as indicators of the quality of prescribing rather than as indicators of potential cost savings. These drugs cost the Scottish NHS £15.5 million in 1998 (Exhibit 11). They differ from the list of limited value drugs covered in the next chapter, which generally offer direct savings since no alternative prescription is indicated in their place.

**Exhibit 11: 1998 prescriptions and costs of drugs the BNF classes as 'less suitable for prescribing'**

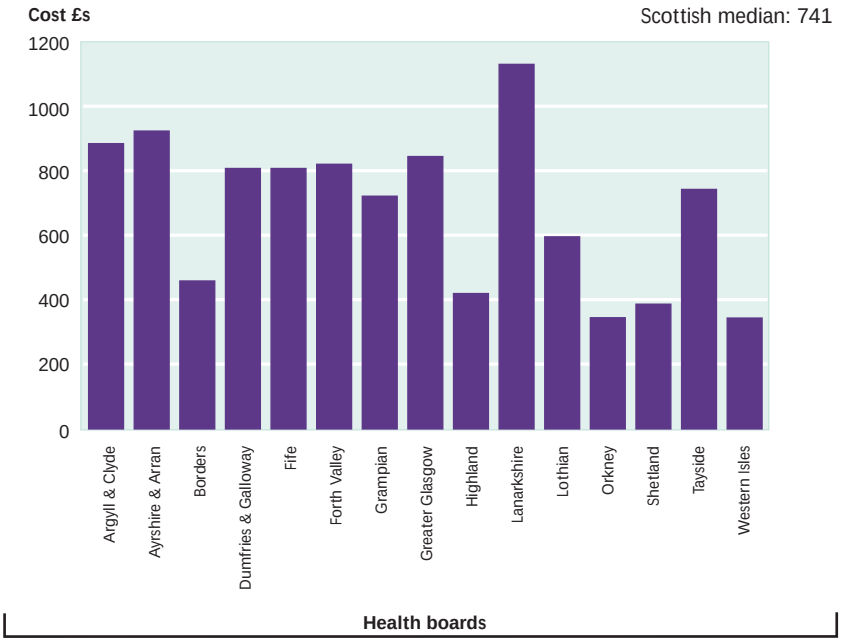
| Chapter description | Prescriptions | Expenditure | Cost per 1000 SCOTR PU |
|---|---|---|---|
| Gastro-intestinal system | 42,000 | £115,400 | £5.41 |
| Cardiovascular system | 136,200 | £1,094,000 | £51.34 |
| Respiratory system | 169,300 | £2,597,700 | £121.91 |
| Central nervous system | 3,530,200 | £10,770,300 | £505.11 |
| Infections | 2,500 | £21,300 | £1.00 |
| Endocrine system | 3,500 | £44,800 | £2.10 |
| Obstetrics, gynaecology, and urinary-tract disorders | 800 | £5,400 | £0.25 |
| Nutrition and blood | 194,800 | £186,500 | £8.75 |
| Musculoskeletal and joint diseases | 37,800 | £387,500 | £18.18 |
| Eye | 12,200 | £19,800 | £0.93 |
| Ear, nose and oropharynx | 115,600 | £273,900 | £12.83 |
| Skin | 7,100 | £28,400 | £1.33 |
| Other drugs and preparations | 16,900 | £2,700 | £0.13 |
| Totals | 4,268,900 | £15,547,700 | |

Drugs acting on the central nervous system account for over 60% of the total. The single most significant drug in this class is co-codamol, with over 1.3 million prescriptions annually costing more than £6.4 million. Within this figure there are half a million prescriptions, costing £2.7 million, for effervescent co-codamol which is the most expensive form of the drug. Co-codamol is an analgesic, a combination of paracetamol and a low dose of codeine. Although commonly used, the advantages over paracetamol alone have not been substantiated. Another analgesic coproxamol accounts for 479,988 scripts and costs £1.6 million. These two drugs alone account for over 50% of the cost of all 'less suitable for prescribing' drugs.

Other drugs include compound bronchodilators prescribed for respiratory diseases, with over 110,000 prescriptions costing £2 million, and a range of peripheral and cerebral vasodilators (used for dilation of the blood vessels, with over 100,000 prescriptions costing £1.5 million.) The BNF states: "Most compound bronchodilator preparations have no place in the management of patients with airways obstruction." Of the range of vasodilators included in the list, the BNF states they "are not established as being effective".

Within these overall figures, there is wide variation between health boards (Exhibit 12). While there will be occasions when there is good reason to prescribe one of these drugs, the levels of prescription should be monitored and reviewed regularly. This should improve the quality of prescribing and may also offer the potential for sizeable savings.

**Exhibit 12: Health board costs of BNF "less suitable for prescribing" drugs per 1000 SCOTR PUs in 1998**



# The cost agenda

## Introduction

Expenditure on drugs prescribed by GPs has been increasing faster than inflation. This is due to a range of factors, including increases in drug prices, changes in prescribing patterns, and the introduction of new drug treatments for conditions previously untreated. There are a number of conditions where further expenditure would be worthwhile, such as the use of ACE inhibitors and statins for cardiovascular diseases described in the Overview. These pressures increase the need to eliminate ineffective prescribing and promote the most cost effective alternatives.

The potential cost savings we have identified fall into several groups:

- optimising generic prescribing
- increasing therapeutic substitution
- reducing the use of premium priced preparations
- minimising the use of drugs of limited value
- reducing the prescription of drugs recognised as 'over prescribed'.

Each group is considered in turn.

## Generic prescribing

Once the patent on a drug has expired, other companies are able to bring out their own generic versions. But, because they bear none of the original research and development costs, they are often much cheaper.

There are some situations in which it is not appropriate to prescribe the generic equivalent instead of a branded drug. The exceptions apply where bioavailability is so important that a patient should always receive the same brand. For example, with certain treatments for epilepsy and some heart diseases it is best to specify drugs from a single manufacturer. However, in the overwhelming majority of cases it makes no difference to patients whether they receive a branded drug or its generic equivalent, offering scope for significant savings.

There has already been a major shift in the percentage of drugs prescribed generically, from 40% in 1992/93 to 67% in 1998/99. This has led some GPs and others to believe that there is little scope for further savings in this area. It is true that there are many drugs where further savings will be difficult to achieve, since the number of branded prescriptions is low and the cost difference between the branded drug and its generic equivalent is small. To avoid identifying a large number of small savings which would be difficult to achieve in practice, we concentrated on the 25 drugs with the greatest potential for saving. If 100% substitution was achieved, the potential savings would be about £5 million. Even if 50% substitutions was achieved, reflecting the problems in making changes in practice, savings to the NHS in Scotland would be £2.5 million.

It is important not to become complacent about savings from generic prescribing, since the potential changes all the time as new drugs come off patent. Ranitidine is an excellent example. Until recently there was no potential for saving, since no generic equivalent existed. Now the drug is off patent, and potential savings of about £0.75 million could be realised if all GPs prescribed the generic equivalent. Generic ranitidine was added to the drug tariff in November 1997 and its generic price has dropped progressively over the last 18 months. It is now less than half the price of the branded version.

The picture will continue to change: for example two of the SSRIs, fluoxetine and paroxetine, will soon come off patent, offering savings. In 1998 over £4 million was spent on these two drugs. Each year, particular drugs will have a generic equivalent for the first time, so there is a continuing need to monitor and review generic prescribing.

The variation in generic prescribing also indicates that there are further savings to be made. In some health boards average generic prescribing is over 70%, while in others it is 15%-20% less. The variation is even greater at practice level. The high level of generic prescribing achieved by many practices indicates the potential for others.

One way in which GPs can ensure that these new savings are achieved as soon as possible is to prescribe generically even when the branded drug is still on patent and not available in generic form. Patients can continue to receive the same prescription, and the pharmacist can then make the switch immediately when the generic equivalent does become available.

### Therapeutic substitution

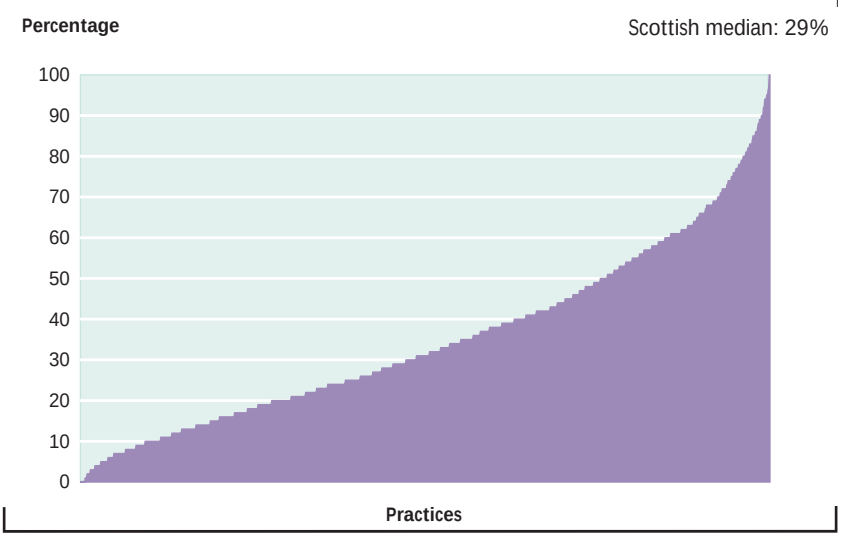
GPs are often faced with a choice between several drugs for a patient with a particular condition. Where the efficacy and safety of two drugs are equal, then the choice of drug should be made on the basis of cost. A list of drugs which can be substituted in this way has been identified from the BNF (Exhibit 13); if the lower-price version was prescribed in every case, then savings of £22 million could be achieved. There may be situations where, for a range of reasons, the GP believes that the higher-priced drug would be more effective for an individual patient. Achieving 50% substitution would lead to savings of £11 million.

**Exhibit 13: Examples of potential savings from substitution of similiar drugs**

| Drug | Consider substituting | Comment | Saving calculated at 50% substitution | Saving calculated at 100% substitution |
|---|---|---|---|---|
| Ranitidine/famotidine/nizatidine | Cimetidine | 'All H2-receptor antagonists heal gastric and duodenal ulcers.' 'Cimetidine should be avoided in patients stabilised on warfarin, phenytoin, and theophylline (or aminophylline), but other interactions may be of less critical relevance.' (BNF 37 Edn.) | £6,110,000 | £12,220,000 |
| Indapamide | Bendrofluazide | 'Other thiazides and related diuretics do not offer any significant advantage over those mentioned above [bendrofluazide and chlorthalidone] and the newer ones are more expensive than the longer-established thiazides.' 'Indapamide is claimed to lower blood pressure with less metabolic disturbance, particularly less aggravation of diabetes mellitus.' 'In the management of hypertension a low dose of a thiazide, eg bendrofluazide 2.5mg daily, produces a maximal or near-maximal blood pressure lowering effect, with very little biochemical disturbance. (BNF 37 Edn.) | £100,000 | £200,000 |
| Doxazosin/terazosin | Prazosin | 'Doxazosin and terazosin have properties similar to those of prazosin.' (BNF 37 Edn.). For each patient it is necessary to consider whether the benefits of once daily dosing offered by doxazosin or terazosin justify the extra cost. | £995,000 | £1,990,000 |
| Isosorbide mononitrate | Isosorbide dinitrate | 'The activity of isosorbide dinitrate may depend on the production of active metabolites, the most important of which is isosorbide mononitrate. Isosorbide mononitrate itself is also available for angina prophylaxis, though the advantages over isosorbide dinitrate have yet to be firmly established.' (BNF 37 Edn.) | £1,630,000 | £3,260,000 |
| Expensive NSAIDs such as fenbufen, azapropazone, etodolac, nabumetone, tenoxicam, meloxicam | Ibuprofen or Naproxen | 'Differences in anti-inflammatory activity between different NSAIDs are small, but there is considerable variation in individual patient tolerance and response. About 60% of patients will respond to any NSAID: of the others, those who do not respond to one may well respond to another.' 'The prescriber should weigh efficacy against possible side-effects.' 'Recent evidence on the relative safety of seven oral NSAIDs has indicated differences in the risks of serious upper gastro-intestinal side-effects. Azapropazone is associated with the highest risk and ibuprofen with the lowest.' (BNF 37 Edn.) The choice of available NSAIDs is wide; one of the cheaper preparations is likely to be suitable for most patients. | £1,320,000 | £2,640,000 |
| Minocycline | Oxytetracycline | 'Microbiologically, there is little to choose between the various tetracyclines, the only exception being minocycline which has a broader spectrum...but is no longer recommended because of side-effects including dizziness and vertigo.' (BNF 37 Edn.) In the oral treatment of acne either oxytetracycline or tetracycline is usually given with minocycline an alternative which offers less likelihood of bacterial resistance but may cause irreversible pigmentation. | £975,000 | £1,950,000 |
| Totals | | | £11,130,000 | £22,260,000 |

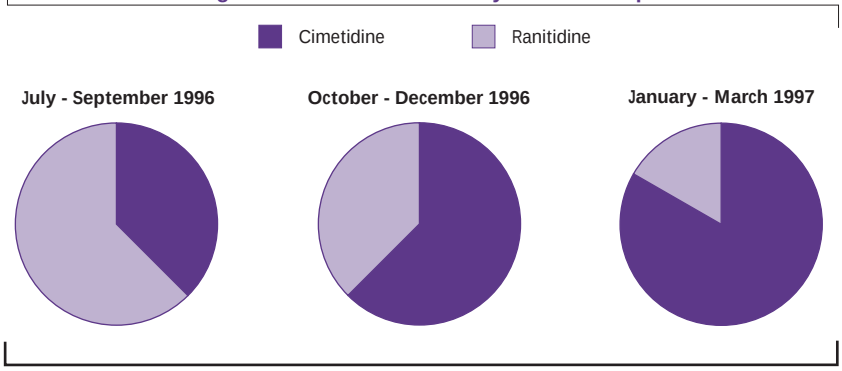
The variation in the percentage of therapeutic substitution used by practices is very marked. For example, the percentage of cimetidine as a percentage of all H2-receptor antagonists (ranitidine, famotidine and nizatidine) is fairly evenly spread from 0% to 100% (Exhibit 14). This indicates that there is considerable potential for cost reduction by substitution.

**Exhibit 14: Cimetidine as a percentage of all H2-receptor antagonists (based on DDDs in 1998)**




The three pie charts below highlight graphically the switch to cimetidine that one Lothian practice achieved in 9 months. The practice moved from prescribing 38% of cimetidine as a proportion of all cimetidine and ranitidine to 83% between July 1996 and March 1997.

**Exhibit 15: The change to cimetidine achieved by one Lothian practice in 9 months**



## Premium priced preparations

Some drugs are produced in both a standard and a premium price form. This section examines three types of premium priced preparation:

- **Modified (slow, sustained) release.** These formulations are designed so that the drug is released more slowly into the body. Typically the modified release provides a whole day's dose in one tablet. This eliminates the need to take several tablets during the day to achieve the desired dosage. Modified release versions are therefore more convenient, and may improve compliance. They are appropriate for some patients, but for others the benefits may not justify the extra costs.

- **Combination drugs** have similar benefits, combining two preparations in one tablet. They also save a double prescription charge for the minority of patients who pay prescription charges. However, like modified release drugs, they are often substantially more expensive than the standard form of the drugs. In addition, it may be better to prescribe separate drugs which offer more flexibility than a combination drug.

- **Inhaled drugs** are the third form of preparation we examine in this section. Premium price preparations use various devices to deliver the drug. These devices are sometimes easier to use, particularly for those patients with hand and breathing co-ordination problems, than those found in the less expensive preparations, and may provide a more reliable delivery of drugs to the lungs. However, they are expensive, and the counter view is that adults can achieve similar clinical benefits from less expensive inhalers as long as they are taught how to use them correctly. Larger spacer devices are an alternative for achieving the same result at a lower cost.

We have identified a selection of drugs that are often prescribed in expensive formulations, when less expensive standard formulations are available (Exhibit 16). Most of these were used by the Audit Commission in their report *'A prescription for improvement'*.

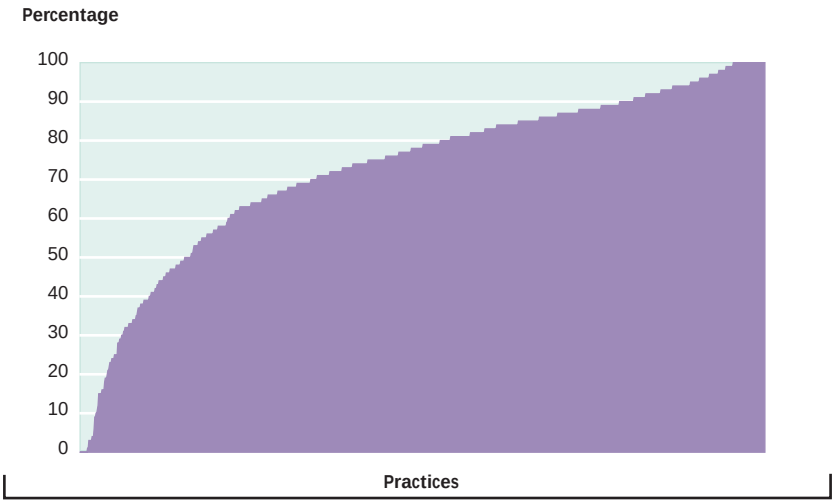
**Exhibit 16: Examples of potential savings from more appropriate use of premium price products**

| Drug | Expenditure | Savings at 50% | Savings at 100% |
|---|---|---|---|
| Modified Release | | | |
| Propranolol hydrochloride | £1,255,000 | £590,000 | £1,180,000 |
| Isosorbide mononitrate | £6,731,000 | £2,930,000 | £5,860,000 |
| Verapamil hydrochloride | £663,000 | £290,000 | £580,000 |
| Diclofenac sodium | £4,397,000 | £1,605,000 | £3,210,000 |
| Indomethacin | £301,000 | £125,000 | £250,000 |
| Ibuprofen | £300,000 | £125,000 | £ 250,000 |
| Combination products | | | |
| Co-amilofruse (amiloride HCl/frusemide) | £1,490,000 | £340,000 | £680,000 |
| Co-codamol (codeine phosphate & paracetamol) | £4,750,000 | £1,950,000 | £3,900,000 |
| Dry Powder Inhalers etc. | | | |
| Beclomethasone dipropionate; budesonide and fluticasone propionate | £7,980,000 | £1,510,000 | £3,020,000 |
| Salbutamol and salmeterol | £5,652,000 | £1,295,000 | £2,590,000 |
| Terbutaline | £2,001,000 | £665,000 | £1,330,000 |
| **Total** | **£35,520,000** | **£11,425,000** | **£22,850,000** |

Replacing 50% of premium-priced preparations with standard formulations would save around £11 million each year.

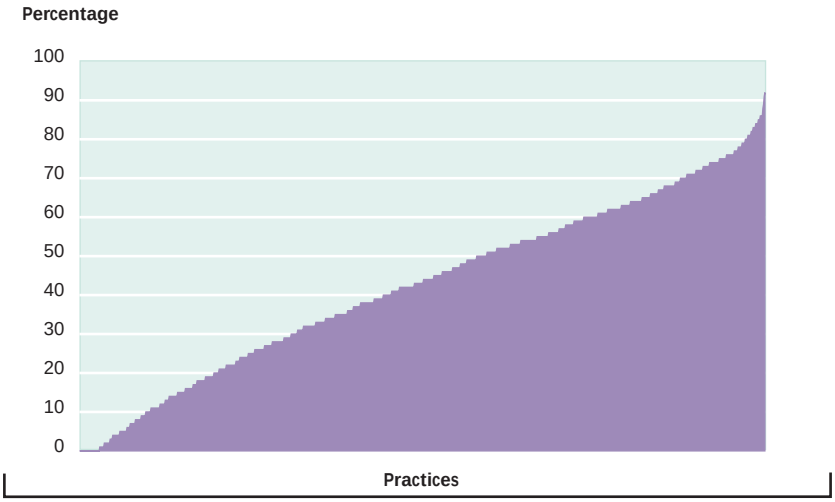
There is wide variation between practices. Exhibit 17 shows the variation in the use of modified release isosorbide mononitrate, with many practices using high percentages of the modified release form of the drug. This variation may be in part due to the influence of hospital prescribing as these drugs can be heavily discounted to the acute sector (see page 46).

**Exhibit 17: Isosorbide mononitrate modified release as a percentage of all isosorbide mononitrate (based on DDDs in 1998)**




The example of co-codamol again highlights the large variation between GP practices (Exhibit 18). This wide variation, combined with the high volume of co-codamol prescribed, suggests that a 50% reduction in prescriptions of the premium priced preparations is not unreasonable.

**Exhibit 18: Co-codamol as a percentage of co-codamol, paracetamol and codeine (based on DDDs in 1998)**




In addition to the premium-price drugs analysed in Exhibit 16 we also compared HRT and nitrate patches with the cost of providing the same drugs in tablet form. The reason why we have shown patches separately is because there is strong debate whether increased compliance and better side effect profiles justify the prescribing of patches. As Exhibit 19 shows, the difference in cost between patches and tablets is £4 million. Assuming a target of 50%, savings of about £2 million should be achievable.

**Exhibit 19: Examples of potential savings if patches were replaced by tablets**

| BNF | Patches | Replacement | Expenditure | Savings at 50% | Savings at 100% |
|---|---|---|---|---|---|
| 2.6.1 | Nitrate | Isosorbide dinitrate | £1,345, 000 | £565,000 | £1,130,000 |
| 6.4.1 | HRT (oestrogen only) | Oral Elleste Solo | £2,605,000 | £835,000 | £1,670,000 |
| 6.4.1 | HRT (oestrogen and progesterone) | Oral Elleste Duet | £1,757,000 | £565,000 | £1,130,000 |
| | Total | | £5,707,000 | £1,965,000 | £3,930,000 |

## Drugs of limited value

This list of 'limited value' drugs has some overlap with the BNF's list of 'drugs less suitable to prescribe'. However, the 'limited value' drugs list is made up of drugs which are generally considered to have little or no lasting therapeutic value for the majority of patients. Examples of medicines judged by the BNF to be of limited efficacy include topical NSAIDs. These drugs can generally be stopped without the need for an alternative to be prescribed in their place.

In spite of their limited value, these drugs are still prescribed in large numbers. Reducing these prescriptions offers the scope for cost savings without reducing the quality of care received by patients (Exhibit 20).

**Exhibit 20: Drugs of 'limited value'**

| BNF | Description | Items | Expenditure |
|---|---|---|---|
| 2.6.4 | Peripheral and cerebral vasodilators. 'Cinnarizine, oxpentifylline, prazosin and thymoxamine are not established as being effective.' BNF 37 edition | 55,000 | £973,000 |
| 10.3.2 | Topical NSAIDs 'Topical NSAIDs may provide some slight relief of pain in musculoskeletal conditions.' BNF 37 edition. | 457,000 | £2,963,000 |
| | Total | 512,000 | £3,936,000 |

The examples given above total £4 million. Even if only 50% of these prescriptions could be avoided, the potential savings to the NHS in Scotland total £2 million.

## Potential savings

Although each of the categories discussed above offers real scope for savings - the total from all categories is £58 million - there is some double counting. Isosorbide mononitrate modified release savings appear in both premium priced preparations and therapeutic substitution. The value of this double counting is £2.8 million. The other double counting is between therapeutic substitution and generic substitution where the value of the duplication is £1.9 million.

After allowing for this duplication, a cautious estimate of the total potential savings is £53 million. If 50% of these savings were achieved in practice this would release £26 million representing around 5% of the total GP prescribing expenditure in Scotland.

Some of these savings are relatively easy to make, but most mean that GPs need to spend time reviewing their prescribing and discussing changes with patients. It is impossible to achieve instant savings. However, the size of savings which are possible, and the growing demands on the drugs budget from effective new treatments, means that this work would be worthwhile.

Problems and opportunities in achieving these savings and improving the quality of prescribing are discussed in the following chapters. However, the final section of this chapter examines the issue of over-prescribing.

## Over-prescribed drugs

Over-prescribing occurs when a prescription is given but the drug is not necessary, or alternative non-drug treatments are preferable. A common example is the prescription of antibiotics for upper respiratory tract infections. Over-prescription is not only costly, it may also expose the patients to unnecessary side effects and increases the risk of the development of antibiotic resistance.

Identifying exact figures is impossible at a national level, but it is possible to derive estimates as we have done in this section. We have identified 'good' prescriber practices to use as a benchmark. As far as possible, we have ensured that these practices are not simply those with a patient population less likely to require high levels of prescribing. The criteria used are:

- average or above average percentage of patients over 65 years
- average or above average percentage of patients over 75 years
- above average on at least 50% of the quality indicators used in Section 2 which are appropriate to the five categories of over prescribed drugs reviewed (see Exhibit 21)
- below average prescribing costs for the group of over prescribed drugs.

One hundred and sixty five practices met these criteria.

The criteria do not make allowance for morbidity which can have a substantial impact on prescribing patterns. We therefore used a deprivation indicator (SIR 74)[11] to indicate the proportions of these practices with populations rated in the top, middle and bottom third of the deprivation range. Fifty six percent of practices come from the most affluent third of the SIR74 list, 27% from the middle third, and 17% from the most deprived third.

[11] SIR 74 Age-sex standardised self reported limiting long-term illness ratio of those under 75

Surprisingly, for our sample there is no significant difference between the average prescribing costs of the 56% of practices in the top third and the 17% in the bottom third. However, the average cost of all the top third SIR74 practices is 20% lower than the bottom third practices. This may suggest that while a few practices serving deprived populations can achieve the same costs as more affluent practices most, as expected, have higher than average prescribing costs.

These 'good' practices have been used as a benchmark to derive a broad estimate of the likely cost of over-prescribing across a selected group of drugs (Exhibit 21). Since there is no readily available measure of morbidity the results offer only a broad indication and should be used with caution; however, they do suggest that there is scope for improved effectiveness and cost savings through reducing over-prescribing. With local interpretation the more detailed figures provided to prescribing advisors should help to inform the local debate.

**Exhibit 21: Examples of drugs said to be significantly over prescribed**

| BNF | Drug section | Use/ indication | Comment | Expenditure | Potential saving if level of 'good practices' was achieved by all |
|---|---|---|---|---|---|
| 1.3 | Ulcer healing | Peptic ulcers, GORD | Drugs may sometimes be prescribed presumptively to alleviate symptoms of dyspepsia that may or may not be due to peptic ulceration. | £66.0 million | £16.2 million |
| 1.6 | Laxatives | Constipation | Misconceptions about bowel habits have led to excessive laxative use. Laxatives should generally be avoided except where straining will exacerbate a condition (such as angina) or increase the risk of rectal bleeding as in haemorrhoids. (BNF 37 edition) | £4.6 million | £0.7 million |
| 4.1 | Hypnotics | Insomnia | Before a hypnotic is prescribed the cause of the insomnia should be established and, where possible, underlying factors should be treated. Hypnotics should not be prescribed indiscriminately and routine prescribing is undesirable. They should be reserved for short courses in the acutely distressed. (BNF 37 edition) | £2.7 million | £1.1 million |
| 5.1 | Antibiotics | Infections | The Standing Medical Advisory Committee report *'The path of least resistance'* warns of the dangers of over prescribing and states 'GPs... continue to prescribe antibiotics, sometimes for inappropriate indications, in inappropriate doses, for inappropriate lengths of time.' | £17.9 million | £5.6 million |
| 10.1.1 | NSAIDs | Pain & inflammation in rheumatic disease | Before treatment is started the prescriber should weigh efficacy against possible side effects. In osteoarthritis or for soft-tissue lesions paracetamol should be used first and can often give adequate pain relief. BNF 37 edition. The Committee on the Safety of Medicines recommendations include that patients with a history of peptic ulcer and in the elderly NSAIDs should be given only after other forms of treatment have been carefully considered. | £18.1 million | £4.9 million |
| Total | | | | £109.3 million | £28.5 million |

# Repeat prescribing

A repeat prescription is where a further prescription for the same medication is issued at the patient's request without a face-to-face consultation. Managing repeat prescribing well is an important element in improving both the quality and the cost effectiveness of prescribing. Repeat prescriptions account for 75% of all items prescribed, and more than 80% of prescribing costs [12].

In the right circumstances, repeat prescriptions can be valuable. For patients who require long term treatment, which is unlikely to vary significantly in either the type of drug or the dosage, repeat prescriptions avoid the need for frequent visits to the GP practice, saving time for both patient and GP. However, this convenience needs to be balanced against the problems which may be associated with repeat prescribing. First, there is the risk that drug treatments may not be adequately reviewed as the patient's needs change. Second, there is a danger that new drugs are prescribed without doctor or patient being aware of the full range of drugs being taken. This increases the risk of adverse drug reactions and unintended combinations, which may either render the treatment less effective or pose risks to the patient. It may also be less cost effective.

Since repeat prescriptions are so common, practices need a system for managing them effectively. A study of repeat prescribing[13] identified the issues which the system should address (Exhibit 22); the same study found that many practices had inadequate controls, and that this was wasteful and potentially dangerous.

When patients who receive repeat prescriptions are due to consult their GP it may be valuable to allow extra time for these appointments. This allows time to review the patient's experience on the drug, and to consider whether the drug, its form or the dosage need to be changed. Patients on repeat prescriptions should have regular consultations with their GP.

Medication reviews offer a way of improving the management of repeat prescribing. A GP or pharmacist reviews all the medication which a patient is taking (prescription and non-prescription), with the aim of identifying any drugs or combinations of drugs which are no longer appropriate, or where a substitute or additional drugs would be appropriate. Reviews also offer the opportunity to establish whether the repeat prescribing system is working as planned.

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12 Harris CM and Dadja R, *'The scale of repeat prescribing'*, British Journal of General Practice, 1996, 46:640-1.

13 Zermansky AG, *'Who controls repeats?'*, British Journal of General Practice, 1996, 46: 643-47

Exhibit 22

### A model of repeat prescribing

Repeat prescribing involves three tasks:

**Production.** This is a straightforward task, usually delegated to a receptionist: it involves receiving requests and producing the prescriptions (usually on a computer).

**Management control.** This is generally the practice manager's responsibility. It comprises four elements:

- Authorisation check - ensuring that all repeats have been authorised by a doctor
- Compliance check - identifying patients who overuse or underuse their medication
- Review date - ensuring that every patient has a clear indicator of when therapy should be reviewed, and
- Flagging - ensuring that each patient due for review is brought to the prescriber's attention.

**Clinical control.** This is the doctor's responsibility. It involves two tasks:

- Authorisation - the decision that a repeat prescription is appropriate, the prescriber is satisfied that the drug is effective, well tolerated, and still needed.
- Periodic review - a review of the patient and the medication by the prescriber to ensure that the treatment is still effective, appropriate and well tolerated. The prescriber makes an informed decision as to whether medication should be continued, changed or stopped. This must involve either a consultation or some communication with the patient, since without this any evaluation of the effects of the drug can only be speculative.

Source: A.G. Zermansky *'Who Controls Repeats'*

The large number of patients who receive repeat prescriptions and the experience pharmacists have of drug interaction mean that medication review is an area of work where the pharmacist can make a valuable contribution to the quality of patient care and reduce the GP's workload. Experience from a number of pharmacist-led medication reviews confirms their value. Reviews should prioritise those patients who are taking a large number of different drugs or those most at risk from the adverse side effects of drugs.

### The Inverness & Culloden Health Care Co-operative repeat prescribing systems project

The objective of the study was to improve the quality and cost effectiveness of repeat prescribing within the Co-operative. A pharmacist worked with each practice towards an improved, more robustly controlled, repeat prescribing system. All 12 practices within the Co-operative took part, and a part-time pharmacist was employed.

The management of repeat prescribing in each practice was assessed by using the Zermansky model outlined in Exhibit 22. The results were summarised and discussed with the practice to identify areas of the repeat prescribing system which the practice would like to improve. The pharmacist was available to work with the practices to facilitate change. Approximately six months later, the pharmacist re-assessed the repeat prescribing system in each practice using the same method. Eleven out of twelve practices showed an improvement in the control of their repeat prescribing systems.

### Development of a review programme for repeat prescription medicines in Lothian

This project was developed to help introduce a repeat prescribing review programme in general practice. It was introduced by the Lothian pharmacist facilitator into ten GP practices (56 GPs) between March 1994 and February 1995. Approximately 25 patients, each receiving six or more prescription items, were selected from each practice. Details of the patients' medication were reviewed by the pharmacist facilitator, who then recommended changes at a review meeting with the GPs. The recommendations fell into four groups:

- stop the drug
- change the drug
- change the dose
- change the preparation.

If medication changes were necessary for a particular patient, this was entered on the repeat prescription form and the patient was invited to attend a consultation with their GP. The changes made were recorded and passed to the pharmacist. The results were fed back to the GPs at a second review meeting six months later.

The project was complicated by difficulties in getting an accurate record of patients' repeat medication. Most GP prescribing systems were not tightly controlled, and records were often out of date.

The pharmacist reviewed 1,301 prescription items and recommended that 370 (28%) should be changed. A change in prescription items was made in 255 cases (20%).

Nine practices comprising 46 GPs completed the project, and 83% of them said that they would like the programme to be provided on a regular basis. Although it was time-consuming for both pharmacist and GPs, the benefits to the patients include a regular review of their medication, and an opportunity to discuss their treatment. Changes made to medication may lead to more appropriate drug use, and less wastage by stopping unnecessary therapy.

### Pharmacist medication review in a GP surgery, Argyll & Clyde

This project was designed to examine the way repeat prescribing worked, and to examine the benefits of a pharmacist working in the surgery. The surgery's computer system was used to select those patients aged between 45 and 65 who were being prescribed four or more drugs. One hundred patients were identified and invited to a medication review clinic; 70 attended.

At the clinic the pharmacist reviewed each patient's medication (prescribed and OTC) using a standard profile, and identified changes for recommendation to the GP. If the GP and the patient both agreed, a new prescription form was issued and discontinued drugs deleted, and the patient's notes were updated with a summary of the changes.

All patients who attended the clinic rated it as either 'good' or 'excellent'. The clinic provided an opportunity to educate patients, particularly those (17%) who did not know why their treatment had been prescribed. The number of drugs prescribed was reduced from an average of 8.5 per patient to 8.0, and a large number of substitutions were made. In total 342 recommendations were made to GPs (an average of 4.9 per patient), of which 307 (90%) were accepted. In addition to quality improvements, the net cost saving was approximately £9.20 per patient per month, a total of more than £7500 annually.

**Pharmaceutical Care Planning in Primary Care in a practice in Tayside**

This project was designed to document and evaluate the delivery of pharmaceutical care through joint community pharmacist and GP activity. 87 patients in a small rural practice in Dunkeld were involved in the study. The pharmacist worked in the practice and in the pharmacy.
Four stages were followed:

- Review of medical and pharmacist's patient medical records (PMR) to identify actual and theoretical care issues.
- A structured interview with the patient.
- A meeting with the GP to finalise the plan.
- Regular reviews to check progress.

An expert panel of one hospital and one primary care clinical pharmacist and a GP in academia, formed part of the quality assurance system of the project. The panel reviewed the first thirty-five care plans and undertook an independent assessment of care issues.

**Evaluation/Outcome**

| Care Issues | Number | (%) |
|---|---|---|
| Adverse drug reaction | 153 | (34%) |
| Drug interaction | 25 | (6%) |
| Drug or dose selection | 97 | (20%) |
| Compliance/concordance | 33 | (7%) |
| Indications | 53 | (12%) |
| Monitoring issues | 66 | (14%) |
| Duration of therapy | 33 | (7%) |
| Totals | 460 | |

460 care issues were identified in 87 patients. 47% of the issues were identifiable from the community pharmacist's PMR alone, and a further 21% were identifiable after discussion with the patient. The expert panel reviews were consistent and in agreement with issues identified by the community pharmacist. This demonstrates that there is scope for community pharmacists to improve patient care. It should be noted, however, that almost one-third of care issues could only be identified from information held by the GP.

These and other studies confirm that repeat prescribing controls need to be improved, and that medication review can improve the quality of prescribing.

# Supporting effective prescribing

The previous sections have looked at both the quality and the cost of prescribing, using a range of indicators. They have shown how quality and cost effectiveness have improved over recent years, and identified areas where further improvements are possible.

The Management Executive's Planning and Priorities Guidance 1999-2002[14] states: "PCTs will also wish to ensure that full advantage is taken of the opportunities presented by unified budgets by promoting cost effective prescribing. Support should be given to GPs to improve clinical practice through the provision of comparative information, access to pharmaceutical advice, the development of protocols between primary and secondary care and arrangements for reviewing repeat prescribing."

This chapter examines how PCTs, LHCCs and others can help to support continued improvements. It looks first at direct support to GPs, and then at broader initiatives at PCT and health board level.

## Support for GPs

GPs currently have, and will retain (with the exception of nurse and dental prescribing and changes that may flow from The Crown Report[15]), the main responsibility for deciding whether a prescription should be issued or not and the choice of drug, dose and quantities provided. It is they who determine the quality and cost effectiveness of primary care prescribing. However, much can be done to provide appropriate support to assist GPs in achieving high quality cost-effective prescribing.

There has been increasing recognition over recent years of how useful support can be, and a good deal has been done in this area. The last decade has seen the introduction of the indicative prescribing scheme, and the appointment of Medical Prescribing Advisors (MPAs) and Pharmaceutical Prescribing Advisors (PPAs). Also in the nineties the Prescription Pricing Division (PPD) of the Common Services Agency has developed different forms of prescribing analysis, in particular Scottish Prescribing Analysis (SPA), Prescribing Information System for Scotland (PRISMS), and PRISMS for practices. Other central services include Pharmatrac, a drug information service, and the Scottish Medicines Resource Centre (SMeRC), which was established to promote appropriate safe, effective and economical prescribing. Responsibility for central data analysis including the provision of SPA data and PRISMS to health boards and PCTs has recently been moved from PPD to the new ISD Primary Care Information Unit.

As central data analysis has been developed it has helped prescribing advisors to monitor performance and to identify areas where quality and cost effectiveness could be improved. The provision of robust, independent evaluation and resource material by organisations like SMeRC and SHPIC is also greatly valued by prescribing advisors.

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[14] Management Executive *'Planning and Priorities Guidance For The NHS In Scotland 1999 - 2002'*, MEL (1998) 63.

[15] *The Crown Report*, *'Review of Prescribing, Supply & Adminstration of Medicines'*, March 1999.

## Prescribing advisors

The role of prescribing advisors varies a good deal across Scotland, but they are commonly involved in:

- analysing prescribing data
- providing prescribing information to practices
- providing prescribing advice and education to GPs and pharmacists
- visiting practices to promote rational prescribing
- encouraging good communication between GPs and community pharmacists
- developing and implementing guidance on prescribing
- setting and agreeing prescribing budgets
- influencing the prescribing interface between hospital and primary care
- developing formularies
- promoting prescribing audit
- encouraging and developing projects to improve GP prescribing.

The main difference between medical and pharmacist prescribing advisors is the training and experience they bring to the job. The PPA is a pharmacist and is knowledgeable about drugs, formulations and drug information sources. The MPA is a doctor, usually with GP experience, and brings to the role a knowledge of GP practices, including the practicalities of diagnosis and prescribing. There are areas of overlap, but there are also potential advantages from having a team which includes both.

Evidence suggests that information from a central source without local interpretation has little effect on GP prescribing[16]. Prescribing advisors can provide expert advice in interpreting that information in the light of local circumstances and identifying areas where quality and cost effectiveness could be improved.

Variations in job content, the size of the PCT, and the other types of prescribing support available are some of the factors which will have an impact on the number of advisors required, but there is marked variation in the level of advisory resource provided in different areas. Some of the differences are quite fundamental. For example, not all health board areas employ an MPA (at either health board or PCT level). At a time when GP prescribing and communication with and support to GPs is more important than ever, trusts and boards need to satisfy themselves that the arrangements for support provide both the appropriate level of advisor support and the most appropriate mix of advisors.

The highest standards of rational prescribing must be the aim. To function effectively the prescribing advisors team must be clear about the respective responsibilities of each member of the team. And appropriate support in terms of both administrative help and information technology must be provided.

## Specific support to practices

Health board or PCT prescribing advisors can work with practices to identify areas where prescribing could be improved, and provide advice on action that needs to be taken. However there is a limit to how much direct support they can provide.

There are a number of ways in which prescribing can be improved. GPs acting independently can achieve a great deal, for example by reviewing prescribing for specific conditions to ensure quality is as high as possible, or focusing on more generic prescribing as a way of reducing costs. The vast majority of practice-

[16] O'Connell DL, Henry D, Tomlins R. *'Randomised controlled trial of the effect of feedback on general practioners' prescribing in Australia'*. BMJ 1999; 318:507

level initiatives are undertaken without any additional funding, and the resulting lack of formal evaluation means that few GP-driven projects are highlighted in this section of the report.

In many instances the provision of support to practices is an effective way of improving both the quality and the cost of prescribing. The problem of finding prescribing support for GP practices has started to be addressed in recent years. Some GP practices have paid for their own prescribing support, normally a practice pharmacist. Health boards have also started providing GP practices and LHCCs with pharmacist support, either through the use of directly employed practice pharmacists or by using the services of community pharmacists on a sessional basis.

The variation in the level of support is enormous. At one end of the spectrum pharmacists are being employed full time to work in one or two GP practices. At the other end of the spectrum pharmacists are employed to visit individual practices for an hour every couple of months. In addition there are many practices that are not involved in any projects and so receive no direct pharmacist support.

There are many reasons for the high level of variation. The use of pharmacists to support GPs is relatively new and there is an understandable desire to test the approaches on a small number of practices before moving to full-scale provision. In several boards the programmes do not have funding beyond either pilot funding or Prescribing Management Scheme funding.

Few projects have been evaluated in detail because of the voluntary nature of the projects: it is likely that those who volunteer to take part in any particular project are more motivated, or believe it is an area where their practice can gain benefits. However, it is clear that the majority have been beneficial to the GP practices concerned. A small number have been reviewed to identify the main benefits, disadvantages and costs. Some of these are highlighted overleaf.

### A strategy for the management of upper gastro-intestinal disease, using a pharmacist managed clinic within Princes Street Surgery, Tayside

***Aims and objectives***

To establish a strategy for the management of upper GI disorders within the surgery and to ensure that all repeat prescribing of ulcer healing medicines is rational and cost-effective. The objectives were to (1) design and apply an educational forum, facilitated by a pharmacist, for the GPs on upper GI disease guidelines; (2) establish and apply a practice protocol and monitoring system for the management of upper GI disorders; (3) create and implement a pharmacist managed clinic for upper GI disorders, in accordance with guidelines agreed by the GPs; and (4) make an economic assessment and identify the benefits of a practice strategy for the management of upper GI disorders.

***Approach***

The study team comprised the practice pharmacist and GPs. A list of patients was obtained from the repeat prescribing system of all those on certain ulcer healing medicines in the last six months. A total of 795 patients were identified for the study. The patients' case notes were reviewed, data collection sheet completed and recommendations made in view of the information collected. A pharmacist led clinic and patient information leaflet were established, and appropriate patients attended a weekly clinic. With the patient's consent, their case notes and repeat dispensing file were altered.

***Evaluation/outcome(s)***

Patients were identified suitable for change dependent on GI disease diagnosis ie, eradication, dose reduction, stop treatment, NSAID review, prophylaxis continuation or change in treatment. Cost savings for the year were estimated at £48,800. The practice protocol allowed all members of the team to participate, encouraging ownership and continuity regarding prescribing and advice given to patients. The protocol was reviewed after three months, with little alteration required. This project has established a systematic approach to GI disorders in a general medical practice.

### Community pharmacists' review of patients medication in Lothian

***Aims and objectives***

To introduce a community pharmacy based review of individual patients' medication, following a scheme whereby patients are invited to bring all their medications from home to the pharmacy for review. The objective of the scheme was to create an opportunity for the pharmacists to identify drug-related problems and provide patient information.

***Approach***

Ten community pharmacists were each asked to recruit ten patients to the study over a three month period. Prior to the study, the pharmacists were given three training sessions and an option to identify patients directly themselves or seek referrals from GPs or practice nurses. Patients' interviews were semi-structured using standard documentation. A list of medicines, problems identified, action taken and outcome of the action were recorded for each patient.

***Evaluation/outcome(s)***

The study recruited 93 patients. A total of 624 prescribed medicines were reviewed, and a further 48 over-the-counter medicines were presented by 28 (30%) of patients. The pharmacists recorded at least one medication problem in 86 (92%) of patients. The pharmacists documented 458 responses from a total of 471 problems. Reinforcement was required for 56% of patients, clarification was required for 66% of patients, corrective action was undertaken by the pharmacist in 27% of patients, and follow up with the prescriber was required in 49% of patients. There was a tendency for patients selected for the study to be older people with polypharmacy, and therefore more likely to have problems with medicines. The high incidence of problem detection and action by the pharmacists demonstrates a need for regular pharmacy medication review.

One medication review study in Glasgow did make use of a randomised, controlled trial. An outline of this study and its findings are given in the case study below.

**Repeat prescribing in general practice: outcome of a randomised controlled trial of medication review, Professor Clare Mackie, Professor David Lawson, Alison Campbell, Alistair MacLaren and Professor R Waigh**

***Aims and objectives***

To improve the quality of prescribing and address the increase in drug expenditure arising from inappropriate or unnecessary repeat prescribing by: setting standards for repeat prescribing; and establishing a pharmacist directed medication review clinic.

***Approach***

The study population was all patients on four or more repeat medicines (3,344, 13%) from six randomly selected GP practices in Glasgow. 1948 patients (59%) were included in the study, 1677 patients in a randomised controlled trial (RCT) and in addition 271 elderly people in care were reviewed.

The medication review clinic was set up by community pharmacists to examine the following: (1) an indication for each drug with no unnecessary duplication; (2) an untreated indication which may require therapy; (3) an appropriate choice of therapy for each indication; (4) drug interactions and contra-indications; (5) an appropriate dose and dosing schedule; (6) suitability of formulation; (7) patient understands and is able to comply; (8) evidence for monitoring for efficacy and side-effects; (9) evidence of clinical review that therapy is still required; and (10) that compliance with instructions avoids therapeutic failure/toxicity. Medical records were received and patient interviews conducted for all patients however, recommendations for those in the control group were not forwarded to the GP. After approximately one year the notes were reviewed to follow up clinical outcomes.

***Evaluation/Outcome(s)***

1394 patients were referred, with a median referral rate of 83% (range 63-94%). In the active group, 2064 care issues were referred (an average of 2.8 per patient), and 1825 care issues were recorded in the control group (an average of 2.8 per patient). The outcome of the active referrals was that 1736 (84%) were agreed and 233 (11%) were partially agreed. The outcome after one year for the active group was that there were 264 (13%) care issues remaining. Within the control group there were 1198 (66%) care issues remaining after one year. For both groups about 35% were administrative issues and 65% were clinical issues. The top five clinical issues were as follows: unnecessary therapy (24%), ineffective therapy (12%), no routine monitoring (11%), inappropriate choice of therapy/dosing schedule (11%), and admitted non-compliance (11%). In addition, 271 elderly in care patients were reviewed out with the RCT (non-control group). 239 (88%) were GP referrals, with 922 care issues (average 3.4 per patient). An economic analysis was conducted, with the drug costs based on the actual costs over 12 months. The savings per patient were £29. The estimated cost of the clinics was approximately £40,000. The actual cost savings on drugs was £56,675. The health gain consequences of the study were improved disease management and avoidance of ADR's. There was a low rejection rate of issues (3%). In conclusion, medication review by a pharmacist can make a significant contribution to outcomes, with the challenge being to transfer this model of medicines management into the community. The study was funded by the primary care development fund.

The final case study is an example of a project conducted on a large scale.

**Primary Care Pharmacists in Tayside (PCPIT) Project**

***Aims and Objectives***

To improve the pharmaceutical care to patients in general medical practices in Tayside through improved quality and cost-effectiveness of prescribing.

***Approach***

Individual or one-off projects with enthusiastic pharmacists in motivated practices have demonstrated the potential to improve patient care in primary care. This project aimed to demonstrate that these benefits could be rolled out across an area, and were the result of the clinical knowledge and skills in relation to drug therapy that pharmacists can bring to the practice team.

Eleven pharmacists began work in June 1997 in seventeen practices. At present sixteen pharmacists work in thirty-three practices covering over 50% of the Tayside population. The pharmacists are integral members of the Primary Healthcare Team in their practices but they also form a close network which meets regularly to address education and training needs, provide peer clinical support and develop practice. The network is co-ordinated centrally to ensure a common focus, and to enable high quality standards of practice to be delivered.

***Evaluation/Outcome***

The work is being externally evaluated by St. Andrew's University but internal evaluation to date has demonstrated significant clinical and financial benefits. In terms of the quality agenda, of nine indicators used by the Accounts Commission, Tayside practices performed as well or better in six of the nine indicators. In practices with a practice pharmacist, this figure was eight out of nine.

In financial terms, potential cost savings in five groups are identified by the Accounts Commission. Comparisons with the Scottish median were not available and thus practices in Tayside with a practice pharmacist were compared with other practices in the Health Board. Where data were available, practices with a practice pharmacist consistently performed as well, or better, than other practices.

The role of the practice pharmacists, however, is not to address specific markers, but to develop with the practices, systems and procedures to ensure high quality care for patients. To date, cost savings have resulted from improved prescribing, but this is not the thrust of the work.

A specific project to ensure appropriate prescribing of proton pump inhibitors resulted in a 38% reduction in cost per patient against a 6% reduction in other practices. Future work will further develop joint working between practice and community pharmacists to maximise pharmacist resource.

The results of these reviews and others[17, 18, 19] together with those case studies in the repeat prescribing section of this report, give a clear indication of the value of using practice and community pharmacists. The report *'Clinical Pharmacy Practice in Primary Care'* [20] is devoted to statements of good practice on clinical pharmacy for pharmacists based in primary care. The guidance in the report is not repeated here, but it contains useful recommendations.

The two main constraints are the availability of pharmacists and finance. Even if every health board or PCT could afford the level of input being provided at thirty-three practices in Tayside, ie an average of one full-time pharmacist between two GP practices, it is extremely doubtful that there are enough pharmacists to provide such a level of service throughout Scotland.

The cost effectiveness of the service being provided also needs to be considered. For example, there is little doubt that the Tayside practice pharmacists have proved effective support to GPs and they are to be commended. However, it is unclear whether this level of input would be required on an on going basis, or whether spreading the practice pharmacists more thinly might produce a more equitable and cost effective practice pharmacist service. At the other end of the scale, a small project may cost a disproportionate amount to establish and administer relative to the benefit gained from the project.

To decide on the most appropriate level of support, a number of key questions must be addressed:

- What areas could be improved (quality and cost)?
- What are the objectives of providing support?
- What is the most appropriate way to achieve the improvement? (eg GPs with limited prescribing advisor support, GPs working on their own, GPs with pharmacist support, pharmacist with GP support.)
- What type of service can be provided within the resources available?
- How will this support be evaluated?

(A more detailed list of questions is provided at Appendix 4).

A related question is how best to provide pharmacist support. Policies covering a number of years are needed to encourage pharmacists to undertake additional training, and alter their methods and hours of working, to accommodate the new approaches being proposed.

There can be practical problems in involving community pharmacists in GP practices, since there is a legal requirement for the pharmacist to be in the pharmacy when a prescription is dispensed. This suggests that there may be considerable advantages in enabling community pharmacists to provide pharmacy support while working on their own premises.

This would allow community pharmacists to maximise their day by, for example, providing medication reviews in the pharmacy. There may also be potential to shift dispensing and checking responsibility to trained dispensing technicians. If pharmacists are to undertake this type of work in the pharmacy then they need access to patient records. This would be most effectively provided by computer links (see page 41).

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17 Hamley JH, MacGregor SH, Dunbar JA, Cromarty JA,*'Integrating clinical pharmacists into the Primary Health Care Team'*. Sct Med J' 1997, 42:004-007.

18 MacGregor SH, Hamley JH, Dunbar JA, Dodd TRP, Cromarty JA,*'Evaluation of a primary care anticoagulant clinic managed by a pharmacist'*. BMJ, 1996, 312:560.

19 NHS Executive, National Prescribing Centre, *'GP Prescribing Support: a resource document and guide for the New NHS'*, 1998.

20 Clinical Resource and Audit Group, '*Clinical Pharmacy Practice in Primary Care',* February 1999.

The introduction of unified budgets means that in theory funding for prescribing support could come from switching funds from anywhere else in the trust. A more acceptable way to fund GP prescribing support might be to make it at least partly self financing in the early years. A well-planned prescribing programme should be able to make significant improvements in quality and result in net savings after the costs of the support have been deducted. If this is how support is to be funded it should be built into the objectives of the study at the feasibility planning stage.

### Training of pharmacists

For pharmacists to support prescribing and to contribute fully to the effective functioning of multi-professional primary healthcare teams, a number of criteria must be met:

- GPs must want input from pharmacists.
- Pharmacists must be willing to be involved.
- GPs must be content with the pharmacist working with them and the type of work they are undertaking.
- The PCT must be sure the use of pharmacists in the way proposed is the most cost effective way to provide support.
- The pharmacists must receive appropriate training to undertake the planned duties.
- Patients must accept the new role of the pharmacist and trust them as they do their GP.

Currently pharmacists are recruited from a range of different backgrounds and there is a general view across Scotland that this will remain appropriate. However, if community pharmacists are to provide prescribing support there is a strong argument for more formal training for the role. The training available ranges from specific task-orientated training with no formal recognition outside the particular health board, through more comprehensive training still with little recognition, to training providing additional qualifications and links with the recognised post graduate qualifications.

The various clinical pharmacy training schemes currently being provided with health board funding should be reviewed to assess if they provide the best training for the provision of high standards of prescribing and for the integrated post graduate training for pharmacists.

### Information to support prescribing

GPs receive vast amounts of information from a variety of sources. If information is to affect patient care it must be accurate, relevant, and acted upon by the GP. It is therefore important that prescribing information is focused. Prescribing advisors produce short focused newsletters and other information on issues such as:

- new drugs
- incentive schemes
- comparisons of the costs of similar commonly used drugs
- the effectiveness of certain drug treatments
- guidelines on safe prescribing of specific drugs
- where drugs fit in to the treatment of particular conditions
- repeat prescribing.

In addition prescribing advisors provide analysis of SPA and PRISMS data. The information needed to support effective prescribing is complex and needs to be interpreted in the light of knowledge about local circumstances. Prescribing advisors have a good knowledge of the practices in their area and undertake analysis which allows monitoring of both the quality and cost of prescribing. However, prescribing advisors do not currently have access to the type of data we have used in this report, adjusted for population mix (SCOTR PU) and dosage (DDD).

The provision of accurate DDD information is dependent on consistent coding. Currently there is a lack of consistency in the coding of some fields. There are therefore two short term issues which need to be addressed: the development of information to provide DDDs and SCOTR PUs, and quality assurance to ensure that the data is accurate.

Even the use of DDDs and SCOTR PUs analysis has limitations. GPs and their advisors need to be able to link the drug prescribed to patient information such as age and diagnosis. This will allow much more accurate identification of where problems may exist and how they can be overcome.

In the medium term more sophisticated information systems are needed so that the many advantages of computerisation can be realised. A number of the main requirements and advantages are highlighted below.

**Practice level**: Practices can gain significant benefits by using the computer in the surgery to offer different prescribing options, taking account of formulary compliance or generic prescribing in the options selected.

The computer can aid diagnosis by providing a library facility which is programmed to provide information based on key words, and can provide up-to-date information on drugs and their appropriateness for given circumstances. It can store all patient information and produce prescriptions, offering the possibility of linking diagnosis, prescription and patient symptoms. This is potentially of great benefit to research and clinical audit. It would also allow the question of over and under prescribing to be addressed much more accurately than is possible at present.

**Community pharmacists networked to practices**: If community pharmacists are to work more closely with GP practices then there are benefits to be gained from networking practices with community pharmacists. As discussed earlier if pharmacists are to carry out medication reviews from their own premises they need to have access to the relevant patient information. This could be done by linking the community pharmacist to the GP practice computer system with necessary controls built in to safeguard patient records, in line with the Caldicott recommendations.[21,22]

The networking of pharmacists and GP practices would also be a step towards totally electronic prescribing. This would allow a record to be maintained of drugs prescribed and drugs dispensed. Currently we only have large-scale access to the records of drugs dispensed.

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[21] Caldicott Committee's Report on the Review of Patient - Identifiable Information, 1997.

[22] Scottish Office Department of Health: *'Protecting and using patient information; A manual for Caldicott guardians'*, 1999.

**Linking prescribing and dispensing with patient details and a unique patient identifier:** All prescriptions now carry provision for a patient identifier (CHI) which allows the linking of prescription, drugs dispensed, and other information such as patient age and sex, but completion of the CHI is not mandatory. The linking of these different items of information will greatly improve monitoring and clinical audit; up until now such linkage has not been possible.

**Computerisation at PPD and ISD:** PPD, and now ISD, have developed central data analyses which are valued by prescribing advisors and GPs. However, the further development of this service has until now been hampered by the IT systems. With the introduction of new systems and the reorganisation of service delivery, ISD should soon be in a position to develop improved analysis in consultation with users of the information.

In the short term there is a need to develop the analysis of existing information, but the real benefits will flow from achieving links between the prescription, what is dispensed, and the patient.

**Training and use:** While the technology is available to achieve all of these benefits there is little to be gained if it is not used. Everyone involved, including GPs, pharmacists and those responsible for coding information, needs to be committed to the new systems, and to receive the necessary training to ensure the system delivers the benefits expected.

Computerisation is not cheap and not all GPs will quickly convert to using a computer in their surgery. However, many are already making use of computers in consultations and for writing prescriptions. A process underpinned by the new GPASS system. If an integrated system is to be developed that delivers the benefits outlined above then it is essential that it is planned as part of an overall strategy.

## Budgets

Prescribing advisors have considerable experience in setting and agreeing practice prescribing budgets. This experience includes moving from historic budgets to formulas with a significant element of the budget determined on a weighted capitation basis. A specific weighted capitation formula is used to determine the health boards' allocations, but the same formula cannot be directly applied to produce practice budgets, since some elements are statistically unsound for populations as small as GP practices. Work is continuing and this may be possible at some point in the future. The recently published '*Arbuthnott Report*'[23] recommends a revised capitation formula for the allocation of the GP prescribing budget to health boards (see Appendix 1).

The relationship between prescribing advisors and finance directors in the PCTs is clearly important. The finance director is responsible for the unified budget and therefore must be satisfied with the process for budget setting, controls and monitoring but GP involvement and ownership are equally important. There is no reason why identical budget setting methods should be used by all trusts; however there would be advantages in PCTs sharing their methods so that good practice can be identified and shared.

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[23] The National Review of Resource Allocations for the NHS in Scotland; Professor Sir John Arbuthnott; *'Fair Shares For All'*; 1999.

In 1998/99 health boards' arrangements for setting prescribing budgets were transparent. This is an important feature of budget setting and is important if GPs are to have confidence in the system. At both PCT and LHCC levels, prescribing budgets should be:

- agreed with GPs
- based increasingly on accurate weighted capitation
- monitored against expenditure on a timely basis.

There also needs to be a clear understanding of how corrective action can be taken to bring spend into line with budget , and of how and when budget variations will be made.

Unified budgets provide an opportunity to make more effective use of resources by allowing resources to be switched between different types of health care. At the same time, however, they heighten the importance of good budgetary control which is understood by all involved.

## Targeted financial incentives

The majority of health boards ran targeted incentive schemes in 1998/99. The schemes were designed to improve the quality or reduce the cost of prescribing. The types of targets used in the incentive scheme include generic prescribing levels, formulary compliance, formulary development and agreed practice projects designed to improve the quality of practice prescribing for a particular condition eg asthma. Most schemes have both cost and quality targets and are based on the practice achieving an accepted standard.

### Lothian Health

This Rational Prescribing Payment Scheme was open to all non-fundholding practices in Lothian. The scheme consisted of three prescribing targets:

- the practice must achieve a set generic prescribing rate
- the practice must be within budget at the end of the financial year
- the practice must complete a practice-specific quality prescribing project.

A maximum payment of £1,000 per full-time GP could be achieved if the practice met all three targets. If less than three targets were met, then payments could be claimed at £333 per general practitioner for each target met. Payments were made to the practice (not the GP) for the purpose of improving patient care, purchasing equipment or undertaking projects approved by Lothian Health. The MPA visited those practices wishing to enter the scheme, in order to discuss and agree the targets.

Seventy five percent of eligible practices took part: 99% of the practices within the scheme achieved one or more targets; and 42% of practices achieved all three. The easiest target to meet was that of the generic prescribing target; achieved by 97% of practices and resulting in savings of £402,000 on the top 50 generic drugs prescribed.

For target three, most practices chose to undertake a prescribing audit on a specific issue of their choice. Some practices focused on a particular area to try to reduce their costs, and hence help achieve their prescribing budget target. Other practices chose to examine their standard of quality in prescribing.

Overall the scheme saved money, with the participating practices finishing with an overall underspend of £350,000 on their prescribing budgets compared with an overall overspend for all Lothian practices. It also resulted in 33 prescribing audits and 12 quality standards being produced.

In total, the practices received payments of £196,000 for reaching their targets.

Most incentive schemes are similar in that they are based on a package of quality and economy targets, and they involve modest payments to improve the practice rather than payments to the GPs themselves. Not all health boards offer schemes of this type, and some GPs question the professionalism of offering incentives to achieve standards which they believe they should be doing their best to achieve.

Although the financial value of incentive schemes is relatively small, most eligible practices commonly take part, and a high percentage achieve the targets set and receive the incentive payment. This suggests that, assuming the objectives of the incentive scheme are well thought out and the targets are achievable, measurable and relevant, then the schemes can make a noticeable improvement to prescribing standards.

In the past incentive schemes have operated at practice level, but LHCCs may provide a focus in future. It is important that their success is monitored.

### *Strategies and plans*

Historically there has been significant variation between health boards in the development of strategies and plans for GP prescribing. Reports to the board itself have commonly covered financial issues or specific new drugs. Strategies and plans have often been left to prescribing advisors, and sometimes consituted no more than informal plans without clear targets against which to measure progress. There are health boards, however, with clear strategies and action plans containing measurable objectives and targets. These are used to produce detailed personal objectives for staff, which are monitored on a regular basis.

The creation of PCTs and single stream funding has heightened the profile of GP prescribing, offering opportunities to reinvest savings, but also the risk that overspends will need to be accommodated by reductions elsewhere. At the same time, the development of evidence based healthcare has increased the need to demonstrate relative costs and benefits, while clinical governance has placed a premium on processes to manage the quality of prescribing.

These strategies must recognise the central role played by GPs in primary care prescribing. Strategies and action plans should be agreed and supported by the trust board and the management team. Appendix 5 outlines what the strategies and plans should cover.

A director should be nominated to take responsibility for the action plan, and the trust board should receive regular progress reports. Depending on the relationship agreed between the PCT and its LHCCs, responsibility for the action plan may be devolved to LHCC level with the PCT having less direct involvement.

### *Health board-wide working*

In addition to having strategies and plans for implementation at PCT level, there is a need to establish co-operative working across the various elements of the health board. Constructive joint working between acute and primary care sectors offers real opportunities to improve the quality and cost of care. Some of the major areas for collaboration are discussed below.

## Area Drugs & Therapeutics Committee

The health board, PCT and acute trust need to establish an effective Area Drugs & Therapeutics Committee (ADTC). The work of this committee should include reviewing new drugs and advising on prescribing. While some health boards have effective ADTCs with appropriate powers and responsibilities this is not always the case.

The creation of PCTs and the restructuring of acute trusts provides an opportunity to establish effective trust DTCs and to enable the health board ADTCs to ensure consistency in prescribing across all parts of the health board. The impact on primary care prescribing of secondary care prescribing must be understood and taken into consideration when decisions are made. The ADTC should have the power to review the proposed action of DTCs if such actions impact on other trusts. The composition of the ADTC must allow for adequate input from both the primary and acute sectors.

The cost effectiveness of new drugs must also be assessed. Most health boards are clear about the respective roles of ADTCs, the management team (including any sub-committees reviewing budgetary implications and relative priorities) and the Board, but some have a more collaborative approach than others. Understanding and co-operation between the various groups involved is important. There are clear benefits from close working between those assessing the effectiveness of a new drug and the circumstances in which it is effective, those determining its cost effectiveness, and those determining how much funding should be allocated to its provision and in what circumstances.

If the NHS is to provide a cost effective, seamless service it is vital that there is understanding and agreement, not only on the prescribing of new drugs but also on a number of other prescribing issues. For example hospital led prescribing and drug industry discounting to the acute sector must be addressed at area level if NHS resources are to be maximised and patients provided with care which is seamless, and clinically and cost effective.

## Scottish Health Technology Assessment Centre

The White Paper *'Designed to care'* places considerable emphasis on the need to base treatment decisions on evidence, and to focus limited resources on those treatments which offer the greatest benefits[24]. The Scottish Health Technology Assessment Centre (SHTAC) will play an important part in providing health boards, trusts and clinicians with the necessary information. All boards will receive the same assessment of the costs and benefits of a particular treatment (undertaken by experts across Scotland) at the same time.

This should reduce both duplication of effort by ADTCs and variations in the availability of different treatments across Scotland. It should also ensure a greater pool of expertise to draw on in reviewing new drugs.

As well as reviewing new drugs to decide whether or not to recommend their use, there is also a need to review their effectiveness over time as new drugs and other treatments become available. Again there is a strong argument that this work should be co-ordinated throughout Scotland and that SHTAC may be the body most suited to arrange for systematic reviews to be undertaken.

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[24] Scottish Office Department of Health, *'Designed to Care'*, 1997.

## Hospital/primary care interface

The interface between hospital and primary care is a difficult boundary, although the new organisational arrangements should help to make it easier to agree shared priorities within a health board area and to put them into effect through the new funding arrangements.

There can be particular problems at this interface. Pharmaceutical companies often discount the price of their drugs to hospitals, so that a drug which is cheap to prescribe to a patient in hospital can become very expensive when the patient is discharged home. This can lead to less cost-effective prescribing unless there is good communication and co-operation between the two sectors. While it is generally accepted that discounting is less of a problem than in previous years it is still a problem with some drugs.

Another potential problem arises if a consultant prescribes a drug to a select group of patients but this is interpreted by the GP as indicating that the drug is appropriate for more widespread prescribing.

With the introduction of PCTs and larger acute trusts it should be possible to improve the management interface between hospital and primary care. The impact of cost shifting will be more apparent, and PCTs provide a primary care sector focus for discussion between the primary and secondary sectors.

Ensuring that there is a strong ADTC whose decisions are respected by all, along with respected groups determining cost effectiveness and appropriate use, is important if the interface is to be managed well. Health boards have a key role in ensuring, that all involved are committed to an area wide approach to prescribing.

The production of shared care protocols developed and agreed jointly should also be easier with the new trust structure. Protocols are already common, but we found some which had been developed with little input from the primary care sector. The decision to transfer prescribing should be based on whether it is clinically appropriate, and should only take place once protocols have been agreed.

Another way to improve co-operation and communication is the use of an area wide joint formulary. Formularies are widely used but the standard, number used and compliance varies from health board to health board. There will always be good reason to prescribe outwith a formulary, but there should be wide agreement about the formulary contents and a high level of compliance with it.

There is now more potential to shift resources from the acute trust to the PCT and vice versa so that money can move with prescribing responsibility. This should help to ensure that prescribing moves between the acute sector and primary care only because of the benefits which will accrue to the patient.

# Recommendations

## Quality

- *PCTs, LHCCs and GP practices should review local practice prescribing data to identify where there is scope for further improvement.*

- *Prescribing advisors should also work with practices which have low prescribing costs, which may be the result of under-diagnosis and under-treatment.*

- *Practices should review their prescription of drugs from the BNF's list of drugs 'less suitable for prescribing'.*

- *PCTs, ISD and others should agree a set of appropriate quality indicators for monitoring prescribing at practice and trust level. This work should take account of the Primary Care Indicators Group.*

- *PPD/ISD should work with prescribing advisors to agree how these indicators can best be produced to effectively identify good and poor prescribing within practices.*

- *Work should continue to develop morbidity information that can be used to produce robust practice prescribing budgets. This work needs to include prescribing advisors and take account of the work already undertaken by the Arbuthnott review.*

## Cost

- *We have identified total potential savings from therapeutic substitutions and premium price preparations of £49 million, or £24 million if a shift of 50% can be achieved. GP practices should review this at practice level to eliminate prescribing which is not cost effective.*

- *We have identified £4 million expenditure on 'limited value' drugs. PCTs, LHCCs and practices should review their prescribing if a large number, or high value, of 'limited value' drugs are being prescribed, to eliminate prescribing which is unnecessary.*

- *PCTs, LHCCs and practices should review their prescribing of 'over prescribed drugs' to ensure their optimum use. Our broad estimate is that over prescribing could be of the order of £28 million.*

## Repeat prescribing

- *Each practice should review its repeat prescribing system to ensure that it is safe and effective. PCTs should assist GPs to take action to improve systems where necessary.*

- *PCTs should establish whether medication reviews of patients on multiple medication have been carried out in the past, and consider whether a programme of reviews should be introduced.*

## Support for GPs and multi-disciplinary working

### *Multi-disciplinary working*

- *PCTs should consider how best to implement the CRAG document 'Clinical pharmacy practice in primary care'.*

- *PCTs should satisfy themselves that the arrangements for support provide both the appropriate level of prescribing advisor support, and the best mix of advisors.*

- *PCTs and health boards should review the administrative and IT support required if prescribing advisors are to work effectively with GPs.*

- *ISD, PPD and prescribing advisors should work together to ensure that:*

  - *ISD carries out the analysis which can most effectively be done centrally to achieve economies of scale.*

  - *information is provided in a timely fashion, and in the most appropriate format and medium.*

- *In each PCT, prescribing advisors, GPs, community pharmacists and practice pharmacists should agree a strategy for working together to promote rational prescribing. This will entail a balance between the needs and interests of individual practices, and the effectiveness of PCT-wide initiatives.*

- *PCTs should encourage LHCCs and practices to develop, agree and monitor prescribing protocols in different clinical areas.*

### *Community and practice pharmacists*

- *PCTs should consider the appropriate level and type of pharmacist support required by GP practices. This should involve clear identification of the objectives and costs of the proposed approach, together with agreed targets for improvements in quality and reductions in cost.*

- *PCTs should encourage GPs and community pharmacists to consider different ways of working with patients to carry out medication reviews at either the GP practice or the pharmacy.*

- *The various clinical pharmacy training programmes currently provided with health board funding should be reviewed to assess whether they develop the necessary skills for the widening role of pharmacists.*

### *Information to support prescribing*

- *ISD should continue its development of more sophisticated prescribing information, including analyses based on SCOTR PU and DDDs.*

- *Prescribing advisers, LHCCs and practices should agree the information required to assist in the development and monitoring of prescribing protocols.*

## Computerisation

- *Increased use of computers to produce prescriptions, will help to develop the national information required for clinical audit, clinical governance and research on the effectiveness of drugs. Each PCT should investigate ways of increasing the number of GPs making full use of computerisation, including training and targets for uptake.*

- *ISD and PPD should work together to ensure that the central processing of prescriptions generates the management information required. This may require changes in the coding of certain fields, compatibility with the systems for paying pharmacists, and the timeliness with which information is provided.*

- *If the NHS in Scotland is to have an integrated prescribing system it is essential that it is planned as part of an overall strategy. The lead the ME has shown on electronic prescribing is to be commended. We would support the production of an agreed plan that lays down a systems framework to which all new developments must conform, thus ensuring an integrated system is achieved in the medium term.*

## Prescribing budgets

- *The new primary care trusts need to manage prescribing budgets in line with the principles already established by prescribing advisors. These include:*
  - *transparency*
  - *agreement with GPs*
  - *based increasingly on accurate weighted capitation*
  - *expenditure against budget monitored on a timely basis*
  - *clear understanding of what corrective action will be taken to bring spend into line with budget.*

### *Targeted financial incentives*

- *PCTs should agree with LHCCs and GPs the most appropriate incentive schemes. All incentive schemes should have:*
  - *the support of GPs*
  - *clear and relevant objectives*
  - *measurable and attainable targets*
  - *outcomes that are measured and assessed.*

## Strategies and plans

- *PCTs should have prescribing strategies and action plans which are agreed and clearly supported by the management team and the board. These strategies and plans should be understood by all those involved with the trust (Appendix 5). A nominated director should have clear responsibility for the action plan, and the trust board should receive regular progress reports.*

### *Health board-wide working*

- *Health boards should consider developing a joint formulary with their local trusts, against which the level of compliance can be monitored.*

- *Shared care protocols should be developed and agreed jointly. The new structures and financial flows enable resources to shift between trusts in line with the prescribing responsibility for a given drug, and this should allow more effective care to be delivered.*

- *To achieve an effective working partnership the health board and its trusts need to ensure that the Area Drugs and Therapeutics Committee (ADTC) is effective. This requires adequate input from all the relevant interests, with appropriate powers and responsibilities, and close links with other groups such as the committees reviewing budgetary implications, clinical audit and trust Drugs and Therapeutics Committees. Adherence to its decisions and recommendations should be monitored.*

# Appendix 1: Weighting systems

This appendix gives a short description of the most commonly used weighting systems.

## PU

The Prescribing Unit (PU) is a prescribing cost denominator that attaches a weighting of 3 to patients aged 65 years and over, and a weighting of 1 to all other patients. The need for a more sophisticated prescribing cost denominator has led to the development of the following measures.

## ASTRO PU

The Age, Sex and Temporary Resident Originated Prescribing Unit (ASTRO PU) is used in England to help determine prescribing budgets. This measure was designed to take account for demographic variations in the age and sex of practice populations by weighting patient groups on the basis of the expenditure per patient in a number of age and sex bandings. ASTRO PUs incorporate 18 age-sex groups and one temporary resident group based on the Net Ingredient Cost of prescribed drugs over a one-year period. However, these weightings only account for some of the variation in costs between practices, since factors other than age and sex influence prescribing. According to the authors[25], adjustments for demographic variables with the ASTRO PU probably account for 25% of the variation between practices' costs, leaving the majority of the variation to be explained by practice variables, doctor-patient variables and local morbidity patterns.

## ASTRO(97) PU

In response to suggestions that the ASTRO PU was inaccurate in giving undue weighting to the elderly, it was recalculated and the new values presented to one decimal place. This new measure, the ASTRO(97) PU gave larger weights to patients aged over 65 (but the value of 0.5 for temporary residents was retained).

## STAR PU

Specific Therapeutic group Age-sex Related Prescribing Units (STAR PUs) were developed in order to make comparisons of prescribing costs at lower levels of aggregation more valid. A STAR PU was developed for the following eight BNF chapters: GI system (chapter 1), cardiovascular system (chapter 2), respiratory system (chapter 3), central nervous system (chapter 4), infection (chapter 5), endocrine system (chapter 6), musculo-skeletal and joint diseases (chapter 10) and skin (chapter 13).

## SCOT PU

The original Scottish age-sex prescribing costs weighting (SCOT PUs) was derived from a random sample of 1,000 dispensed and priced NHSiS prescription forms per month collected by PPD between April 1994 and March 1996 (24,000 prescriptions).The main advantages of this system compared with ASTRO(97) PUs are that it reflects Scottish prescribing practice, it is easily updated from routinely collected data, and it is not based on a sample of GP practices where prescribing habits may be atypical. However, the disadvantages are that it does not weight for temporary residents (TRs), and the sample size is fairly small.

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[25] Sarah J Roberts, Conrad M Harris: *'Age, sex and temporary resident originated prescribing units (ASTRO PUs): new weightings for analysing prescribing of general practices in England'*, BMJ August 1993.

## SCOTR PU

The age-sex weights have been updated to include data up to March 1997; temporary residents have been assumed to have a cost weight equal to 0.5 of the cost of a male under 5 years. The weighting of 0.5 for a temporary resident is in line with the ASTRO PU figure and the findings from work carried out by the prescribing advisors at Argyll and Clyde Health Board. The under 2 age-band has also been merged with the 2-4s, since the numbers in each cell were small and sampling variance was very high.

The following table shows a comparison of relative age-sex prescribing cost weights (expressed relative to the cost of males < 2):

| **Males** | **<2** | **2-4** | **5-15** | **16-24** | **25-44** | **45-54** | **55-59** | **60-64** | **65-74** | **75+** | **TRs** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SCOT PUs (M) | 1.00 | 0.66 | 1.07 | 0.80 | 1.49 | 3.97 | 3.97 | 3.97 | 7.40 | 9.26 | - |
| SCOTR PUs (M) | 1.00 | 1.00 | 1.36 | 1.01 | 1.87 | 4.97 | 4.97 | 4.97 | 9.21 | 11.6 | 0.5 |
| ASTRO(97) PUs (M) | 1.00 | 1.00 | 1.40 | 1.70 | 2.00 | 2.80 | 4.40 | 7.60 | 10.1 | 11.8 | 0.5 |
| **Females** | **<2** | **2-4** | **5-15** | **16-24** | **25-44** | **45-54** | **55-59** | **60-64** | **65-74** | **75+** | **TRs** |
| SCOT PUs (F) | 0.74 | 0.76 | 0.97 | 1.67 | 2.11 | 4.93 | 4.93 | 7.08 | 6.84 | 8.66 | - |
| SCOTR PUs (F) | 0.96 | 0.96 | 1.22 | 2.13 | 2.66 | 6.18 | 6.18 | 8.80 | 8.51 | 10.86 | 0.5 |
| ASTRO(97) PUs (F) | 0.80 | 1.20 | 1.20 | 2.10 | 2.40 | 3.20 | 5.40 | 7.20 | 9.60 | 10.60 | 0.5 |

While the above table shows 10 age groupings for SCOTR PU males and females this is simply for ease of comparison with the ASTRO(97) PU. There are actually only nine females and eight male age bands. The ratios in the above table are based on the cost per head of each age group as a ratio of the 0-4 band. The costs per head of each age band are given below.

| **Male** | 0-1 | 2-4 | 5-15 | 16-24 | 25-44 | 45-64 | | 65-75 | 75+ |
|---|---|---|---|---|---|---|---|---|---|
| | £22 | £22 | £29 | £22 | £41 | £108 | | £99 | £251 |
| **Female** | 0-1 | 2-4 | 5-15 | 16-24 | 25-44 | 45-59 | 60-64 | 65-75 | 75+ |
| | £21 | £21 | £26 | £46 | £58 | £134 | £191 | £184 | £235 |

## Weighting for deprivation/morbidity

None of the above weight for morbidity. However weighting systems which weight for morbidity as well as age and sex have been developed. The 'Hancock' system uses a weighting for morbidity and the system proposed in the Arbuthnott Report also proposes the inclusion of weightings for deprivation/ morbidity. The use of accurate weightings for morbidity and deprivation would be of great benefit as deprivation has a considerable impact on prescribing.

The Arbuthnott Report recommends a revised weighted capitation for the allocation of the GP prescribing budget to health boards based on age-sex and morbidity life circumstances weightings. In terms of the adjustment for age and sex the report makes the following proposals:

> " It is therefore proposed that the age-sex weights used by the current GP prescribing formula be retained and updated, with extra adjustments to increase the sample size and to account explicitly for temporary residents."

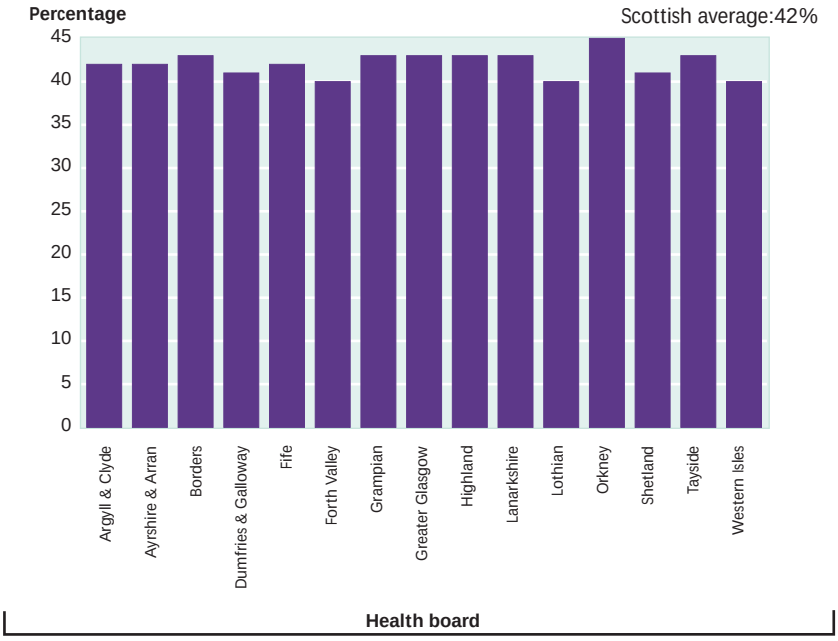
The SCOTR PU weightings used in our report use the age-sex weightings proposed by the Arbuthnott report.

The proposed weightings for morbidity and life circumstances are based on breaking GP prescribing down into diagnostic categories of drug according to BNF chapters and applying the key influences of deprivation, dependency, social class and ethnic indicators.

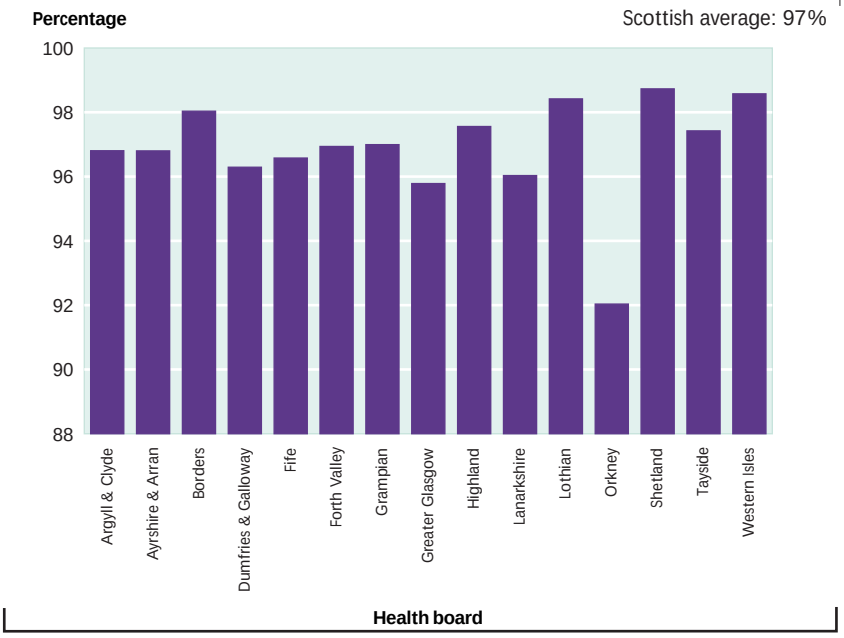
# Appendix 2: Quality indicators by health board

## Indicators of good clinical practice

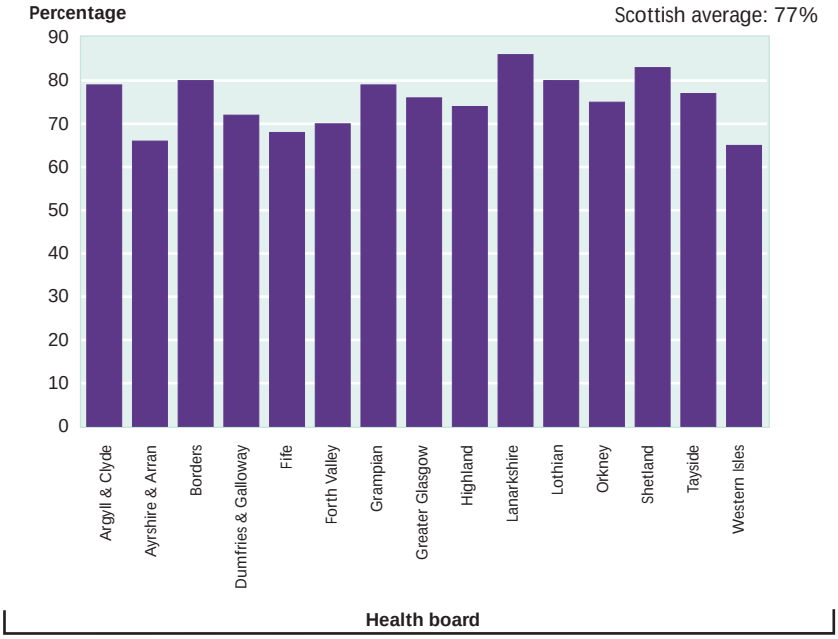
**Percentage of inhaled steroids and cromoglycates as a percentage of inhaled steroids and cromoglycates and beta2 agonists (based on DDDs in 1998)**



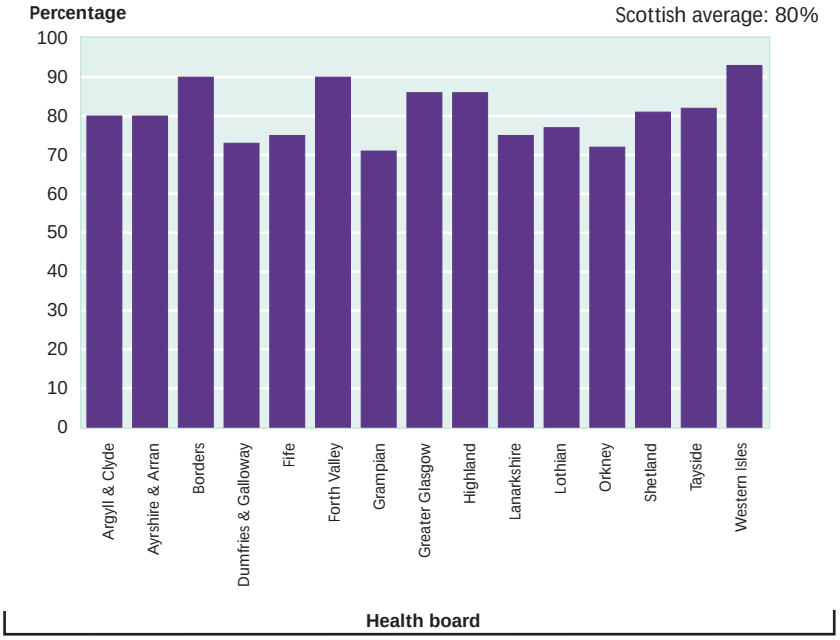

**Inhaled beta$_2$ agonists as a percentage of all beta$_2$ agonists (based on DDDs in 1998)**



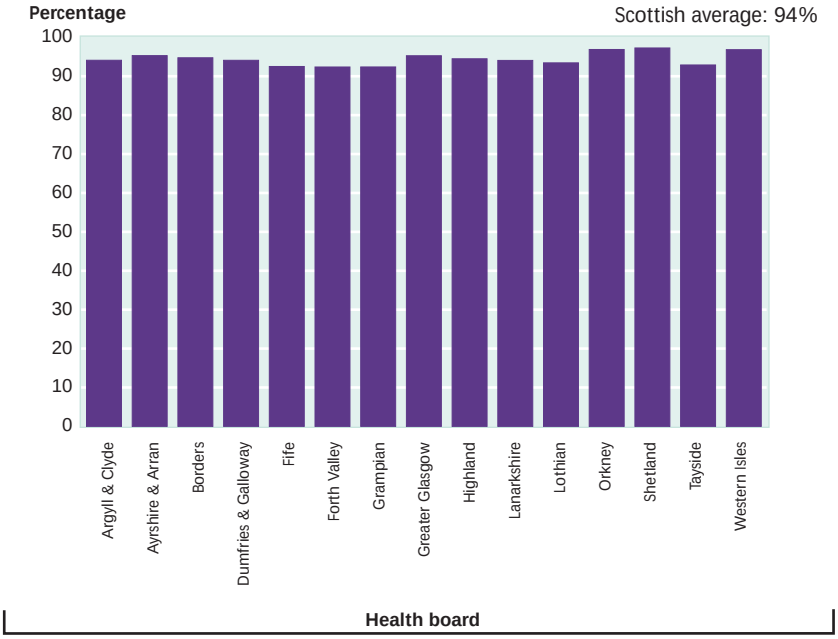
**Bendrofluazide 2.5mg tablets as a percentage of the total use of all bendrofluazide (based on number of tablets in 1998)**



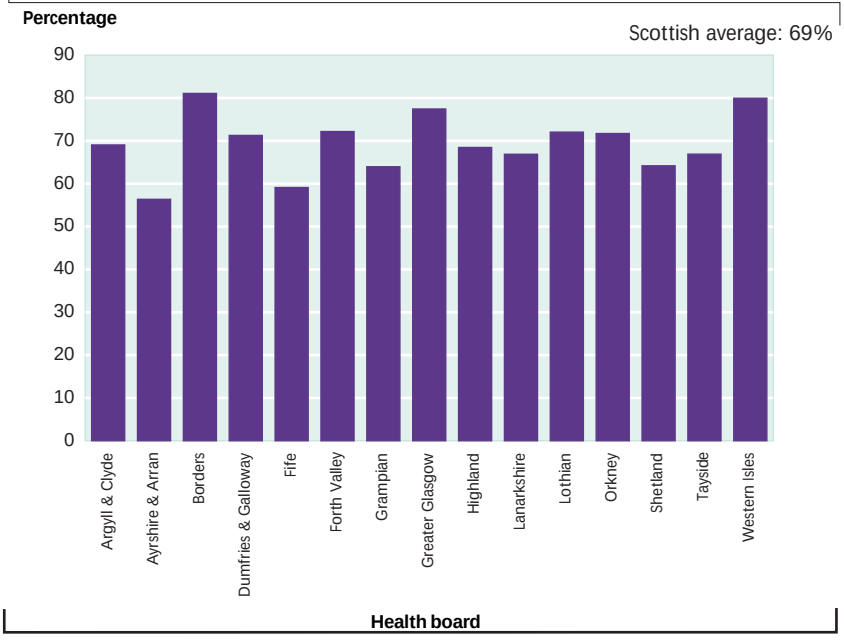

**Amoxycillin as a percentage of amoxycillin and co-amoxiclav (based on DDDs in 1998)**



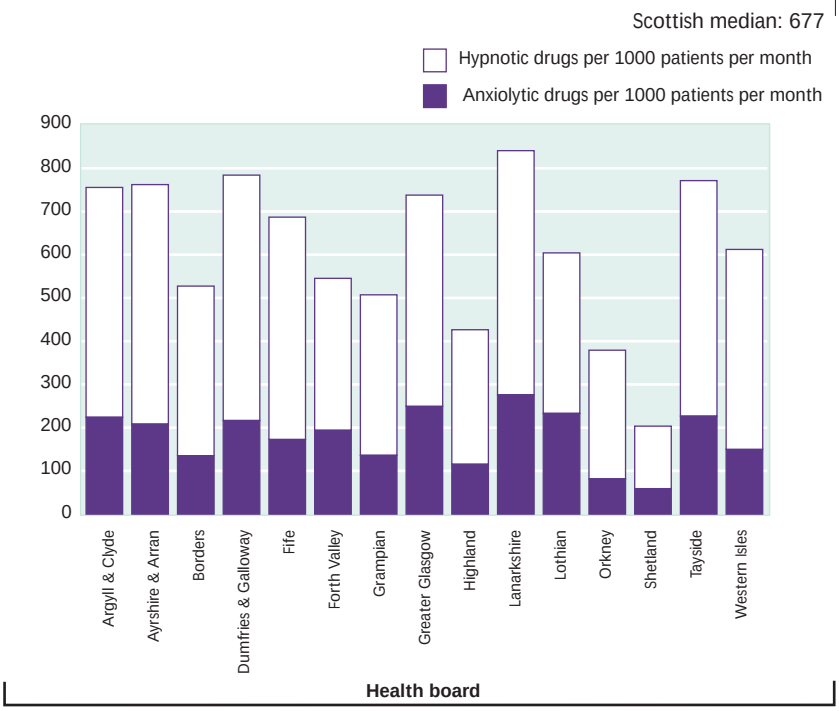
**Established oral antibiotics as a percentage of all oral antibiotics (based on DDDs in 1998)**




**Single diuretics as a percentage of single and combination diuretics (based on DDDs in 1998)**



**Hypnotic and anxiolytic drugs in DDDs per 1000 patients per month in 1998**

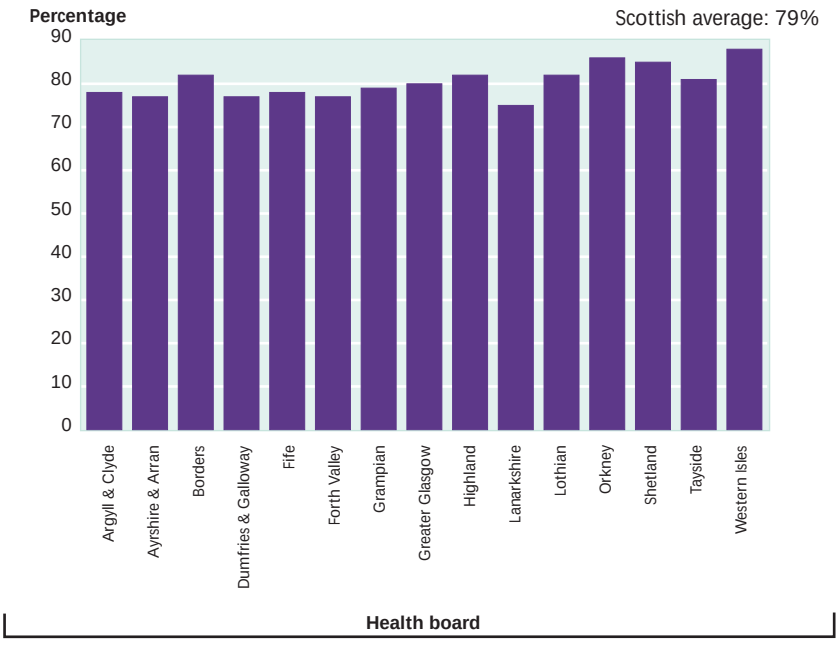



The graphs above show the variation between health boards for the indicators of good clinical practice. A greater degree of variation can be seen in the percentage of inhaled steroids & cromoglycates (as a percentage of inhaled steroids & cromoglycates & Beta$_2$ agonists), the percentage of established oral antibiotics as a percentage of all oral antibiotics, and also for anxiolytic drugs per 1000 patients & hypnotic drugs per 1000 patients.

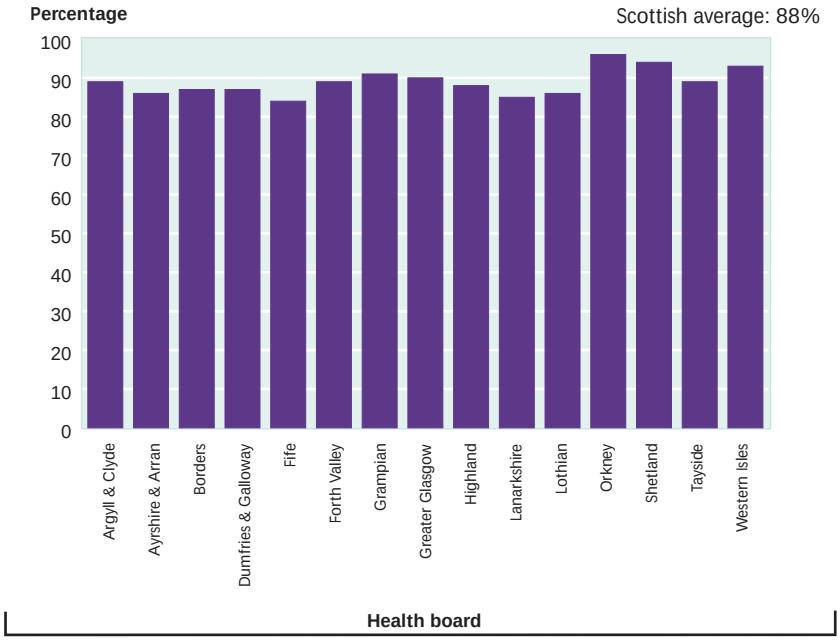
## Indicators of formulary compliance:

There is a greater degree of variation between health boards with regard to the two indicators of formulary compliance, as illustrated in the two graphs below.

**Top four NSAIDs as a percentage of all NSAIDs (based on DDDs in 1998)**



**Top four beta-blockers as a percentage of all beta-blockers (based on DDDs in 1998)**



# Appendix 3: 1998 prescriptions and costs of drugs the BNF classes as 'less suitable for prescribing'

| BNF CLASS | Drug Name | Scripts | Cost |
|---|---|---|---|
| **01** | Gastro-intestinal System | | |
| 0101010N | Mucaine | 25,897 | £49,824 |
| 0101020S | Sodium Bicarbonate Compound | 1,534 | £619 |
| 0102000N | Hyoscine Butylbromide 1m | 8,522 | £36,681 |
| 0103060E | Carbenoxolone Sodium Compound Preparations | 1,026 | £23,195 |
| 0104010H | Kaolin Light | 3,033 | £1,460 |
| 0104020D | Codeine Phosphate Compound Mixtures | 521 | £2,162 |
| 0104020N | Opium & Morphine | 921 | £596 |
| 0106030P | Liquid paraffin | 7 | £14 |
| 0106040J | Magnesium Hydroxide | 522 | £833 |
| | ***Total*** | 41,983 | £115,384 |
| **02** | Cardiovascular System | | |
| 0202010B | Berkozide | 1,938 | £2,810 |
| 0202080B | Bendrofluazide/Potassium | 10,233 | £44,649 |
| 0202080C | Bumentanide/Potassium | 60,761 | £143,435 |
| 0202080K | Frusemide/Potassium | 19,507 | £105,287 |
| 0205020E | Clonidine hcl | 2,193 | £20,736 |
| 0205030C | Bethanidine Sulphate | 43 | £839 |
| 0205030H | Debrisoquine Sulphate | 422 | £5,878 |
| 0205051V | Enalapril Maleate | 150 | £3,165 |
| 0206401F | Cinnarizine | 1,939 | £12,725 |
| 0206041L | Nicotinic Acid Derivatives | 11,318 | £291,579 |
| 0206041P | Oxpentifylline | 8,106 | £201,878 |
| 0206041S | Rutosides | 17,228 | £205,558 |
| 0206041T | Thymoxamine Hcl | 1,907 | £51,244 |
| 0206042D | Co-dergocrine Mesylate | 413 | £4,256 |
| | ***Total*** | 136,158 | £1,094,039 |
| **03** | Respiratory Systems | | |
| 0301012F | Ephedrine Hcl | 871 | £2,535 |
| 0301012S | Orciprenaline Sulphate | 18,320 | £48,853 |
| 0301040M | Fenoterol Hudrobromide | 42,052 | £489,081 |
| 0301040R | Salbutamol | 82,106 | £1,934,371 |
| 0302000C | Beclomethasone Dipropionate | 5,750 | £60,033 |
| 0303000Q | Sodium Cromoglycate | 733 | £29,949 |
| 0310000N | Pseudoephedrine Hcl | 19,433 | £32,862 |
| | ***Total*** | 169,265 | £2,597,684 |
| **04** | Central Nervous System | | |
| 0401010B | Chloral Hydrate | 3,968 | £16,970 |
| 0401010C | Chloral Betaine | 9,803 | £35,213 |
| 0401010X | Triclofos Sodium | 1,952 | £35,588 |
| 0401020R | Meprobamate | 3,231 | £11,448 |
| 0401030C | Amylobarbitone | 456 | £3,752 |

| BNF CLASS | Drug Name | Scripts | Cost |
|---|---|---|---|
| 0401030E | Amylobarbitone Sodium | 2,094 | £37,222 |
| 0401030H | Butobarbitone | 1,010 | £12,210 |
| 0401030T | Quinalbarbitone Sodium | 1,437 | £24,764 |
| 0402010S | Promazine Hcl | 5,622 | £11,045 |
| 0403010B | Amitriptyline Hcl | 13,069 | £97,793 |
| 0403010F | Clomipramine Hcl | 2,499 | £40,075 |
| 0403010V | Nortriptyline | 6,362 | £18,821 |
| 0403020Q | Tranylcypromine Sulphate | 230 | £878 |
| 0405020R | Phentermine | 1,095 | £2,008 |
| 0406000D | Cinnarizine | 13,382 | £67,501 |
| 0406000P | Metoclopramide Hcl | 4,380 | £46,517 |
| 0406000T | Prochlorperazine Maleate | 28,021 | £94,348 |
| 0407010A | Aspav | 648 | £7,975 |
| 0407010F | Cocodamol (Codeine Phosphate & Paracetamol) | 1,350,201 | £6,483,821 |
| 0407010M | Cocodaprin (Aspirin & Codeine Phosphate) | 3,999 | £9,961 |
| 0407010N | Codydramol | 437,148 | £601,344 |
| 0407010Q | Coproxamol | 1,479,988 | £1,632,080 |
| 0407010X | Paracetamol Combined Preparations | 62,727 | £746,882 |
| 0407020T | Pentazocine Hcl | 3,686 | £49,573 |
| 040702U | Pentazocine Lactate | 208 | £5,317 |
| 0407041A | Analgesics with Anti-emetics | 47,564 | £221,687 |
| 0407041F | Ergotamine Tartrate | 5,757 | £125,023 |
| 0407041N | Isomethaptene Mucate | 2,987 | £21,793 |
| 0407042F | Clonidine Hcl | 36,472 | £305,050 |
| 0407042L | Methysergide | 232 | £3,640 |
| | ***Total*** | 3,530,228 | £10,770,299 |
| **05** | Infections | | |
| 0501080H | Sulfametopyrazine | 802 | £6,066 |
| 0501130H | Hexamine Hippurate | 1,636 | £12,578 |
| 0503000G | Inosine Pranobex | 47 | £2,558 |
| 0504010N | Pyrimethamine | 12 | £35 |
| | ***Total*** | 2,497 | £21,238 |
| **06** | Endocrine System | | |
| 0603040F | Cortisone Acetate | 1,261 | £5,282 |
| 0603040X | Prednisone | 80 | £135 |
| 0604012S | Progesterone Vaginal | 2,014 | £37,643 |
| 0604030L | Nandrolone Decanoate | 191 | £1,761 |
| | ***Total*** | 3,546 | £44,821 |
| **07** | Obstetrics, Gynaecology, and Urinary-tract Disorders | | |
| 0701030S | Ritodrine Hcl | 2 | £26 |
| 0702010L | Tampovagan Intravaginal | 65 | £1,023 |
| 0704010C | Bethanechol Chloride | 757 | £4,125 |
| 0704010F | Carbachol | 20 | £231 |
| | ***Total*** | 844 | £5,404 |

| BNF CLASS | Drug Name | Scripts | Cost |
|---|---|---|---|
| **09** | Nutrition and Blood | | |
| 0901011P | Ferrous Sulphate | 22,130 | £16,067 |
| 0901011Q | Iron & Folic Acid | 6,785 | £5,913 |
| 0901020D | Cyanocobalamin | 1,348 | £9,316 |
| 0902011U | Potassium Chloride | 70,836 | £107,441 |
| 0905012C | Sodium Cellulose Phosphate | 118 | £2,528 |
| 0906027G | Vitamin B Compound | 93,339 | £37,362 |
| 09060280 | Other Vitamin B Preparations | 242 | £7,879 |
| | ***Total*** | 194,798 | £186,506 |
| **10** | Musculoskeletal and Joint Diseases | | |
| 1001010J | Ibuprofen | 14,448 | £155,393 |
| 1002020G | Carisoprodol | 1,540 | £9,599 |
| 1002020S | Methocarbamol | 21,795 | £222,557 |
| | ***Total*** | 37,783 | £387,549 |
| **11** | Eye | | |
| 1104010D | Betamethasone Sodium Phosphate | 2,788 | £2,065 |
| 1104010I | Dexamethasone | 5,043 | £10,967 |
| 1104010K | Fluoromethalone | 124 | £310 |
| 1104010S | Prednisolone Sodium Phosphate | 3,806 | £5,793 |
| 1108010S | Hypromellose with Phenylephrine | 437 | £709 |
| | ***Total*** | 12,198 | £19,844 |
| **12** | Ear, Nose, and Oropharynx | | |
| 12010104 | Sofradex Eye | 12,065 | £70,598 |
| 12010105 | Otomize Ear | 2,262 | £10,144 |
| 1201010E | Vistamethasone Nose | 24,469 | £36,383 |
| 1201010G | Neocortef Eye Ear | 1,825 | £6,008 |
| 1201010H | Chloramphenicol Ear | 157 | £234 |
| 1201010Q | Otosporin Ear | 23,691 | £76,288 |
| 1201010Z | Audicort Ear | 5,621 | £9,693 |
| 1201030F | Docusate Sodium Ear | 3,136 | £3,037 |
| 1201030H | Almond Family Health | 32,097 | £44,288 |
| 1201030K | Sodium Bicarbonate Ear | 4,591 | £5,566 |
| 1201030N | Otex Ear | 5,110 | £10,793 |
| 1202030D | Fusafungine | 555 | £901 |
| | ***Total*** | 115,579 | £273,932 |
| **13** | Skin | | |
| 1306010G | Corticosteroids | 1,059 | £11,197 |
| 1306010Q | Salicylic Acid | 653 | £2,844 |
| 1310011P | Neomycin Sulphate | 2 | £3 |
| 1310020V | Toepedo | 307 | £415 |
| 1310020Z | Phytocil | 192 | £301 |
| 13100301 | Idoxuridine in Dimethyl Sulphoxide | 1,221 | £8,325 |
| 131400H | Heparinoid | 3,628 | £5,328 |
| | ***Total*** | 7,062 | £28,414 |
| **19** | Other Drugs And Preparations | | |
| 19020300 | Milk Weleda | 427 | £960 |
| 19040100 | Tragacanth | 16,514 | £1,712 |
| | ***Total*** | 16,941 | £2,671 |
| | **Grand Total** | 4,268,882 | £15,547,784 |

# Appendix 4

## Questions to consider when assessing the level of prescribing support

- What areas could be improved (quality and cost)?
- What is the most appropriate way to achieve the improvement (GPs with limited prescribing advisor support, GPs work alone, GPs with pharmacist support, pharmacist with GP support etc.)
- What are the objectives of providing support?
- What type of service is to be provided? For example,
  - talks by pharmacists to GPs on how the GPs might improve their prescribing
  - support with:
    - generic prescribing
    - repeat prescribing systems
    - medication reviews
    - polypharmacy reviews
    - brown bag reviews
    - formulary review
    - compliance with formulary
    - prescribing analysis
    - reviewing patients with specific conditions
    - computerisation
- pharmacist-run patient clinics (asthma, warfarin, etc.)
- What would each individual type of support provide?
- For how long will each type of support be required?
- Are GP practices in agreement with the PCT about support would be most beneficial?
- Has similar support been provided in the past to other practices within the PCT? By other PCTs? What were the outcomes? Why?
- Will the proposed support achieve the objectives in the most cost effective manner?
- Is the proposed support equitable?
- Is the proposed total package of support achievable in terms of total resources available?
- How will the proposal support be evaluated?

# Appendix 5: Strategies and action plans

Strategies and action plans should be agreed and clearly supported by the management team and the board. They should:

- relate to the overall strategy of the PCT and be in accord with the Health Improvement Programme (HIP), the Trust's Improvement Plan (TIP) and national priorities
- seek to improve the clinical effectiveness of prescribing
- recognise the needs of the patient and recognise the conflict that can exist between individual patient and the wider population perspective
- seek to improve the cost effectiveness of prescribing. It is essential to reduce unnecessary costs in order to free up money for new therapeutic initiatives which are appropriate
- contain clear objectives written in SMART (Specific, measurable, achievable, realistic, time limited) terms
- recognise;
  - the need to provide cost effective support to GPs
  - the benefits that can be gained from other primary care professionals particularly pharmacists working with GPs, and
  - the need for unbiased information
- recognise the variation in the needs and approach of practices and be flexible enough to ensure that in discussion with individual practices agreement can be reached on how best the practice can improve its prescribing and thereby contribute to the health of the population and the overall performance of the PCT/LHCC/health board
- address the appropriateness of hospital led prescribing
- encourage repeat prescribing reviews
- encourage audits of the various aspects of prescribing
- encourage the use of joint formularies
- address issues around the assessment and provision of new drugs
- recognise the value of prescribing advisors and what they can contribute in terms of support and management of prescribing.

# Appendix 6: Glossary of terms

| | |
|---|---|
| **ACE inhibitor** | Angiotensin-converting enzyme inhibitor: this class of drugs is one option for treating hypertension and heart failure. |
| **ADR** | Adverse drug reaction |
| **ADTC** | Area Drugs and Therapeutics Committee. |
| **Anxiolytic** | Sedative, tranquilliser |
| **ASTRO PU** | Age, Sex and Temporary Resident Originated Prescribing Unit; prescribing unit reflecting average drug expenditure per patient within nine age bands and by sex of patients. |
| **Benzodiazepines** | Group of drugs, now known to cause dependence at low doses, widely prescribed as hypnotics (sleeping pills) and anxiolytics (tranquillisers), especially between 1960 and the mid 1980s. |
| **Beta-blockers** | Beta-adrenocepter blocking drugs (beta-blockers) block the beta-adrenoceptors in the heart, peripheral vasculature, bronchi, pancreas and liver. They are all equally effective, but there are differences between them which may affect the choice in treating particular diseases or individual patients. |
| **BNF** | British National Formulary, published jointly by the British Medical Association (BMA) and the Royal Pharmaceutical Society of Great Britain (RPS), each March and September. |
| **Compliance** | The extent to which patients follow the instructions of the doctor or drug manufacturer when taking (or omitting to take) drugs. |
| **COPD** | Chronic Obstructive Pulmonary Disease |
| **CRAG** | Clinical Resource and Audit Group |
| **DDD** | Defined Daily Dose: the assumed average amount of a drug needed each day to obtain optimum therapeutic effect for adults suffering from the conditions for which it is most usually prescribed, based on DURG [WHO] recommendations. |
| **Diuretics** | Substances which increase urine and solute production by the kidney. |
| **Formulary** | List of selected drugs, sometimes accompanied by guidance and protocols for their use, compiled by most hospitals, health boards, some GP practices, and also some published by academic departments (Belfast, Newcastle, Lothian etc). |
| **Generic** | Copy of a drug whose patent has expired. |
| **GORD** | Gastro-oesophageal reflux disease |
| **GP** | General practitioner; family doctor in contract with the NHS. |
| **GPASS** | General Practice Administration System for Scotland. This standard system for the storage of morbidity and repeat prescribing data on computer is supplied by the Scottish Office. |
| **Hypertension** | High blood pressure; a risk factor for heart disease and strokes. |
| **Hypnotic** | Sleeping pill |
| **Indication** | A condition of disease, ie, one for which a drug has been licensed. |
| **IPS** | Indicative Prescribing Scheme |
| **ISD** | Information and Statistics Division |

| | |
|---|---|
| **LHCC** | Local Health Care Co-operative |
| **Lipid lowering drugs** | Used to reduce high blood cholesterol. |
| **ME** | Management Executive |
| **Morbidity** | Incidence of illness or disease (or health risk factors). |
| **MPA** | Medical Prescribing Advisor |
| **NSAID** | Non-steroidal anti-inflammatory drug, for rheumatism etc. |
| **OTC** | Over-the-counter medicine available without prescription. |
| **PCT** | Primary Care Trust |
| **Polypharmacy** | Prescribing a patient several different drugs; some may be required to counteract the side effects of the others. |
| **PPA** | Pharmacist Prescribing Advisor |
| **PPD** | Pharmacy Practice Division |
| **PRISMS** | Prescribing Information System for Scotland |
| **RCGP** | Royal College of General Practitioners |
| **Repeat prescription** | Officially defined as a prescription issued without a consultation. A broader definition is a second or subsequent prescription of a drug for treatment of a stable chronic condition requiring long-term medication. |
| **SCOT PU** | Scottish prescribing unit, calculated from age-sex specifc prescribing cost data. |
| **SCOTR PU** | Measure reflecting Scottish prescribing practice, taking account of age, sex and temporary residents. |
| **SHPIC** | Scottish Health Purchasing Information Centre |
| **SHTAC** | Scottish Health Technology Assessment Centre |
| **Side effect** | Unplanned (and usually undesirable) additional effect of a drug on an individual patient. |
| **SIGN** | Scottish Intercollegiate Guidelines Network. |
| **SIR74** | Age-sex standardised self-reported limiting long-term illness ratio of those under 75, based on the 1991 Census. |
| **SMeRC** | Scottish Medicines Resource Centre |
| **SPA** | Scottish Prescribing Analysis. |
| **SSRI** | Selected Serotonin Re-uptake Inhibitor; class of antidepressant drugs. |
| **Sustained release** | Modified release formulation of a drug which releases its chemical ingredients gradually, enabling it to be taken less frequently eg, once a day. |
| **Temporary resident** | Patient treated while away from home by a doctor from a practice other than that of the GP with which s/he is registered. |
| **Weighted capitation** | See Appendix 1. |
| **WHO** | World Health Organisation |

# Appendix 7: Advisory panel

Dr Stephanie Norris, Chair of the Scottish Association of Medical Prescribing Advisers

Ms Angela Timoney, Chair of the Scottish Pharmaceutical Prescribing Advisers Group

Professor Claire Mackie, Head of the School of Pharmacy, Robert Gordon University

Mrs Dorothy Anderson, Director, Pharmacy Practice Division

Dr Keith Beard, Hospital Prescribing Advisor, Greater Glasgow Health Board

Dr Beth Rimmer, Medical Prescribing Advisor, Western Isles Health Board

Dr Jan Jones, Pharmaceutical Prescribing Advisor, Tayside Health Board

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