A Scottish prescription

Managing the use of medicines in hospitals

Audit Scotland is a statutory body set up in April 2000 under the Public Finance and Accountability (Scotland) Act 2000. It provides services to the Auditor General for Scotland and the Accounts Commission. Together they ensure that the Scottish Executive and public sector bodies in Scotland are held to account for the proper, efficient and effective use of public funds.

Contents

Summary

Medicines can lead to significant health improvements but they need to be managed well so that patients get most benefit.

Background

1. The development of new medicines means that more patients can be treated for more conditions than in the past, often with better results. But the availability of these medicines means that managing medicines safely and effectively is more challenging, and costs are rising. NHS hospitals in Scotland spent £189 million on medicines in 2003/04, and this is estimated to increase to about £220 million by 2005/06.[1]

The study

2. In carrying out this study, we:

- interviewed staff at hospitals and NHS boards in all mainland boards: this included managers, senior medical staff, junior doctors, nurses and pharmacists

- collected and analysed information about pharmacy staffing

- reviewed relevant documents from the hospitals and NHS boards we visited

- interviewed staff from the Scottish Executive Health Department (SEHD) and other national bodies.

3. The focus of our review was acute hospitals, although a number of the hospitals we reviewed also provide pharmacy services to primary care hospitals. We visited acute hospitals in all mainland NHS boards and a small sample of mental health, care of the elderly and community hospitals. Our visits took place between November 2003 and September 2004. The review covered the 12 mainland NHS boards, two of which have more than one operating division. This gave a total of 15 NHS bodies as detailed in Appendix 2 (page 51).

4. We sent local reports and recommendations to each NHS body we visited.

Key findings

5. Spending on medicines in hospitals is increasing as medicines become available to treat more patients. These increases in spending can be minimised by cost-effective prescribing (Part 2, page 6).

6. The increasing range of medicines available and the increasing number of people involved in prescribing means that prescribers need easy access to guidance (Part 3, page 13).

7. Prescribers also need advice from clinical pharmacists who work with both patients and staff (Part 4, page 22).

8. The SEHD and NHS boards need better information to manage and monitor the use of medicines (Part 5, page 34).

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1 Official report, Col 986, Audit Committee, 25 January 2005. Also written evidence to Audit Committee from Dr Kevin Woods, Annex C. AU/S2/05/04/3, February 2005.

Part 1. Setting the scene

Introduction

9. Nearly all patients are treated with medicines when they are in hospital. As medicines become available to treat more patients, increasing use means that spending is rising. Medicines bring significant benefits, but they have to be used properly, in line with best practice, for patients to get the most benefit. NHS boards need staff with the appropriate skills and knowledge, with access to guidance, policies and procedures, and IT. Hospitals and primary care need to work together to share information so that the patient has continuity of care wherever they are treated. Exhibit 1 shows the complex range of factors that contribute to the success of treatments with medicines.

10. The safe and effective use of medicines can only be achieved through the work of a wide range of professional staff and through staff engaging with patients. Key members of the team are the prescribers, those involved in safely providing the medication and those involved in administering the medicine, including the patient. Other key members of the team include planners and finance managers who, working with the professionals, can ensure that the appropriate resources are available to meet patient needs. In recent times, professional boundaries have become less defined with the development of prescribing roles for nurses and pharmacists, the emergence of pharmacy technicians and the increasingly knowledgeable patient. The report concentrates on the role of the multidisciplinary team and details recommendations which are relevant to all disciplines.

11. The move to unified NHS boards in April 2004, presents a number of opportunities to increase coordination between hospitals and primary care and to make best use of staff and budgets. Opportunities include: a joint strategy for managing the use of medicines; area-wide policies and procedures; a single pharmacy service; joint posts that cover both hospital and primary care; and an area-wide information management and technology (IM&T) service.

12. The national strategy for pharmaceutical care in Scotland, *The Right Medicine*, was published in 2002.[2] This strategy covers hospital, primary care and community services. Recommendations for the hospital service focus on pharmacists working with patients in the wards and clinics, and ensuring that medicines are used safely and cost-effectively. This report assesses progress towards the strategy.

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2   *The Right Medicine – A strategy for pharmaceutical care in Scotland,* SEHD, 2002.

Exhibit 1
Factors that impact on patient outcome

A complex range of factors contribute to the success of treatment with medicines.
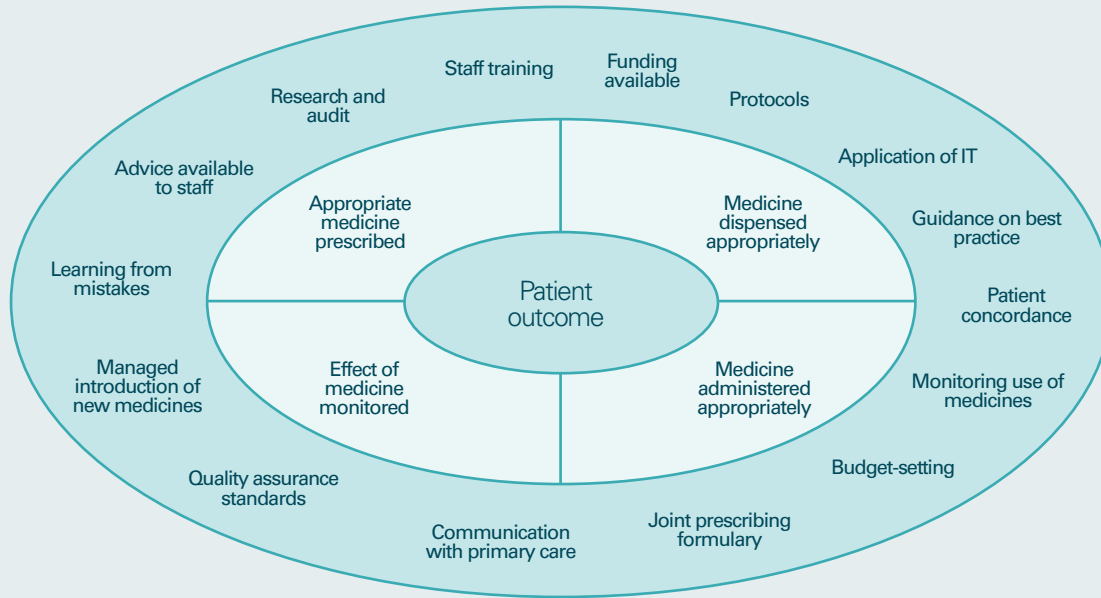
Source: Audit Scotland

Part 2. Spending on medicines

Main findings

- Spending on medicines in hospitals is increasing faster than overall hospital spending, leading to cost pressures for NHS boards.

- Much of the increase is due to the development of new medicines that can treat more patients, and the use of medicines for a wider range of conditions.

- NHS boards lack the robust information they need to set budgets and monitor performance.

Spending on medicines in hospitals is increasing

13. NHS hospitals in Scotland spent £189 million on medicines in 2003/04. This is over 5% of total hospital running costs. Hospitals are spending 56% more on medicines than in 1999/2000, while primary care is spending 47% more. Hospital running costs have increased by 32% over the same period. At the same time, the number of patients treated in hospitals is falling slightly[3] (Exhibit 2). The average spend on medicines per patient in an acute hospital has increased by 65% since 2001/02. This varies widely among clinical specialties.

14. Advances in medicines mean a wider range of conditions can now be treated. For example, in cancer services the number of people treated with chemotherapy across Scotland increased by 20% between 1997 and 2001.[4] People are living longer, and more are living with health problems that can be managed with medicines. Expenditure on medicines will continue to increase as medicines are developed that provide new or additional options for treating patients, and as evidence emerges that existing medicines can be used to benefit a wider range of patients.

15. NHSScotland introduced a clearer process for new medicines in 2001 when it established the Scottish Medicines Consortium (SMC). The SMC reviews the evidence on the effectiveness and cost-effectiveness of new medicines and produces national guidance to reduce variation in access to medicines across the country. The SMC had reviewed a total of 165 medicines by the end of 2004 and found just over 70% of them acceptable for use in Scotland, many with restrictions on their use: for example, treatment with some medicines should be started by specialist doctors only.

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3   The number of patients is the number of emergency inpatients, elective inpatients and day cases discharged from hospitals. The figures do not include maternity services, psychiatric units and long stay hospitals.
4   ISD Cancer Registry Data, extracted October 2004.

Exhibit 2

Expenditure on medicines in hospitals compared to the number of patients

The average expenditure on medicines per patient is increasing.

Source: Information and Statistics Division (ISD), NHS National Services Scotland

16. Previously, the Area Drugs and Therapeutic Committee (ADTC) of each board reviewed the evidence on a new medicine and reached its own conclusions. The work of the SMC has increased consistency across Scotland and allowed the ADTCs to focus on other areas of work.[5]

Many new medicines lead to better patient care and increased spending

17. Many new medicines improve patient care, leading to better outcomes, but can also lead to higher spending. NHS boards need cost-effective prescribing to minimise increases in expenditure and to make best use of money. They also need to ensure that budgets for medicines reflect these pressures as far as possible, given other priorities. Hospitals and primary care need to work together, managing prescribing across the healthcare system.

Cost-effective prescribing can minimise increases in spending on medicines

18. Hospitals have already made significant advances in controlling spending on medicines; national, zonal and local contracts are in place to purchase medicines for hospitals, and generic medicines are routinely supplied in hospitals through national contracts. The National Pharmacologistics Group, a subgroup of the Association of Scottish Chief Pharmacists, works in partnership with Scottish Healthcare Supplies to negotiate and award the national contracts.

19. NHS boards need to identify additional ways to achieve best value in their use of medicines, by ensuring that prescribing is in line with best clinical practice and is cost-effective. This means using treatment protocols and joint formularies that

identify and recommend cost-effective prescribing choices, and providing advice for prescribers through both clinical pharmacists and the use of IT.

Joint formularies can encourage cost-effective prescribing

20. A joint formulary is a list of medicines that the hospital and primary care services in a NHS board area have agreed should be used to treat most patients. Joint formularies help to promote high quality and cost-effective prescribing and coordinate prescribing between primary care and hospitals.[6] [7] Eight of the 12 mainland boards have a joint formulary. Six of these include an order of preference for medicines to treat some conditions. The order of preference is identified taking account of clinical and cost-effectiveness. Joint formularies should be updated regularly as new medicines or national guidelines become available.

5   *Evaluation of the impact of the Scottish Medicines Consortium in Medicines Management in Scotland*, Dr Corri Black, Department of Public Health, University of Aberdeen, August 2003.
6   *A Spoonful of Sugar*, Audit Commission, 2001.
7   *Supporting prescribing in general practice – a progress report*, Audit Scotland, June 2003.

Good practice example 1
NHS Lothian

The Lothian Joint Formulary was first launched in May 2001. It contains first and second line choices of medicines to support cost-effective prescribing. It also contains prescribing guidance notes. The electronic format is available on the NHS Lothian intranet and on the internet. It is updated monthly after meetings of the Formulary Committee when the status of new medicines is agreed.

Within Lothian University Hospitals Division, reports on compliance with the formulary are presented regularly to the Divisional Management Team, the Drug Utilisation Review Group (a subgroup of the Division's Drugs and Therapeutics Committee), and the clinical directorate teams.

Good practice example 2
North Glasgow University Hospitals Division (NGUHD)

NGUHD has introduced a range of initiatives aimed at promoting appropriate and cost-effective prescribing, and reducing the increase in expenditure on medicines. These include:

- A 'no form, no supply' formulary management policy which targets a number of named non-formulary medicines that are commonly prescribed, high-cost/low-volume medicines, restricted formulary medicines and new medicines not approved by the ADTC. The list of target medicines is updated after each ADTC meeting. This policy was initially developed at NGUHD and has been rolled out across NHS Greater Glasgow.

- The Prescribing Costs Control Team (PCCT) reports to NGUHD Management Team. It focuses on areas of high medicine spending identified through reports from finance and pharmacy, aiming to identify areas for cost saving.

- The Antimicrobial Utilisation and Control Sub-Committee has developed a range of antibiotic prescribing guidelines and protocols, and the Division funded antibiotic pharmacists to promote use of the guidelines and carry out audits. This work has resulted in cost savings and reduced inappropriate use of antibiotics.

NGUHD has seen a reduction in the rate of growth in expenditure on medicines in some areas. The increase in spending on medicines in 2003/04 was 7%, compared with 22% in 2002/03.

In addition to these initiatives, NHS Greater Glasgow established a Prescribing Management Group in February 2004 with a remit to improve the cost-effectiveness of prescribing.

NHS boards should also review the effectiveness and cost-effectiveness of medicines included in the joint formulary on a regular basis (Good practice examples 1 and 2).

Recommendations

NHS boards should:

- identify medicines where there is potential to move to cost-effective prescribing

- develop joint formularies and treatment protocols that promote cost-effective prescribing, and monitor their use.

Planning and budgeting need to improve

National bodies have a role in providing information to NHS boards to improve planning and monitoring

21. Scotland has three national bodies that provide information on medicines: SMC, NHS Quality Improvement Scotland (NHS QIS), which includes the Scottish Intercollegiate Guidelines Network (SIGN), and the Medicines Utilisation Unit (MUU). Exhibit 3 (overleaf) shows the roles and responsibilities of the bodies.

22. NHS boards need robust information about new medicines and their anticipated financial impact to help them plan and set budgets. Horizon scanning describes the process of identifying new medicines and new uses of existing medicines. The SEHD is committed to developing horizon scanning further to help NHS boards' planning.[8] The SMC/NHS QIS produced proposals to improve horizon scanning, and identified the need for central pharmaceutical, public health and finance resources to develop this. The SEHD is providing permanent funding of £114,000 per year for this development from April 2006.

23. The SMC reviews all new medicines close to the date when they are launched onto the market, providing Scottish guidance at an early stage. The SMC considers how a new medicine compares to any alternatives as part of its evaluation. This is based on information provided by the pharmaceutical companies from clinical trials and does not always provide full budget impact information such as staff costs or new ways of working. NHS boards also need information about the clinical and cost-effectiveness of new medicines as they are introduced into routine use. This work should be coordinated on a national basis to share the costs and make the most of the data set, perhaps led by the MUU, working closely with the National Clinical Dataset Development Programme (NCDDP)[9] at ISD and with other national bodies.

24. The National Institute for Health and Clinical Excellence (NICE) in England reviews a smaller number of medicines at a later stage, after they have been used for some time, and issues technology appraisal guidance (appraisals),[10] drawing on both clinical trial data and experience of using the medicines in practice. NHS QIS reviews the NICE appraisals and issues comment on these for NHSScotland. NHS QIS also produces its own health technology assessments (HTAs) which may relate to medicines. These are complementary processes and SMC, NHS QIS and NICE should work together to ensure that NHS boards receive up-to-date and consistent advice on medicines. Appraisals from NICE include a cost impact analysis. Separately from NICE appraisals, information on the potential budget impact of future NICE clinical guidelines is available from the UK-wide resource UK Medicine Information Prescribing Outlook.

25. SIGN guidelines cover a range of interventions and some include reference to medicines. They do not comment on the cost-effectiveness of treatments or include an estimate of the budget impact: they include comment on the resource implications only if these are significant. We have previously recommended that SIGN guidelines should include an assessment of the cost impact for Scotland to allow NHS boards to plan for their implementation.[11] We also recommend that they consider the cost-effectiveness of medicines. This would avoid potential inconsistency between SIGN guidelines and the conclusions from other bodies that already consider cost-effectiveness.

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8   *A strengthened role for the Scottish Medicines Consortium (SMC)*, HDL(2003)60, SEHD, November 2003.
9   This programme aims to develop a set of standardised clinical datasets across NHSScotland as part of the e-Health Programme. The MUU will provide data to allow this to happen.
10 Technology appraisal and health technology assessment refer to evaluations of any intervention used to promote health, including medicines (see glossary page 48).
11 *Supporting prescribing in general practice – a progress report*, Audit Scotland, June 2003.

Exhibit 3
National organisations that provide information on the use of medicines

NHS boards get information from, and have to take account of, guidance from a number of different bodies.

SEHD

NHS QIS:

- Special health board.

- Develops national standards.

- Reviews NHS bodies against national standards.

- Produces, reviews and updates national SIGN guidelines.

- Issues Best Practice statements.

- Undertakes health technology assessment.

- Issues NICE Technology Appraisal Guidance in Scotland.

- Issues National Patient Safety Agency (NPSA) guidance to NHSScotland.

National Services Scotland (NSS):

- National agency.

- Delivers national and regional services, including data analysis and monitoring standards.

SMC:

- Independent organisation supported by NHS QIS.

- Advises on the clinical and cost-effectiveness of new medicines and new uses for existing medicines.

- Will undertake horizon scanning.

MUU:

- Established as part of NSS in January 2005.

- Still developing its work programme.

- Aims to provide readily accessible information on the use of medicines across the NHS in Scotland to inform policy development, planning and service delivery.

Source: Audit Scotland

Recommendations

- The SMC should continue to develop its work on estimating the anticipated budget impact of new medicines so that NHS boards are provided with information on all anticipated costs and cost savings. NHS boards need this information to estimate the local financial impact of new medicines.

- SIGN guidelines should consider the cost-effectiveness of medicines when developing clinical guidelines.

- SIGN guidelines, NICE appraisals reviewed by NHS QIS and NHS QIS HTAs that relate to medicines should include an assessment of the budget impact for NHSScotland.

- The MUU should work with the NCDDP at ISD, NHS QIS, SMC and ADTCs to develop a coordinated approach to collating data on medicines utilisation that can be used to review the effectiveness and cost-effectiveness of medicines.

Hospital medicines budgets are still based on historical levels in many NHS boards

26. When setting budgets for medicines, NHS boards need to take account of horizon scanning information on likely pressures, and data on present patterns of use. This is not happening well in many areas and medicines budgets are largely based on historical levels; over half of NHS boards identified pressures on their medicines budgets. Money has to follow this planning process if NHS boards are going to be able to manage pressures on medicines budgets. A horizon scanning process has been developed to some extent in eight of the 12 mainland NHS boards, but only six are using this information as part of the formal process to set medicines budgets (Good practice example 3 overleaf).

27. In ten NHS boards groups such as the ADTC, the Medicines Resource Group, and pharmacy managers working with clinicians and planning managers, provide advice on the future budget for medicines. These groups and individuals have an overview of medicines issues, including appropriate prescribing, monitoring and budget setting. The Regional Cancer Advisory Groups (RCAGs) and the Glasgow Drugs in Oncology Group are actively involved in horizon scanning, estimating future pressures and advising NHS boards.

28. All NHS boards have systems in place to respond to guidance from the SMC. Local decisions generally reflect national guidance, although access to medicines that the SMC has recommended for use and not designated as unique may vary across NHS boards.[12] This is appropriate if it is in line with local needs, priorities and clinical expertise.

29. All NHS boards have developed a board-wide approach to managing the implementation of new medicines through the ADTC, Prescribing Management Group or equivalent.

Each ADTC is represented on the SMC, so all NHS boards should be aware of recommendations and issues at an early stage. Regional planning is developing for some specialties, particularly cancer services through the RCAGs. These groups support board planning.

30. There is not the same planning for new clinical guidelines and HTA guidance. Any changes in the use of medicines recommended in these are often expected to be funded through the existing medicines budget. NHS Ayrshire & Arran is the only board we are aware of that has set aside a specific contingency fund to meet the cost to the hospital service of changes in medicines used following new clinical guidelines.

31. NHS Argyll & Clyde and NHS Highland have introduced combined medicines budgets across hospital and primary care services. A number of other boards have made progress in joint working and area-wide management of new medicines, such as having a group with representatives from hospital and primary care advising on how to allocate the budget.

32. Clinicians are more likely to promote cost-effective prescribing if they are involved in setting and managing budgets. Clinical pharmacists, who work with prescribers on wards as part of the multidisciplinary team, should also be involved in this process. Budget-holders should be in a position to influence prescribing behaviour. In 14 NHS bodies, the budget for medicines is devolved to directorate or clinical team level, mostly to the general manager or the clinical director.

12 A unique medicine is defined as a medicine which offers substantial health gain for patients in Scotland with a disease or condition for which there was previously no treatment. Proposed definition, Dr K Paterson, SMC, personal communication, May 2005.

Good practice example 3
NHS Highland

NHS Highland increased the hospital medicines budget significantly in 2004/05 in an attempt to bring it to a balanced budget state and meet identified shortfalls. The revised medicines budget was informed by considerable horizon scanning and bottom up budget-setting. The directorates were involved in horizon scanning and in identifying the appropriate budget. This draft budget figure was considered along with all of NHS Highland's other draft budgets. At that stage, the proposed budget was reduced slightly to arrive at an overall budget for the board that was within total funding.

33. NHS boards should consider allocating the budget for medicines to services on an area-wide basis, for example through managed clinical networks (MCNs), although at present these cover a small number of specialties only. This has the potential to further increase coordination between hospitals and primary care, remove the gap between prescribers and the budget-holder, and put management of budgets at local level. Such an approach would need clear lines of accountability between MCNs and the NHS boards, operating divisions and the new community health partnerships.

Recommendations

NHS boards should:

- ensure that horizon scanning information and monitoring information on the use of medicines is used to inform budgets for medicines

- ensure that the medicines budget-holder has credibility and influence with prescribers

- involve lead clinicians and lead clinical pharmacists in signing off the medicines budget.

Part 3. Support for prescribers

Main findings

- Not all NHS boards have a broad range of guidance on good practice that prescribers need. There are opportunities for NHS boards and the SEHD to build on existing good practice and promote a more consistent approach across Scotland.

- NHS boards often have guidance but do not have the infrastructure to make sure it is being applied in practice. Many do not provide education and training to raise awareness and promote use of the guidance, and do not have monitoring to review compliance.

- NHS boards have put a lot of work into developing systems to report and learn from mistakes. The NHS in Scotland would increase the benefit of this work by adopting a national approach.

The increasing range of medicines available and the growing number of people involved in prescribing means that prescribers need easy access to guidance and advice

34. New medicines are being developed all the time and many of these mean more treatment options for patients. At the same time, the number of prescribers is increasing: independent prescribing for hospital nurses was introduced in 2002, supplementary prescribing by nurses and pharmacists was introduced in 2003[13] and supplementary prescribing by Allied Health Professionals in 2005. Consultation is currently taking place on proposals to introduce independent prescribing by pharmacists throughout the UK.

Access to guidance

NHS boards need to take account of national guidance and guidelines

35. NHS boards need to make sure that medicines that the SMC accepts for use in NHSScotland are available to meet clinical needs in line with local needs, priorities and clinical expertise. If the SMC classes a new medicine as 'unique', then all boards must make it available within three months of the SMC releasing the decision, working to a national implementation plan and treatment protocol developed and agreed by the SMC.[14] There has only been one example of this since the SEHD issued this clear direction: etanercept for the treatment of psoriatic arthritis.

36. Local prescribing advice should reflect national clinical guidelines, NICE appraisals, NHS QIS HTAs and conclusions from the SMC. For example, a local joint formulary should be updated to reflect medicines

13 Supplementary prescribing is defined as a voluntary partnership between an independent prescriber (a doctor) and a supplementary prescriber, to implement an agreed patient-specific Clinical Management Plan. Independent prescribing means that the individual has full prescribing rights. Nurses can only prescribe medicines from a limited list.
14 *A strengthened role for the Scottish Medicines Consortium (SMC)*, HDL(2003)60, SEHD, November 2003.

Good practice example 4
Fife Acute Hospitals

The NHS Fife Clinical Governance Steering Group coordinates dissemination and review of national guidelines. A standard template is used to review guidelines in the Acute Division. This includes a box that should be ticked to indicate if the guideline may have an impact on guidance included in the joint formulary. The steering group would then share this information with the ADTC. In addition, the chief pharmacist is a member of the steering group. The steering group forwards national guidelines to the ADTC Formulary Subgroup which then decides if they need to review the relevant section of the formulary immediately or if it can wait until the annual review.

Good practice example 5
NHS Argyll & Clyde

NHS Argyll & Clyde has developed a searchable database that includes information about new medicines and local decisions on the status of new medicines. This is kept up to date and it is available to NHS Argyll & Clyde staff on the ADTC intranet site as a useful reference.

accepted for use by the SMC and to reflect SIGN guidelines. Nine NHS bodies have no formal link between the processes for implementing SIGN guidelines and NICE appraisals, and the process for updating local prescribing advice for medicines accepted for use by the SMC. Five of these have informal links and four have none. NHS boards need these links to ensure consistency between national guidance and local advice on medicines (Good practice example 4).

37. All boards have an area-wide approach to dealing with conclusions from the SMC, but eight have separate arrangements for dealing with national guidelines, NICE appraisals and NHS QIS HTAs in hospitals and in primary care. This means possible inconsistency with different decisions being made in hospital and primary care.

38. Prescribers are informed about the use of new medicines mostly through local bulletins produced after ADTC meetings. Information is always sent or emailed to consultants and pharmacists, but there is not such a clear process for junior doctors and nurses in many NHS bodies.

In two NHS bodies, junior doctors identified pharmaceutical company representatives as their main source of information on new medicines. Without updates on new medicines, prescribers do not have information on medicines that may improve their prescribing. They may also prescribe new medicines that have not been recommended for use locally (Good practice example 5).

Recommendations

NHS boards should:

- ensure there is coordination between the processes for implementing national clinical guidelines, NICE appraisals, NHS QIS HTAs and advice from the SMC

- consider developing area-wide arrangements for dealing with clinical guidelines, NICE appraisals and NHS QIS HTAs to ensure a consistent approach between hospitals and primary care.

NHS boards need to ensure that staff have access to local policies
39. All NHS boards should have a number of key documents to inform prescribing decisions by staff.

Joint prescribing formularies inform prescribing choices
40. As outlined in Part 2 (page 6), joint formularies can encourage cost-effective prescribing. They provide prescribers with information on the medicines recommended for use locally. Of the eight mainland boards with a joint formulary, only two operating divisions regularly monitor whether prescribing is in line with the joint formulary. Three NHS boards monitor it annually.

41. Most joint formularies do not include all medicines that hospital specialists may need to use and so some non-formulary prescribing is appropriate. In addition to the formulary, NHS boards should develop a list of recommended specialist medicines to provide further advice and a basis for monitoring.

42. Most NHS boards put resources into developing and updating joint formularies, but most have not put specific resources into implementing them. Around half of NHS bodies have staff employed to develop, update and disseminate the joint formulary. The level of resource ranges from 0.1 to 1.3 whole-time equivalent (WTE) staff, mainly pharmacists. Most staff that we spoke to in hospitals are aware of the joint formulary, but many did not use it for reference themselves, other than the clinical pharmacists. Clinical pharmacists are asked for advice by other staff, giving them an opportunity to raise awareness, and increase use, of the formulary, but they are not always available as a source of advice and have other calls on their time.

43. It is important that NHS bodies continue to make local decisions on the content of local joint formularies to ensure local involvement and support. But NHS boards should work together to develop a national framework to guide the process for developing local joint formularies. A national framework would increase consistency across NHSScotland, reduce duplication of effort and allow local resources to focus more on raising awareness and encouraging use of the joint formulary, and monitoring compliance. There are examples of this happening in practice: NHS Lanarkshire has adapted the structures of the Lothian Joint Formulary to develop one of its own. NHS boards could also use a national template for communicating updates to the local joint formulary.

Recommendations

NHS boards should:

- raise awareness of the joint formulary and encourage staff to use it

- consider developing a national framework to guide the process for developing local joint formularies.

Overuse of antibiotics can be reduced by antibiotic prescribing strategies, education and monitoring

44. NHS boards should have an antibiotic prescribing policy, setting out which antibiotics are recommended to treat which infections and for how long. It should also include an 'intravenous (IV) to oral' switch policy outlining best practice in the use of IV antibiotics and when it is recommended to switch to an oral product. Twelve NHS bodies have specific antibiotic policies and a further two are in the process of developing policies. Six have IV to oral switch policies.

45. The national pharmaceutical strategy states that there should be regular reviews of antibiotic prescribing within each ward or clinical unit.[15] The SMC is producing national guidance on the use of antibiotics on behalf of the SEHD. Only two NHS bodies have an audit plan and regular clinical audits against the policies. Six more have ad hoc audits. Monitoring the use of antibiotics requires significant staff time since this

information is not available from electronic systems and has to be extracted manually from case notes. Pharmacy systems have data on how much of each antibiotic is used, but not what it was used for and whether this is in line with best practice.

46. In England, the Department of Health (DoH) has put £12 million over three years into pharmacy initiatives to promote best practice in the use of antibiotics in hospitals.[16] The DoH's Medicines Management Framework recommends that NHS trusts nominate a lead pharmacist for antibiotic prescribing who is responsible for ensuring that appropriate policies are in place.[17] There is some evidence of benefits from this, including appropriate choice of medicines and reduced length of stay in hospital.[18] Five NHS bodies[19] in mainland Scotland have antibiotic pharmacists or antibiotic prescribing officers. Their remit mostly includes education, raising awareness and monitoring. In most cases, these specialists are only able to carry out limited monitoring, looking at local priorities. North Glasgow University Hospitals Division and Tayside Acute Services Division have attributed a reduction in expenditure on antibiotics to the work of these specialists (Good practice example 6 overleaf).

Recommendation

- NHS boards should develop antibiotic prescribing strategies and put in place mechanisms to support these strategies, including education, clinical audit and feedback to staff.

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15 *The Right Medicine – A strategy for pharmaceutical care in Scotland,* SEHD, 2002.
16 *Hospital pharmacy initiative for promoting prudent use of antibiotics in hospitals*, Professional letter, PLCMO (2003) 3, Chief Medical Officer, Department of Health.
17 *Medicines management in NHS trusts: Hospital medicines management framework*, DoH, 2003.
18 *The expanding role of the antibiotic pharmacist*, Weller TMA and Jamieson CE, JAC. 2004 54(2): 295-298.
19 Ayrshire & Arran Hospitals, Forth Valley Acute Hospitals, North Glasgow University Hospitals, Lanarkshire Acute Hospitals, Tayside University Hospitals.

Good practice example 6
Tayside Acute Services Division

Tayside University Hospitals NHS Trust introduced a policy for appropriate use of a small number of named antibiotics (ALERT antibiotics) in a sample of wards at Ninewells Hospital in August 2000. The policy aims to reduce inappropriate prescribing of key antibiotics that should not be used unless other antibiotics have not been successful. The implementation strategy is through clinical pharmacists providing immediate feedback to prescribers while their patient is still being treated. This intervention was associated with significant decreases in total use and cost of antibiotics in the two years after the programme was implemented. An antibiotics coordinator was appointed in 2004 and is working with the clinical pharmacists, auditing use of these antibiotics and the reasons why they are still used inappropriately. The antibiotics coordinator produces regular reports for an ADTC subgroup which discusses the findings with the clinical services.

Most NHS boards do not have formal policies on the use of unlicensed medicines and medicines used off-label

47. Some medicines used in hospitals are unlicensed; that is, they do not have marketing authorisation from the Medicines and Healthcare products Regulatory Agency (MHRA), usually because the pharmaceutical company did not carry out the clinical trials required for financial or ethical reasons. These are generally specialist medicines used to treat small numbers of patients where there is no alternative licensed medicine, or where the licensed medicine has not been successful and the unlicensed medicine may offer a benefit.

48. Some medicines are used off-label; that is they are used in a way that is not included in the marketing authorisation, such as for a different clinical condition or in a different dose. For example, a number of medicines used to treat children are only licensed for use in adults. There are ethical difficulties in carrying out clinical trials involving children, and medicines tend to be used for children only after there is significant experience of using them to treat adults. National guidance is available.[20] As with unlicensed medicines, off-label medicines are used in very specific circumstances. The EU is consulting on a directive on children's medicines which will require pharmaceutical companies to carry out clinical trials in children before a product is licensed unless the product will not be used for children, such as treatments for Alzheimer's disease.[21] This will increase the numbers of medicines licensed for children in the future.

49. NHS bodies need to ensure that unlicenced and off-label medicines are used appropriately. Prescribers have a professional responsibility to be aware of the licensed status of the medicines they prescribe. They need to be aware that they are using an unlicensed or off-label medicine and be clear that this is the correct decision. NHS bodies should support them by making sure this information is readily available. The use of unlicensed medicines needs to be recorded.

50. It is difficult for NHS boards and hospitals to monitor medicines used off-label, as pharmacy systems only identify that the medicine has been used, not the condition it has been used to treat. Off-label medicines are licensed for some conditions, and routine data cannot identify if they were used for a licensed or unlicensed condition.

51. This is a complex issue and some NHS boards are putting significant work into developing policies on unlicensed and off-label medicines. NHS Greater Glasgow, NHS Lothian, NHS Tayside and NHS Ayrshire & Arran have developed board-wide policies on using these medicines, while NHS Argyll & Clyde has different policies in the different former trusts. NHS Forth Valley and NHS Highland are developing policies.

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20 *Medicines for Children*, Royal College of Paediatrics and Child Health.
21 *Commission consultation on a draft proposal for a European Parliament and Council Regulation (EC) on medicinal products for paediatric use*, European Commission, 2004.

The other five mainland boards have informal unwritten policies only or no policies. The approaches being developed vary and none has been fully tested in practice.

Recommendation

• The SEHD should establish a national working party to develop good practice in the use of unlicensed and off-label medicines.

Availability of policies

52. Some of the key policies are not available to all staff (Exhibit 4 overleaf). To be used routinely, guidance needs to be available at the point of prescribing. All boards with a joint formulary have an electronic version that is updated more frequently than the paper version. But the infrastructure is not in place to encourage staff to access electronic information at the point of prescribing.

53. Ward staff often have limited access to computers, which makes it difficult for them to access electronic information, particularly when writing a prescription. This means there is no system to guide prescribers at the point of prescribing, other than paper references. Some hospitals are piloting the use of pocket-sized electronic Personal Digital Assistants (PDAs). Prescribers can have the PDA with them at all times and can use it to access a range of information, including the local joint formulary and treatment protocols. A further difficulty is that while the most up-to-date information is available in electronic format, paper prescriptions are used in all hospitals, except Ayr Hospital which has an electronic prescribing system.

Access to medicines information services

54. Medicines Information (MI) Pharmacists provide staff with advice and information about medicines, through bulletins and answering enquiries. Some also provide a helpline for patients. In many NHS boards this service is centralised. Comparing the number of MI staff with the number of inpatient beds in a board area gives a crude estimate of the level of resource available to provide this advice (Exhibit 5, page 19). The SEHD is reviewing the future provision of services.[22]

Recommendation

• NHS boards should ensure that staff have up-to-date information on national and local guidance and policies, that they have easy access to this information and are encouraged to use it.

The NHS in Scotland could do more to learn from medication errors

55. The complexity and increasing number of medicines, together with paper-based information systems, raise the risk of staff making mistakes. Hospitals and NHS boards need systems to record any mistakes or near misses so that managers and staff can learn from them and take action to avoid them happening again. There are no national data on the number of medication incidents (mistakes or near misses) in hospitals in Scotland or the UK. Studies suggest that 6-9% of patients admitted to hospital in the UK experience a medication incident.[23][24] The cost to the NHS in Scotland has been estimated as £50 million per year.[24]

56. All NHS bodies have implemented one of a number of different systems to record adverse incidents. Seven NHS bodies have groups that review and manage medication incidents specifically, in addition to overall clinical governance and risk management arrangements. These are generally subgroups of the hospital Drugs and Therapeutics Committees, and their work mostly involves examining incident or summary reports.

57. Six NHS bodies do not have well-developed systems for ensuring that actions take place following an incident and for sharing learning from incidents with staff. Nine NHS bodies have no system to ensure that clinical pharmacists at ward level get information about medication incidents. This is a concern as they have a key role in investigating the root cause and advising staff and managers on corrective action [Good practice example 7, page 19).

58. Scotland has no national system to record adverse clinical incidents, including medication incidents. In England and Wales the NPSA has been developing a national incident recording system since 2001. Staff report incidents anonymously through an electronic reporting system accessed on NHSNet. Individual strategic health authorities and trusts are responsible for investigating, managing and acting on incidents. The national system provides a larger dataset, allowing improved analysis of trends to identify the need for actions. The NPSA supports action at a national level, such as issuing alerts and advice. These are circulated in Scotland by NHS QIS.

22 *The Right Medicine – A strategy for pharmaceutical care in Scotland*, SEHD, 2002.
23 Press Release, National Patient Safety Agency, January 2004.
24 *A report on Hospital Electronic Prescribing and Medication Administration*, (HEPMA), draft report commissioned by the Chief Pharmaceutical Officer. Issued for consultation by the SEHD, 13 May 2004.

Exhibit 4
Local policies and documents available to prescribers

Most NHS bodies have policies in place but do not monitor against them.

| NHS body	Joint formulary in place	Monitoring against joint formulary	Antibiotic policy in place	Audit against antibiotic policy	Policy on unlicensed and off-label medicines
T1	Yes	Developing	Yes	Yes	Yes
T2	Yes	Yes	Yes	Limited	Yes
T3	Yes	No	Yes	No	Yes
T4	Yes	Yes	Yes	Limited	Yes
T5	Yes	No	Yes	Limited	No
T6	Yes	No	Developing	No	Developing
DG7	Planned	No	Yes	No	No
DG8	Planned	No	Yes	No	Developing
DG9	Yes	Yes	Yes	Yes	Developing
DG10	Yes	Yes	Yes	Limited	No
DG11	Yes	No	Yes	No	Yes
B12	Developing	No	No	No	No
B13	Planned	No	Yes	Limited	No
B14	Yes	Planned	Yes	Limited	Yes
B15	Yes	Yes	Developing	No	Yes

Note: T=Teaching hospitals operating division. DG=District general hospitals operating division. B=Integrated board.

Source: Audit Scotland fieldwork, November 2003-September 2004

Exhibit 5
MI pharmacists available

The level of medicines information resource in each NHS board varies.
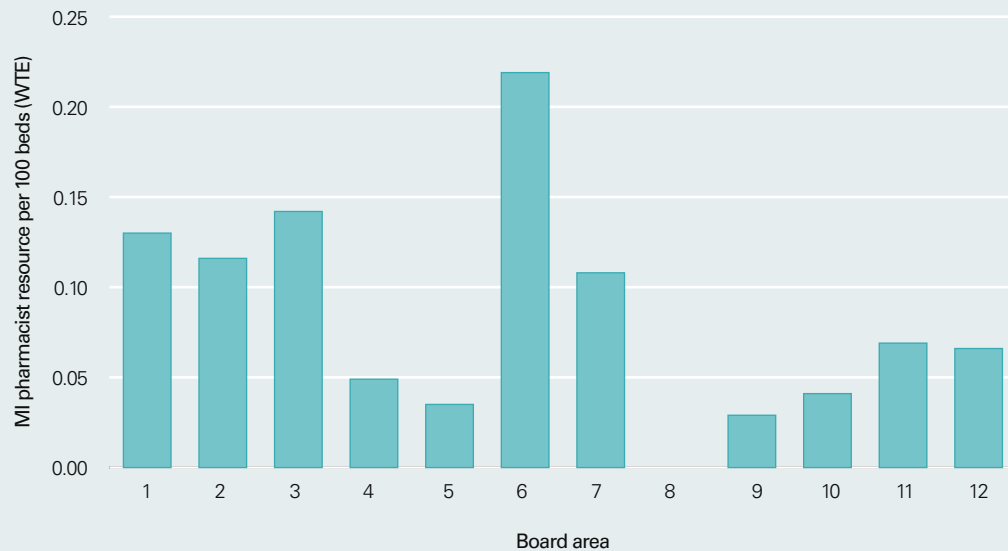
Note: We only have data on the number of hospital beds and the medicines information staffing managed by the acute hospital service in area six. Area eight has made alternative arrangements to cover this role.

Source: Audit Scotland survey, September 2003

Good practice example 7
NHS Tayside, Yorkhill Division, NHS Grampian Acute Sector

Tayside has developed risk management using the SMART software system developed locally. Incident reporting feeds into the SMART system, using an electronic reporting facility. A medication incident reporting system has been developed and incorporated into the electronic reporting system. A drop-down menu on the electronic incident reporting form links to further screens that collect more detailed information about a medication incident. This more detailed reporting will improve trend analysis and learning.

Yorkhill Division of NHS Greater Glasgow has had a system for reporting medication errors in place for many years. This is managed by pharmacy and provides detailed information about errors. The pharmacy manager prepares quarterly reports on all incidents and these are disseminated widely.

NHS Grampian Acute Sector has been proactive in encouraging staff to report medication incidents and in sharing learning from incidents. Actions taken include running education sessions and producing a quarterly medication safety newsletter. The Medication Safety Committee emails this to all wards and departments.

59. In 2003, NHS QIS was appointed as the lead agency for coordinating work on patient safety and incident reporting in Scotland. As a preliminary stage, NHS QIS has focused attention on updating the generic clinical governance standards following the merger of the national CNORIS risk management standards and the NHS QIS generic clinical governance standards. These standards include incident reporting and are due to be published later in 2005. NHS QIS is currently carrying out research into the incident reporting systems in use in NHS organisations. This is due to report in Autumn 2005 when a decision will be made on the most appropriate and effective national approach. It is expected that any national approach will use the data collected through the local systems. NHS QIS is also considering how best to work with NPSA and learn from its experience. This is welcome, but there is a significant cost attached to developing and implementing a range of different local reporting systems without national coordination.

Recommendations

- NHS QIS should develop a national approach to collecting data on adverse incidents, including medication incidents, to allow robust trend analysis, transferable lessons and benchmarking.

- NHS boards should ensure they have robust processes to review medication incidents and take action to prevent a repeat.

- NHS boards should ensure that staff get regular information about medication incidents and the learning points from them.

NHS boards need to do more to report adverse reactions to medicines

60. People can have adverse reactions to medicines, not because of mistakes, but because of potential side-effects that have already been identified or which were previously unknown. These need to be monitored to identify any trends, particularly when medicines have recently been launched for use. Research studies suggest that about 7% of patients admitted to hospital in the UK are suffering from an adverse reaction to a medicine.[25] The annual cost to the NHS in the UK of these hospital admissions has been estimated as £466 million.[26]

61. The Committee on Safety of Medicines (CSM) monitors adverse reactions on a UK-wide basis. A voluntary reporting scheme is in place and staff have a professional responsibility to report adverse reactions to CSM through the Yellow Card scheme. There were 696 Yellow Card reports from Scottish hospitals in 2003 and 467 in the first six months of 2004.[27] The rate of reporting varies widely across NHS boards.

62. However, there is widespread belief that many adverse reactions are not reported. Following publication of the national pharmaceutical strategy for Scotland,[28] CSM Scotland was established in 2003 to administer the scheme in Scotland and to raise awareness through a range of education and training initiatives.

63. In 11 of the 15 NHS bodies no individual, group or committee has responsibility for raising awareness of the national reporting scheme or for providing staff with education and advice on what and how to report. Nurses and midwives have been able to use the Yellow Card scheme since 2003, but nursing staff in most hospitals were unaware of the scheme (Good practice examples 8 and 9).

Recommendation

- NHS boards should ensure that staff are made aware of the need to report adverse reactions to medicines and should monitor the level of reporting, using reports from CSM Scotland.

25 *Adverse drug reactions in hospital patients*, Wiffen P, Gill M, Edwards J, Moore A, Bandolier, 1 June 2002.
26 *Adverse drug reactions as cause of admission to hospital: prospective analysis of 18,820 patients*, Pirmohamed M, James S, Meakin S, et al, BMJ 2004; 329: 15-19.
27 CSM Scotland, personal communication, November 2004.
28 *The Right Medicine – A strategy for pharmaceutical care in Scotland*, SEHD, 2002.

Good practice example 8
Lanarkshire Acute Hospitals Division

Lanarkshire Acute Hospitals Division has developed its own electronic in-house incident reporting system. This includes a prompt to remind staff to complete a Yellow Card and report it to CSM Scotland if they are reporting an adverse reaction to a medicine.

Good practice example 9
Edinburgh Cancer Centre (ECC), Lothian University Hospitals Division

ECC has developed and introduced a standard operating procedure (SOP) on completing a Yellow Card to report an adverse reaction to a medicine. All pharmacists working within the oncology directorate are trained to use it. There was an 800% increase in Yellow Card reports submitted by pharmacists in ECC between 2002 and 2003.

Part 4. Changing the delivery of care

Main findings

- Prescribers, particularly new prescribers, need advice and guidance on the appropriate and cost-effective use of medicines. Pharmacists have this expert knowledge and are increasingly working with prescribers and patients, but not all hospitals and specialties have sufficient access to pharmacists in wards and clinics.

- National workforce planning is not yet in place for pharmacy staff. Many NHS boards have vacant posts and difficulty recruiting and retaining pharmacy staff.

- Hospital staff are concerned that education for medical students does not give them the knowledge of medicines they need when they start prescribing.

- NHS boards need senior management level awareness of the wide range of issues that contribute to best practice in the use of medicines. Pharmacy managers have that overview but most are not represented on key decision-making groups at boards and operating divisions.

Pharmacists are increasingly working as part of multidisciplinary teams

64. It is challenging for prescribers to maintain a comprehensive knowledge of medicines and best practice. Staff need advice from people with this expert knowledge such as pharmacists and, where they are available, clinical pharmacologists.

65. The role of the pharmacist is more than dispensing medicines. A clinical pharmacist's role includes:

- working with patients to get a medication history, including any allergies and contraindications

- advising prescribers on the most appropriate and safe use of medicines

- educating and counselling patients about using their medicines

- reviewing how medicines are working

- checking medicines prescribed on discharge from hospital

- communicating with the GP, district nurse, community pharmacist and others who will be involved in caring for the patient at home or in a care home.

66. Some pharmacists have also been trained as supplementary prescribers and consultation is taking place on proposals to introduce independent prescribing for pharmacists.

The national strategy for pharmaceutical care recommends improvements in how medicines are supplied in hospitals

67. The national strategy for pharmaceutical care stresses the importance of changing the ways that medicines are supplied in hospital, ensuring that all patients receive care from a clinical pharmacist and extending clinical pharmacy roles. This includes working with patients at outpatient clinics, pre-admission clinics and during their stay in hospital, particularly at the time of admission and discharge. All NHS boards have plans to implement the strategy and have made progress.

68. In 2002, the SEHD requested that NHS boards allocate funding of £4 million to support implementation of *The Right Medicine* each year for three years. This was not new money; boards were expected to reallocate savings on medicines in primary care as a result of the generic drugs discounts survey. But some boards had already allocated the generic drugs discount savings elsewhere for 2002/03 as part of their financial planning. Eight mainland boards were able to make available the full funding allocation identified by the SEHD, and two more boards made it available at a later stage. The other two boards released some funding but not the full amount. One board put the funding into primary care developments only. All other boards put funding into both primary care and hospital services, in hospitals mostly to fund staff posts and bedside medicine lockers.

All NHS boards are changing the way that medicines are supplied in hospitals, although the rate of progress varies

69. The national strategy recommends three main changes in the way medicines are supplied:

- Using patients' own medicines.

- Providing patients with their own original pack of any medicines that are required on admission, which they take home on discharge if needed.

- Implementing schemes to allow patients to administer their own medicines (Exhibit 6 overleaf).

70. NHS boards' progress in taking forward these three main changes is variable and, in some areas, very limited (Exhibit 7, page 25). It is unlikely that the timescales specified in *The Right Medicine* will be met in all NHS bodies. However, there has been significant progress in implementing new ways of supplying medicines in NHS Borders, Forth Valley Acute Hospitals Operating Division, NHS Grampian Acute Sector and Lothian University Hospitals Division.

71. Three NHS bodies have not implemented patient pack dispensing at all, and also do not dispense original packs on discharge. Providing patients with medicines without the manufacturer's Patient Information Leaflet (PIL) breaks EU legislation, exposing the NHS boards to the risk of legal action.

72. NHS Education Scotland (NES) and the SEHD plan to work with NHS staff to develop a national support pack for self-medication administration schemes which will be issued by NES. This is the least well developed of the changes recommended by the national strategy.

73. The main factors identified by NHS boards as supporting implementation of the strategy are:

- evidence of the benefits to patients and to services

- funding

- area-wide action.

74. Some NHS bodies identified local issues that supported progress with changing the ways medicines are supplied:

- Lothian University Hospitals Division took advantage of the move to a new hospital site at the new Royal Infirmary of Edinburgh to change the way that medicines are supplied from the outset.

- NHS Grampian had already changed to new ways of working prior to *The Right Medicine* and was able to use some of the identified funding to pump prime further development.

- NHS Forth Valley had also started to implement changes prior to *The Right Medicine*. Funding was used to fund staff posts, mostly pharmacy technicians.

- NHS Borders had already identified the actions in *The Right Medicine* as areas they would like to progress. The pharmacy manager stressed the need to comply with EU legislation by moving to original pack dispensing and this was taken forward as a risk management initiative.

- West Lothian Healthcare was an integrated trust covering hospital and primary care services prior to the move to single system working through unified health boards, making it easier to move funding between hospital and primary care services to support changes in the supply of medicines.

Exhibit 6
Actions from *The Right Medicine*

The Right Medicine has three actions to change how hospitals supply medicines.

| Action	Timescale	Advantages
Develop systems to allow, wherever possible, the dispensing of patient packs across primary, secondary and tertiary care.	December 2005	• Patients get their own original pack of the medicine (patient pack). These should be stored in a lockable bedside locker. This is normally a 28-day supply. • EU legislation requires hospitals to provide patients with the manufacturers' PIL.[29] These are available in original packs. • It reduces the possibility of the patient being given the wrong medicine from the trolley. • It reduces delays when the patient is discharged because the patient already has the medicine – if they are continuing to use the medicine, they take the remainder of the pack with them on discharge. • It avoids possible delays in the patient getting a supply of medicines through the GP when they return home.
Look to implement suitable self-medication administration schemes in hospitals.	December 2005	• Patients would have a patient pack stored in their own locker, with the advantages as above. • Most patients take their own medicines when they are at home. It is important that they are able to manage their own medicines. This is particularly important for elderly people, so that they do not lose the ability and confidence to manage their medicines while in hospital.
Develop models of practice to ensure that all patients have their medicines reviewed and medication problems addressed before discharge from hospital.	December 2004	• The pharmacist identifies any care issues and develops a plan to deal with them. • The pharmacist has an opportunity to make sure the patient understands their medicines and can use them to get most benefit.

Source: *The Right Medicine* and Audit Scotland

29 *EEC Directive (92/27/EEC).* This came into force in January 1999.

Exhibit 7

Implementation of changes in the supply of medicines in hospitals

Progress towards changing the way medicines are supplied is limited in most NHS bodies.
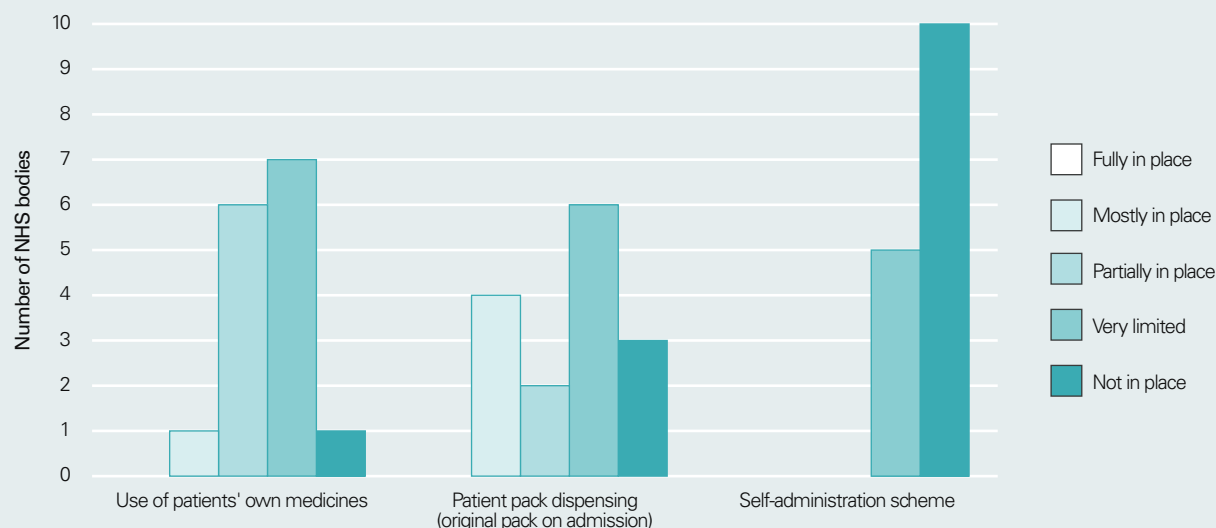
Source: Audit Scotland fieldwork, November 2003-September 2004

75. NHS bodies identified the following factors as difficulties with implementing the strategy:

- Recruitment of pharmacists and technicians.

- The need for additional funding to support initial and/or future redesign of services.

Recommendations

NHS boards should:

- ensure that implementation of the recommendations in *The Right Medicine* links with local pharmacy strategies

- address as a priority the need to supply patients with original packs of medicines that include the manufacturer's PIL, to reduce risks to the patient and to meet the requirements of

EU legislation. Original packs should be supplied on admission to meet the requirements of *The Right Medicine*.

Organisation of pharmacy services

Not all hospitals and specialties have a clinical pharmacy service

76. The national pharmaceutical strategy recommends that all patients should receive care from a clinical pharmacist,[30] but only two-thirds of hospitals have a clinical pharmacy service (Exhibit 8 overleaf). Clinical pharmacy services are least well developed in community hospitals and in long stay care of the elderly units.

77. In hospitals with a clinical pharmacy service, there are often gaps in the service. Eleven of the 15 NHS bodies identified wards that did not have a clinical pharmacy service, particularly in long stay care

of the elderly, surgical and maternity services. Exhibit 9 (overleaf) shows the specialties most likely to have an inpatient clinical pharmacy service among the hospitals in our survey.

78. In line with the national pharmaceutical strategy, some hospitals also provide a service at surgical pre-admission clinics and some provide a clinical pharmacy service for day patients and outpatient clinics (Exhibit 10, page 28). This is in place in high-risk specialties such as oncology, haematology, renal medicine and adult mental health services, where a large proportion of patients are treated as outpatients or day cases.

79. In addition to providing clinical pharmacy services in a wider range of settings, some hospitals also have pharmacists working in extended roles, particularly in outpatient clinics. Pharmacists have taken over some appropriate tasks from junior doctors on wards, such as medication

30 *The Right Medicine – A strategy for pharmaceutical care in Scotland*, SEHD, 2002.

Exhibit 8

Proportion of different types of hospital with a clinical pharmacy service

Clinical pharmacy services are most developed in acute and psychiatric hospitals.
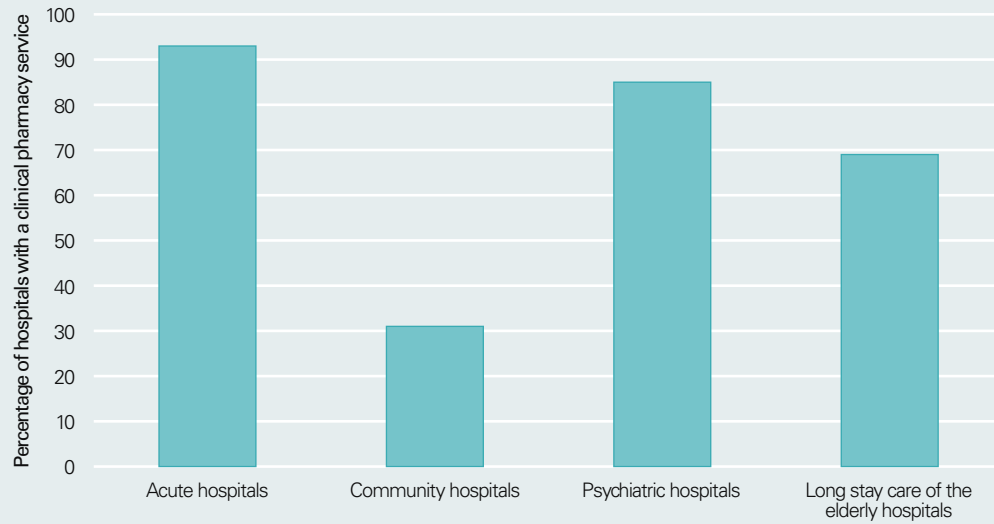
Source: Audit Scotland survey, September 2003

Exhibit 9

Percentage of hospitals with a clinical pharmacy service across a range of specialties

A range of specialties do not have a clinical pharmacy service in many hospitals.

Note: We have no comparable data on the number of hospitals providing oncology and palliative care, so they are not included in the chart.

Source: Audit Scotland survey, September 2003 & ISD

reviews, and are working as part of multidisciplinary teams. We found examples of good practice, including pharmacists consulting with patients in oncology clinics and diabetes clinics at Forth Valley Acute Hospitals Operating Division and Lothian University Hospitals Division.
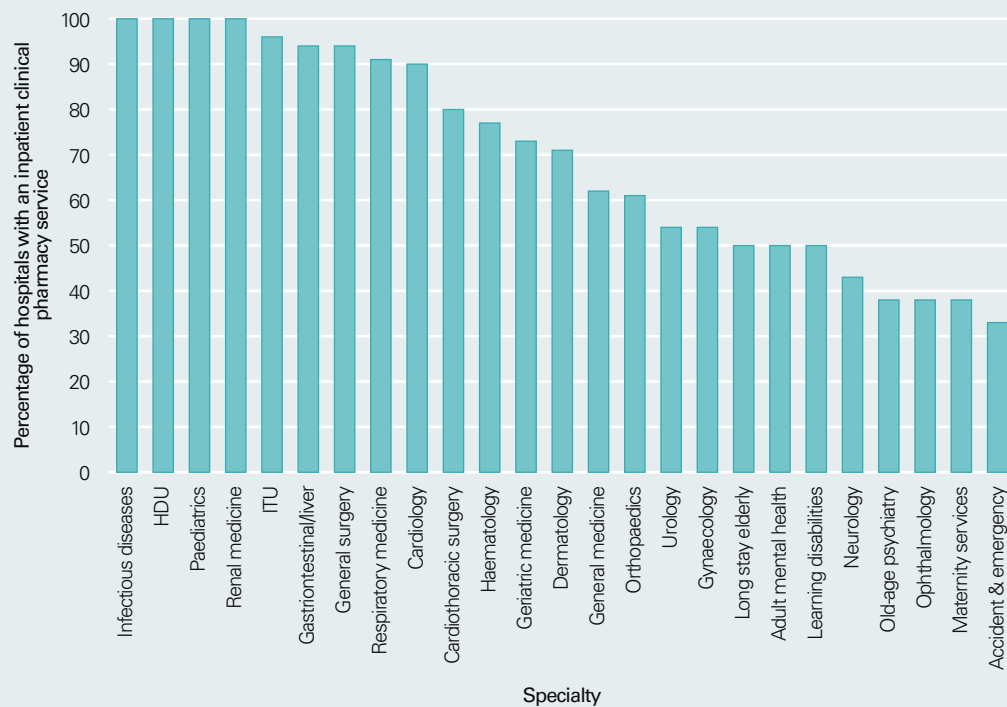
Recommendation

- NHS boards should review clinical pharmacy services and develop plans to address gaps in the service.

The proportion of time pharmacists spend on clinical roles varies

80. The proportion of time pharmacists spend on clinical roles ranges from 18% to 71% (Exhibit 11 overleaf).

81. Pharmacists, pharmacy technicians and pharmacy assistants are all involved in providing a pharmacy service. Exhibit 12 (page 29) shows the variation in skill-mix, based on the number of established posts. The proportion of pharmacists varies from 34% to 52% of total staffing, with an average of 42%. The proportion of pharmacy technicians ranges from 32% to 45%. Pharmacy technicians work mainly in the dispensary, but they increasingly work on wards, particularly wards that have introduced new ways of working in line with the national pharmaceutical strategy.

82. All boards have hospital pharmacy technicians who carry out some work on wards. In most cases, this involves checking the patients' own medicines when they

are admitted to hospital. Technicians may also label medicines for use on the wards and for discharge. In some hospitals, technicians are providing education for patients following training from the pharmacists.

83. NHS boards and hospitals have taken action to release pharmacists' and technicians' time from dispensary-based work. The main actions have been training pharmacy assistants and technicians to carry out extended roles, and redesigning the way that medicines are supplied on wards to reduce the workload in the dispensary. Some NHS boards are also considering the potential benefits of centralising pharmacy services, using automation in the dispensary and utilising the private sector, for example, to supply medicines from a central site to other hospitals.

84. Each NHS body has developed its own education package for pharmacy technicians working in these extended roles, with the exception of work covered by national training, such as the Dispensary Checking Technician qualification. There is no national accreditation of this education. This means duplication of effort and a lack of standardisation between NHS bodies. As technicians move between hospitals, there is no system to provide assurance on their education, skills and competency. An Association of Scottish Chief Pharmacists (ASCP) Task Group is developing standardised education for pharmacy technicians, working with Telford College. ASCP is also working with Telford College to update the HNC in Pharmaceutical Sciences to take on board some changes in technicians' roles.

Recommendations

NHS boards should:

- review the way that hospitals provide pharmacy services and identify opportunities to change working patterns and the skill-mix to give pharmacists and technicians more time to work with patients and staff in wards and clinics

- work to nationally agreed standards for training technicians in extended roles.

Automation can increase the efficiency of pharmacy services

85. Automation involves using a robot to carry out some stock dispensary processes, most frequently supplying medicines from storage to the dispensary for labelling and checking. Automation requires hospitals to have changed to supplying original packs of medicines, in line with *The Right Medicine.* All medicines are labelled with barcodes, so if medicines are labelled correctly, the robot cannot supply the wrong medicine, reducing the chances of a mistake. Automated systems are in place in a small number of hospitals in England[31] and Wales,[32] where this is a national project. Funding of £1.2 million was made available to implement automation in three hospitals in Wales.

86. Evaluation of the systems in England and Wales found that automation reduced the time taken to supply medicines, reduced dispensing errors and allowed managers to change the skill-mix of pharmacy staff working

31 *Implementing automation in a hospital pharmacy*, Fitzpatrick R, Hospital Pharmacy Europe, March/April 2004.
32 http://www.pjonline.com/pdf/hp/hpconf2004/way.ppt

Exhibit 10
Provision of a clinical pharmacy service at different stages in the patient journey

A clinical pharmacy service is most often provided to inpatients.
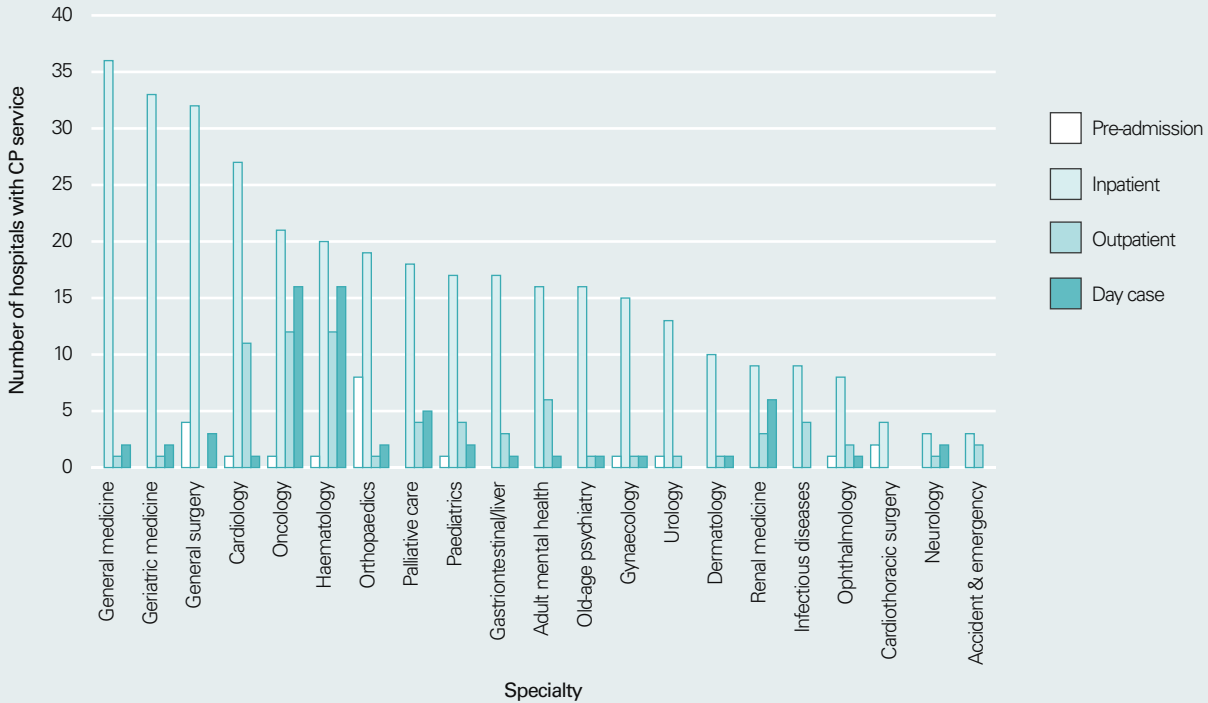
Source: Audit Scotland survey, September 2003

Exhibit 11
Percentage of pharmacist time spent providing traditional and clinical pharmacy services

Pharmacists spend from 18% to 71% of their time on clinical services.
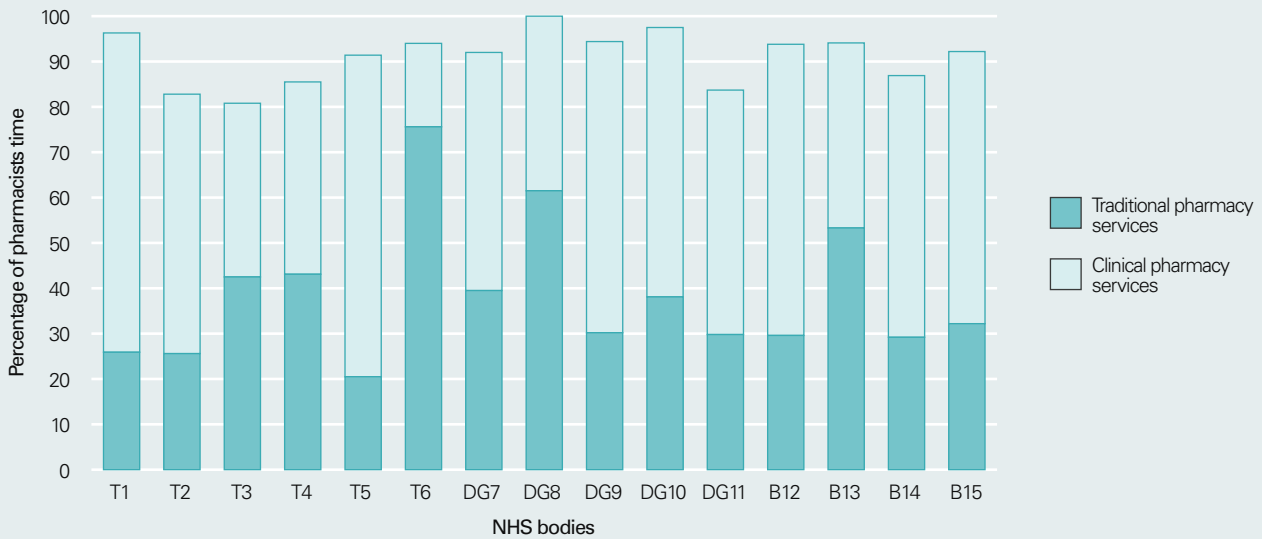
Note: The figures in Exhibit 11 do not sum to 100% in most cases because pharmacists are also involved in activities that are neither traditional (such as working in the dispensary), nor clinical, such as education, quality assurance, management, monitoring use of medicines and managing the joint formulary.

Source: Audit Scotland survey, September 2003

Exhibit 12
Pharmacy skill-mix in the NHS bodies

Skill-mix varies in hospitals.
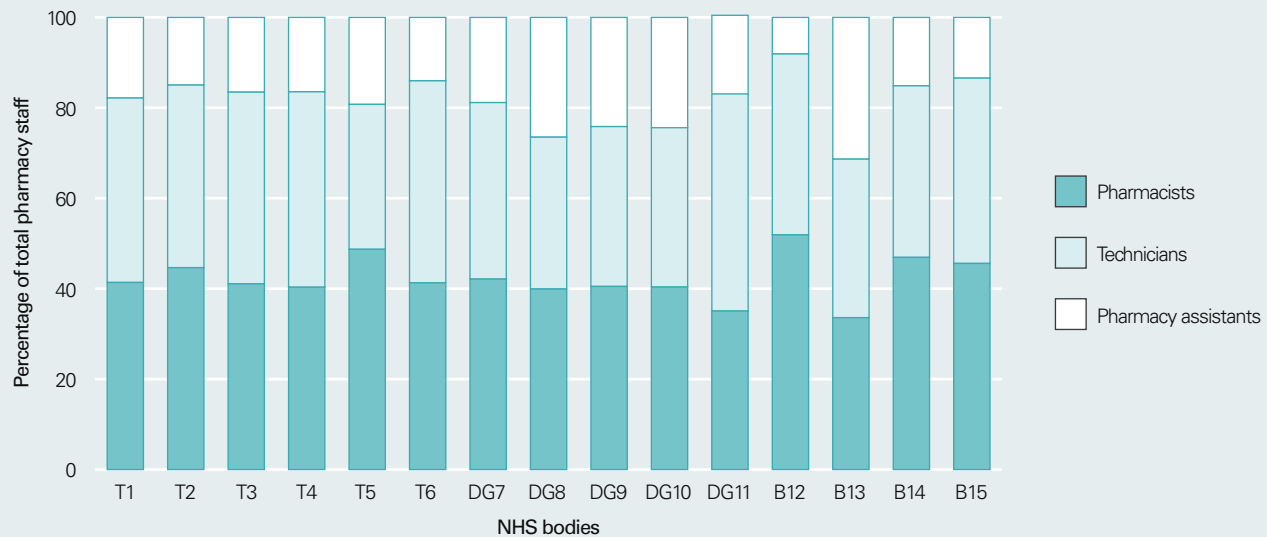
Source: Audit Scotland survey, September 2003

in the dispensary. It is a means of releasing staff time from traditional dispensary based activities to work more with patients on the wards. This complements changes in skill-mix and a reduction in dispensary-based activities associated with changes in the way that medicines are supplied on wards.

87. There is no national strategy on automation in Scotland. Automation is not in place in any hospital in Scotland, but it is being considered by some, particularly NHS Greater Glasgow.

Recommendation

• The SEHD should work with NHS boards to explore the potential benefits of using automation in hospital dispensaries.

Many areas have problems recruiting and retaining pharmacists and technicians

88. It is not clear that workforce planning and education was integrated into the national pharmaceutical strategy, despite its implications for clinical pharmacists and for technicians working in extended roles.

89. At the time of the survey, almost half of NHS boards had vacancy rates of over 10% for pharmacists and a third had vacancy rates over 10% for pharmacy technicians. There were 57 vacant pharmacist posts in Scotland, almost half of which were filled by locum/agency or temporary staff. There were 45 vacant posts for pharmacy technicians and over two-thirds were not filled (Exhibits 13 and 14 overleaf).

90. All mainland NHS boards, except NHS Borders and NHS Fife, had pre-registration pharmacist places in their hospital services.[33] There are a total of 42 WTE pre-registration places, ranging from one to 13 places in each NHS board. All places were filled. We identified 57 WTE vacant posts for hospital pharmacists across the 15 NHS bodies, higher than the number of pre-registration places. This raises concerns about the future development and sustainability of services, particularly with the increases in demand for clinical pharmacists to meet the requirements of *The Right Medicine*.

91. Some NHS bodies have carried out needs assessments, which have identified that established staffing levels are insufficient to meet current and future needs. These shortfalls are not included in the 57 vacant posts.

33 Pre-registration pharmacists are those who are in the year between university and gaining their professional qualification.

Exhibit 13
Vacancy rates for pharmacists

Almost all NHS boards have vacancies for hospital pharmacists.
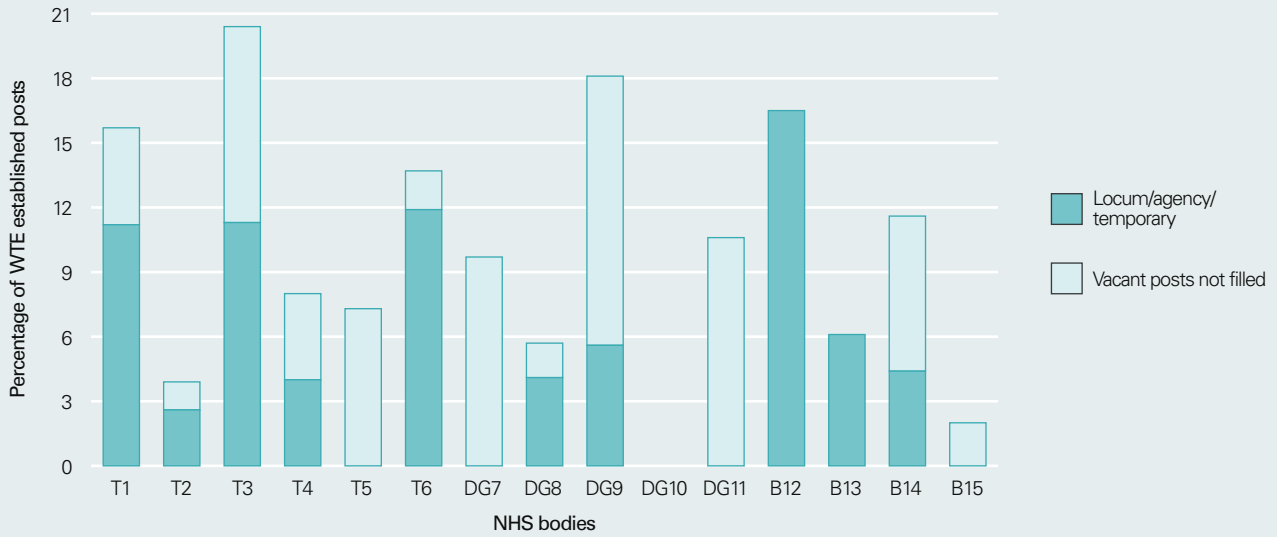
Source: Audit Scotland survey, September 2003. Based on data as at 31 July 2003

Exhibit 14
Vacancy rates for pharmacy technicians

There are more vacancies for pharmacy technicians in teaching hospitals.
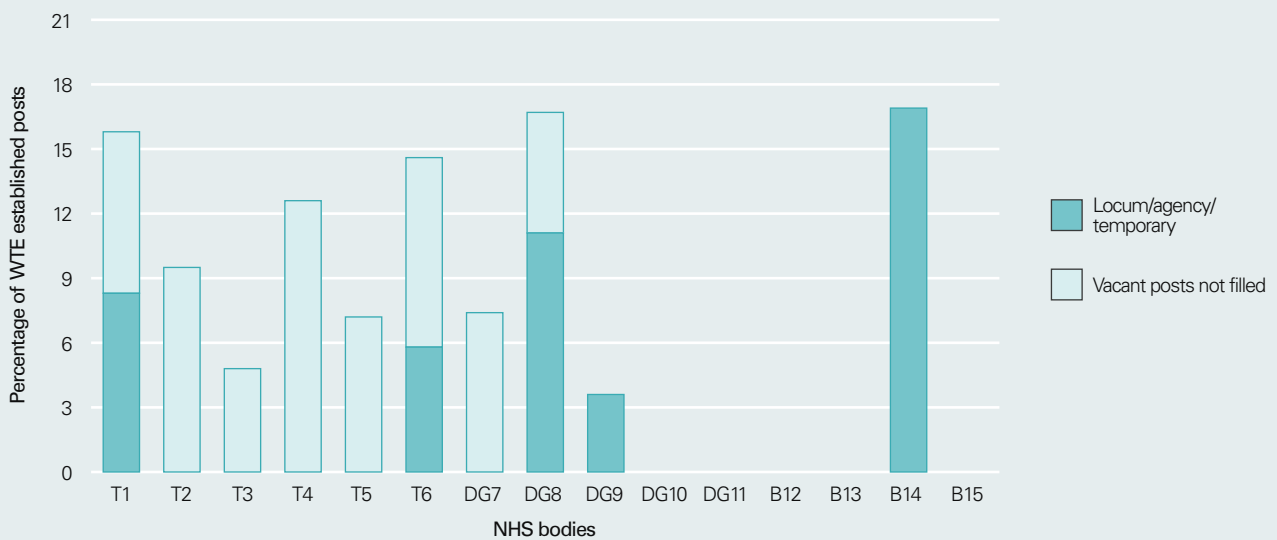
Source: Audit Scotland survey, September 2003. Based on data as at 31 July 2003

92. Workforce planning for pharmacists is not well developed. The SEHD is collecting baseline data during 2005 and intends to include projections of future needs in the national workforce plan for 2006. Workforce planning has to accommodate the effects of changes in the way medicines are supplied, new prescribers, extended roles and the potential need for extended hours. The Royal Pharmaceutical Society has worked with the Departments of Health in England, Wales and Scotland to develop a workforce planning model.[34] The SEHD's Workforce Development Unit is looking at how to use this model in Scotland. Actions by the SEHD are limited since the number of university places for pharmacists is determined by the universities – unlike medicine and nursing, these places are not funded or controlled by the SEHD.

93. Changes in the way pharmacy services are provided also mean an increased demand for pharmacy technicians as they take on extended roles and roles currently carried out by pharmacists. Again, there is no national workforce planning in place. There is no model available to calculate the numbers and skill-mix of pharmacy staff required for different hospital case mix and levels of activity; in Scotland, there has been work only on cancer services.[35]

**Recommendations**

The SEHD should:

• improve workforce planning for pharmacists and pharmacy technicians. The SEHD and NHS boards should ensure that workforce planning includes pre-registration pharmacist posts and that sufficient training posts are available to meet the future needs of the service

• work with NHS boards and the pharmacy profession to develop meaningful measures of activity for pharmacy staffing to inform workforce planning.

Staff need education that meets patients' needs

Junior doctors' education may not fully prepare them to prescribe medicines

94. Medical students are taught about the workings of the human body, such as the heart. They are not taught about support specialties such as pharmacology[36] and therapeutics as separate subjects, but as part of general teaching in subjects such as cardiology. Concerns have been expressed that this may not give medical students sufficient understanding of medicines as a specialist subject, particularly the complexities of medicines and how they work and interact. In particular, some commentators have suggested that junior doctors are more likely to make mistakes because they do not have this level of information.[37] Staff in these training grades are under the supervision of experienced senior medical colleagues. A recent report by the DoH recommended that undergraduate teaching in pharmacology and therapeutics should be strengthened.[38] Undergraduate medical education is the responsibility of the General Medical Council (GMC).

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34 *Future pharmacy workforce requirements; workforce modelling and policy recommendations*, Pharmacy Workforce Planning and Policy Advisory Group (2005). Report commissioned by the Royal Pharmaceutical Society of Great Britain on behalf of the Chief Pharmacists for England, Scotland and Wales.
35 *The development of a capacity planning model for pharmaceutical services to cancer patients*, Low J, Macintyre J, McIver L, Lannigan N, on behalf of the Association of Scottish Trust Chief Pharmacists, The Pharmaceutical Journal, 15 February 2003; 270: 239-240.
36 Pharmacology is the study of medicines and drugs, including their action, their use and their effects on the body.
37 For example, *Reducing prescribing error: competence, control and culture*, Barber N, Rawlins M, Dean Franklin B, Qual Saf Health Care, 2003; 12: i29.
38 *Building a Safer NHS for Patients: Improving Medication Safety*, DoH, January 2004.

Good practice example 10
Lanarkshire Acute Hospitals Division

The Medical Education and Pharmacy Departments have developed the Medical Education system (MedEd) as a means of teaching and assessing junior doctors. This is a web-based system that assesses junior doctors' prescribing knowledge using a series of case studies and multiple choice answers. Junior doctors must complete the assessment within two weeks of starting work. They get their results and feedback on incorrect answers by email. Clinical pharmacists contact those with low scores to provide further education and support.

This package is being rolled out throughout Scotland by NES.

95. Managers and staff in many NHS bodies expressed concerns about junior doctors' knowledge of medicines when they start work as pre-registration house officers (PRHOs). Undergraduate education on prescribing and medicines should be reviewed to ensure that it meets the needs of patients. However, NHS boards also need to ensure that they have systems in place to provide guidance, education and advice for PRHOs. This support is not always available, other than through senior colleagues, particularly in areas with no, or a very limited, clinical pharmacy service. Most NHS bodies provide limited induction training for PRHOs, covering a very wide range of topics in a short time. Induction programmes generally only include a short talk about prescribing, local guidelines and the joint formulary (Good practice example 10).

96. Given the concerns and anecdotal evidence that PRHOs may lack knowledge of the complexities of medicines, the SEHD should work with the universities to review the curriculum for medical students, piloting and evaluating the impact of introducing more specific education in pharmacology. The change in education through Modernising Medical Careers is an opportunity to make medicines and prescribing a greater part of junior doctors' education. Postgraduate tutors and NES should review ongoing education needs for doctors in relation to prescribing and medicines.

97. More staff from different disciplines are able to prescribe medicines, providing an opportunity for joint undergraduate and postgraduate education in pharmacology for medical students, nurses and pharmacists. The core competencies are the same and this is an opportunity to develop a shared understanding. Some NHS boards are in dialogue with universities about developing joint education. Collaboration between Robert Gordon University and Aberdeen University allows joint teaching for medical and pharmacy students. Clinical pharmacists from Grampian University Hospitals and South Glasgow University Hospitals are involved in formal teaching for undergraduate medical students.

There is no national training in administering IV medicines

98. Nurses and midwives spend up to 40% of their work time preparing and administering medicines to patients.[39] While all nurses and midwives are expected to administer oral medicines following training and induction, only some are allowed to administer IV medicines. To do this, they need to undertake further local training and assessment.

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39 *A Spoonful of Sugar*, Audit Commission, 2001.

99. Local training in administering IV medicines varies significantly, particularly the content of training and drug calculations. All but six NHS bodies include an examination in drug calculations as part of the assessment, and nurses have to obtain 100% to pass. The remaining six assess drug calculations through observed practice. Training in IV medicines administration should be standard across Scotland to provide reassurance on skills and competencies. NES is developing a national framework. However, this is not a statutory requirement for boards, so all NHS bodies may not necessarily comply with the national standards. Refresher training is not routinely available in many NHS bodies.

100. NHS Lothian has developed a 'passport' for nursing staff which includes details of their skills and competencies. Bank staff are also provided with a passport. This allows staff to move between hospitals in Lothian without needing to retrain. NES is now developing a national passport.

101. Other staff, particularly medical staff, administer IV medicines. NHS boards should ensure that all staff have appropriate training, as recommended by NHS QIS.[40]

Locum, agency and bank staff
102. Most NHS bodies do not have a policy on the tasks that temporary staff, such as locum doctors, and bank and agency nursing staff, can carry out in administering and prescribing medicines. A number of NHS bodies reported that agency staff are not permitted to undertake any tasks, or a limited number of tasks, related to administering medicines.

Recommendations

- The SEHD should work with universities to review education in medicines and prescribing for medical students to ensure that it meets the needs of patients.

- Postgraduate tutors and NES should work together to ensure that postgraduate medical education in relation to medicines and prescribing meets the needs of patients.

- NHS boards should introduce standardised training in administering IV medicines developed by NES.

- NHS boards should implement a system that records up-to-date information on the assessed skills and competencies of nurses and midwives, including bank and agency staff, in relation to administering medicines.

- NHS boards should develop policies to ensure that locum, bank and agency staff are not prescribing, dispensing or administering medicines without the appropriate induction and assessment of competency, whenever possible. They should also develop policies on the circumstances under which these staff can undertake tasks involving medicines.

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40 *The preparation of injections in near-patient areas including clinical and home environments*, Clinical Resource and Audit Group (CRAG), Good Practice Statement, 2003.

Part 5. Information on the use of medicines

Main findings

- The lack of data linking medicines prescribed to information about the patient makes it difficult for boards to monitor compliance with local and national guidance and cost-effective prescribing. However, high-level data can be used to monitor performance and to identify opportunities for further investigation and improvement. This is happening well in some NHS boards, but is very limited in others.

- The NHS in Scotland needs to make more use of IT to improve access to guidance on prescribing, reduce the risks of errors, and improve reporting, monitoring and feedback on how medicines are used. A national hospital electronic prescribing and medicines administration system will be complex to develop but would address a number of gaps in information about medicines used in hospitals. This requires commitment from managers and staff to make best use of IT to support improvement in patient care.

- The SEHD has not developed a clear project plan and timescale to implement a standard hospital electronic prescribing and medicines administration system.

NHS boards and the SEHD need better information to monitor the use of medicines

103. The NHS in Scotland does not collect or publish national data on the use of medicines in hospitals. There are significant gaps in the information that NHS boards and the SEHD require to monitor the use of medicines in hospitals at national and local levels. These issues require action at a national level. The main gaps in information are:

- No link between the medicine prescribed and individual patient details, such as the patient diagnosis. In almost all hospitals in Scotland, these data can only be collected by labour-intensive manual clinical audit, and this does not happen routinely. This information would help NHS boards to monitor whether prescribing was in line with best practice.

- No link between the medicine prescribed for a condition and the patient outcome. This would help NHS boards to monitor the effectiveness of medicines, particularly new medicines.

- No link between hospital and primary care data, so it is not possible to look at continuity of prescribing.

- 'Prescribing' in outpatient clinics is normally done through a letter to the GP recommending a particular medicine or type of medicine. Recommendations from outpatients can only be identified from paper records.

104. These gaps in information prevent national benchmarking and make it difficult to develop meaningful performance indicators. These are not in place at national or local level, other than some specific indicators that NHS boards are developing. There are no indicators relating to hospital prescribing in the national Performance Assessment Framework (PAF).

105. NHS boards have information on the amount of each medicine used and the cost, mostly to ward level. They use this to monitor and investigate variation, but the information is limited. NHS boards rely on treatment protocols, guidance on best practice, joint prescribing formularies, educating staff and review by clinical pharmacists to move towards best practice in prescribing. The MUU is reviewing how to make best use of the data available currently to NHS boards and the SEHD.

The value of monitoring reports varies among boards

106. Electronic pharmacy systems in hospitals record the amount of each type of medicine supplied to each ward. This information can be used to produce reports on trends and variation in the use of medicines and to identify changes that should be investigated. Most hospital information systems currently used are not designed to collect data on medicines prescribed for individual patients.

107. We interviewed a small sample of directorate or clinical service management teams in all NHS bodies. All but one management team received regular reports on expenditure on medicines. These reports are produced by finance and/ or pharmacy departments. Different NHS bodies provide different levels of detail in the reports. This ranges from high-level expenditure data,

through to data broken down by individual wards and different types of medicines. A number of NHS bodies also list the medicines incurring the highest expenditure and analyse trends.

108. Pharmacy produced the reports in five NHS bodies and had input to the reports in a further nine. Some NHS bodies produce both finance reports and pharmacy reports, and there is scope to work together to avoid duplication. Where pharmacy was involved in producing reports, they did not always provide commentary to interpret them due to competing calls on their time. The main gap identified by directorate teams was a lack of detail to allow them to identify areas of concern, particularly where the reports are high level only.

109. It is not a good use of pharmacists' time to produce the reports themselves. We found examples of staff giving up some of their clinical duties to do this. Pharmacy departments should work with finance and IT departments to develop automatic reports. Pharmacists could add value by providing a commentary to make it easier for management teams and prescribers to interpret the reports. The reports should be used to encourage cost-effective prescribing and compliance with national and local guidelines, and to identify future cost pressures. This should be done by clinical pharmacists familiar with best practice and with the reasons for current and expected future cost pressures (Good practice examples 11 and 12 overleaf).

110. Information on the use of medicines is more robust in some specialties, such as oncology, through the work of the MCNs, regional cancer networks, Scottish Cancer Pharmacy Group and national audit.

111. None of the NHS bodies monitors medicines recommended at outpatient clinics. Forth Valley Acute Hospitals Operating Division collects this information, but only in paper format. NHS boards need information for monitoring and to ensure the most appropriate treatment for patients. However, this is not seen as a priority by most acute operating divisions as it does not affect their medicines budget.

Recommendations

- NHS boards should ensure that directorates receive regular reports on use of and expenditure on medicines. These reports should include commentary from pharmacy, identifying reasons for changes and emerging pressures.

- Pharmacy departments should work with finance and IT departments to develop automatic reports, or work with a data analyst, so that it takes less pharmacist time to produce reports on use and expenditure on medicines.

Clear leadership is needed for the effective management of medicines

112. It is important that spending on, and the risks associated with, use of medicines, such as medication errors or ADRs, are managed effectively. This means that NHS boards need to have a full understanding of medicines issues when making decisions on medicines' budgets and managing risks. There needs to be clear leadership and accountability for these issues at NHS board and operating division level.

Good practice example 11
Lothian University Hospitals Division

A pharmacist has developed a database 'Pharmacy Reporter' which works with the ASCRIBE pharmacy system. This was set up to improve reporting and to produce reports from the combined data from the three pharmacy computer systems in the division. The aim is that any member of staff can use Pharmacy Reporter to produce the information they need, making information more accessible and freeing up pharmacist time. Reports can be produced at division, hospital, service, directorate and ward level, and at different levels of detail on medicines, such as type of medicine and individual medicine name. Specific reports are also added, as required, such as expenditure on SMC-approved medicines. Two styles of standard report are produced: reports for a single time period, such as one month, and annual reports that show the position each month.

Good practice example 12
Tayside Acute Services Division

The principal pharmacists provide regular reports on medicines utilisation for the clinical group management teams. Comprehensive annual reports are also produced for the clinical groups. These provide commentary on the situation within the clinical group, reasons for unexpected variations in use and/or expenditure and expected future developments and pressures.

Exhibit 15
The position of pharmacy managers in NHS bodies

Pharmacy is not represented at the highest levels of decision-making in most NHS bodies.

Position of pharmacy manager	Number of NHS bodies
Member of Senior Management Team (SMT) – Board – Operating division	1 3
Reports to medical director	2*
Reports to directorate general manager (represented on SMT through general manager)	7
Reports to service manager (who reports to directorate general manager)	1
Under review	1

Note: * One manager also receives the agenda for the operating division senior management team and attends as appropriate.

Source: Audit Scotland fieldwork, November 2003-September 2004

113. Pharmacists have an overview of the wide range of issues that contribute to the appropriate and cost-effective use of medicines. But in many NHS boards they are only indirectly represented at a senior level (Exhibit 15).

114. The new unified NHS boards provide opportunities to develop unified pharmacy services, and this will need clear leadership. A number of NHS boards, including NHS Ayrshire & Arran and NHS Grampian have appointed an overall director for pharmacy services across hospital and primary care. Others are moving in this direction, while some are retaining separate hospital and primary care services but working closely together (Good practice example 13 overleaf).

Recommendation

- NHS boards should ensure that pharmacy is represented at the senior levels of decision-making in the NHS boards and operating divisions.

Some ADTCs/Medicines Resource Groups play an active role in monitoring and taking action to improve performance

115. NHS boards need regular reports on the use of medicines. All receive high-level reports on expenditure on medicines. All boards have an ADTC and all but four have a Medicines Resource Group. Medicines Resource Groups primarily have responsibility for financial issues, such as advising on medicines budgets and managing how new medicines are implemented. A number of NHS boards and operating divisions have hospital Drugs and Therapeutics Committees (DTCs) which generally manage more local issues. Exhibit 16 (overleaf) outlines some of the areas of activity of these groups. More than one group is involved in this work at a number of NHS boards (Good practice examples 14 and 15, page 39).

116. Only two of the ADTCs report formally to the board. Two have an advisory role to the board but no formal reporting line. Others report to the Clinical Board, Clinical Governance Committee, Senior Management Team or directly to an executive director. Three of the Prescribing Management Groups (PMGs) report directly to the board. These arrangements mean there is a lack of assurance that appropriate medicines issues will get onto the board agenda. In addition, almost all ADTCs, DTCs and PMGs have no formal links with clinical governance or risk management structures. NHS boards should review the reporting arrangements for ADTCs and PMGs.

Recommendation

- NHS boards should review the reporting arrangements for ADTCs and PMGs to ensure that appropriate medicines issues get onto the board agenda.

Wider use of IT could improve the use of medicines in hospitals

117. IT can be used to provide staff with immediate access to guidance on prescribing, reduce the risks of medication errors and improve reporting, monitoring and feedback. It can also be used to improve communication between hospitals and primary care. The *National eHealth/IM&T Strategy*[41] notes that IM&T will help to improve patient safety and quality of care in relation to prescribing.

118. The major initiatives that would offer benefits to hospital patients are a national Hospital Electronic Prescribing and Medication Administration (HEPMA) system and electronic communication between hospital and primary care. The SEHD is taking forward these developments on a national basis, but there are no timescales for completion.

The infrastructure to support national initiatives is developing

119. A number of essential components need to be in place to support a HEPMA system and electronic communication between hospitals and primary care (Exhibit 17, page 40). The SEHD should establish timescales for these components to support other developments.

Recommendation

- The SEHD should clarify the timescale for moving to a national drug dictionary and for full roll out of the Community Health Index (CHI) number to inform other developments.

A standard HEPMA system would help to improve use of medicines

120. HEPMA systems are used at the patient's bedside by staff prescribing and administering medicines. At individual patient level they record what medicines have been prescribed, and when and how medicines should be administered. They also record

41 *National eHealth/IM&T Strategy 2004-2008*, SEHD, April 2004.

Good practice example 13
NHS Ayrshire & Arran

NHS Ayrshire & Arran has developed a single pharmacy service for both hospital and community pharmacy, pharmaceutical public health and prescribing advice. The Director of Pharmacy was appointed in December 2004 and reports directly to the Chief Operating Executive. The Director of Pharmacy is a member of the senior management team leading Patient Services and provides pharmacy advice to the NHS board.

Exhibit 16
Roles of committees with responsibility for medicines issues

Most committees with responsibility for medicines issues are not involved in monitoring use and expenditure on medicines.

	Area Drugs and Therapeutics Committee (ADTC)	Prescribing Management Group (PMG)	Hospital Drugs and Therapeutics Committee
Review of medication incidents	1	1	5
Management of the joint formulary	6	5	2
Advising on budgets for medicines	3	3	0
Monitoring use of new medicines	2	4	0
Monitoring spend on new medicines	3	2	0
Monitoring use of all medicines	4	4	2
Monitoring spend on all medicines	1	5	0
Managing introduction of new medicines	8	6	2

Source: Audit Scotland fieldwork, November 2003-September 2004

Good practice example 14
NHS Fife

The Medicines Resource Group (MRG) produces six-monthly overview reports for the Joint Executive Team of NHS Fife (JET). These reports include specific areas of prescribing that the MRG and the ADTC have identified for further investigation. Progress is reported to the JET at subsequent meetings.

Good practice example 15
NHS Argyll & Clyde

The ADTC is involved in monitoring use of and expenditure on medicines. Members include the Board's Associate Director of Finance. The committee receives regular reports from finance and pharmacy on area-wide expenditure on medicines and top spends in hospital. These include projected expenditure on new medicines approved for use in NHS Argyll & Clyde. The reports provide detailed information at division, hospital, LHCC and practice level. The ADTC looks at budget issues and cost pressures across NHS Argyll & Clyde, identifying areas for investigation and making recommendations about the allocation of the medicines budget. It has a programme to review specific high-cost medicines in hospital and primary care. The ADTC is formally accountable to the Board Finance Committee for financial issues and provides regular reports to the committee.

information entered by staff on what was actually administered, when and how (Exhibit 18, page 41). HEPMA systems have been shown to reduce errors in prescribing and administering medicines. They also provide the information needed to monitor whether prescribing is in line with local guidance. At national level, these data can inform benchmarking.

121. Exhibit 18 (page 41) outlines some of the potential advantages of a HEPMA system.

NHS boards need to meet a number of requirements before they can consider implementing a HEPMA system

122. It takes a long time to put in place the necessary infrastructure to support a HEPMA system and to develop, pilot, evaluate and refine a system. The SEHD has identified the following requirements to introduce a HEPMA system, confirmed by the experience in Ayr Hospital:

- Financial commitment.

- Full commitment from managers and clinicians.

- Identified clinical leaders to drive this development – in Ayr Hospital the project was sponsored by the DTC, and this was crucial in gaining clinical support.

- A patient administration system providing demographic details.

- A change in culture among doctors, nurses and pharmacists, moving to a new way of working.

- Robust contingency plans, including back-up server, resilient network and alternative back-up processes to ensure access to information about the patient's medicines at all times and to ensure that information is not lost.

- IT support that is available 24 hours a day, seven days a week to ensure that any difficulties can be dealt with immediately to avoid any risks of staff not having access to information.

- A common drug dictionary that allows information to be shared between hospitals, between hospitals and primary care, and at national level.

- Appropriate hardware available in all areas where staff prescribe and administer medicines.

- Staff education in the application and use of the technology.

Exhibit 17
Components required to develop a HEPMA system and electronic communication

The SEHD and NHS boards are moving forward on the essential components required to progress national IM&T developments.

Initiative	Impact	Progress
Using the CHI number as the unique patient identifier on all patient records.	• This is required to facilitate communication and share information within hospitals and between hospitals and primary care. • This is a priority in the national IM&T strategy.	• There is evidence of progress in all NHS boards. • This is fully in place in NHS Tayside.
Populating electronic systems that record information on medicines with a national drug dictionary.	• This is necessary so that all electronic systems record medicines in the same way.	• A national dictionary for Drugs, Medicines and Devices has been agreed in England. • The NHS in Scotland has agreed in principle to adopt this national drug dictionary. • Hospital and primary care systems have still to be populated with the national drug dictionary. The next version of the GPASS GP system will incorporate the Drugs and Medical Devices Dictionary.
Developing standards for a HEPMA system.	• National standards are required to clearly specify what providers need to include in a HEPMA system.	• The SEHD issued draft standards for consultation in 2004. • The next stage is to test the standards.

Source: Audit Scotland

Exhibit 18
Potential advantages of a national HEPMA system

A HEPMA system offers a range of potential benefits.

Areas for improvement identified in the report	Potential benefits from a HEPMA system
Provide staff with access to information about the medicine and guidance at the point of prescribing.	HEPMA could have links to local and national guidance, either as a reference for the prescriber or to suggest medicines as part of the decision support system.
Monitor use of unlicensed medicines and medicines used off-label.	A HEPMA system can link the medicine prescribed with the patient details, including the patient's medical condition. All pharmacy stock control systems can identify use of unlicensed medicines from the names of the medicines. HEPMA can issue alerts to prescribers, identify any trends, such as higher levels of use by some prescribers, and identify issues for further investigation.
Monitor compliance with local and national guidance, such as the joint formulary, antibiotics guidelines and treatment protocols.	As a HEPMA system records information at individual patient level, it can be used to report on compliance with national and local guidance, for example, by looking at whether medicines used to treat particular conditions are in line with guidance. Reports can be fed back to managers and prescribers, and used to encourage further improvement.
Support cost-effective prescribing.	As above.
Reduce medication errors.	Prescription charts are written and stored in electronic format, reducing the risk of errors associated with poor handwriting. The prescriber uses menus to select the name of the medicine, strength, dose and other information. This reduces the risk of the wrong medicine being prescribed. HEPMA systems can have integral decision support, which can warn the prescriber of the risks of interactions between medicines or other contraindications.

Initial evaluation of the system at Ayr Hospital found that:

• compliance with requirements for writing prescriptions increased to 100%

• prescribing errors or near misses reduced by 5% after one month and by 36% after one year

• administration errors and near misses reduced by 33% after one month and by 39% after one year. |

Exhibit 18

Ensure that patients taking high-risk medicines are seen by a clinical pharmacist.	Pharmacy clinical teams can review information stored on the HEPMA system on a daily basis to identify the names and location of patients taking medicines that are known to need careful monitoring, such as Warfarin. They can cross-refer this to whether or not a clinical pharmacist is working on that ward. If not, they can ensure that all patients taking these medicines are seen by a clinical pharmacist.
Monitor use of new medicines.	It can be used to monitor use of new medicines and whether they are being used in line with treatment protocols.
Monitor patterns of use and expenditure on medicines.	It allows more detailed reporting and trend reporting on what medicines are being used by which prescribers and for what clinical conditions, to identify any need for improvement.
Review the effectiveness of medicines for treating specific diagnoses.	The information recorded in a HEPMA system provides part of the information needed to review the effectiveness of medicines. Information on the conditions the medicine was used to treat should be compared to data on the clinical outcomes.

Source: Audit Scotland

123. There are few examples of well-developed HEPMA systems. It has been estimated that only 6% of hospitals in the USA[42] and a handful of hospitals in England have a HEPMA system.[43] There are plans to roll out a national HEPMA system in England in 2006,[44] brought forward from previous plans to implement it in 2008-2010. This will build on the work done in those hospitals that already use a HEPMA system.

There are no timescales for when a national HEPMA system will be introduced in Scotland

124. An electronic prescribing system has been developing at Ayr Hospital over a number of years (Exhibit 19). This is the national pilot for a HEPMA system in Scotland and is supported by a robust local Hospital Information Support System (HISS). Over the same period, the SEHD has repeatedly stated its commitment to developing HEPMA,

but has still to develop a project plan and timescale to develop and implement it. There has been an increase in activity in recent years, following publication of *The Right Medicine*. The SEHD has developed national standards and has informed NHS boards that HEPMA will be introduced as a national initiative. The Kerr report recommends that the Scottish Executive should procure a single IT system for Scotland that includes electronic prescribing as soon as possible, and by 2008 at the latest.[45]

125. Ayr Hospital has been identified as the national pilot, but the work and funding to develop the system has mostly come from NHS Ayrshire & Arran and the predecessor Trusts. It was not established as a national pilot, but was initially a local initiative to meet local needs. This has involved a large amount of work and investment for one organisation, with limited national support and funding.

126. There is no documented project plan to implement a national HEPMA system. The SEHD is continuing to develop the requirements for a HEPMA system as part of a coordinated approach to information systems in Scotland that will result in a single medical record for patients. Spending on IM&T is expected to increase significantly from 2006/07.

127. The SEHD has stressed that significant work is required to develop a HEPMA system. Until recently there were no well-developed and comprehensive systems already in place to provide a model. The focus of initial work is to take forward the necessary components to develop a system – implementing the national drug dictionary, testing the national standards, further testing the system in Ayr and testing it in two other NHS board areas. This phase of the project is expected to last until early 2006.

42 *A report on Hospital Electronic Prescribing and Medication Administration* (HEPMA), draft report commissioned by the Chief Pharmaceutical Officer. Issued for consultation by SEHD, 13 May 2004.
43 *Vision of Medication Management in the Electronic Era (Draft)*, Care Record Development Board (CRDB): Electronic Medicines Management Team, February 2005.
44 Announcement by Lord Warner, Health Minister, June 2004.
45 *Building a health service fit for the future: A national framework for service change in the NHS in Scotland*, SEHD, May 2005.

Exhibit 19
Progress towards developing a national HEPMA system

A HEPMA system has been developed in Ayrshire & Arran.

1995	Ayr Hospital undertook a procurement exercise for a HISS with an electronic prescribing system. The electronic prescribing system in the successful HISS was unsuitable. Ayr Hospital then replaced their pharmacy system, moving to a company committed to developing a HEPMA system based on UK standards and practices.
1998	Ayr Hospital worked with the company to develop an electronic prescribing and medication administration system. The system was introduced as a pilot in one ward in Ayr Hospital.
1998-2002	The SEHD provided limited funding to support evaluation of the project at Ayr Hospital.
2000	The SEHD stated that the priority is to get the infrastructure (IT networks, national drug dictionary, developing an electronic patient record) in place prior to developing electronic prescribing.[46]
2001	The system at Ayr Hospital was redesigned and developed further and then rolled out to another nine wards. There was good clinical ownership of the system.
2001	The *National IM&T Strategy 2001-2005* was published. This states that the SEHD will encourage hospitals to evaluate and introduce ward level computerised prescribing systems, specifically in relation to antibiotic resistance. The strategy does not give a timescale.
2002	*The Right Medicine* was published. This includes an action to develop standards for electronic prescribing in hospitals by December 2003.
2003	The draft *National e-Health/IM&T Strategy* was published. This identifies hospital electronic prescribing as a component of work to develop an integrated health record. The strategy does not give a timescale.
2004	The SEHD issued the national standards (principles) for a HEPMA system.
2004	The SEHD issued a 'Dear Colleague' letter saying that HEPMA should be developed as a national initiative and boards should do no further work at a local level. Ayr Hospital is an exception to this, acting as a national pilot. The draft report attached to the letter outlined the actions it expects to take place over the next 24 months relating to the national standards and development work. It states that over the next 24 months NHS boards need to ensure that the appropriate IT infrastructure is in place prior to implementation of HEPMA as part of the integrated care record.
2004	The national drug dictionary agreed in England was accepted, in principle, for use in Scotland.
2004	The SEHD budget statement announced that national IM&T initiatives will get a larger increase in funding from 2006/07.[47]
2005	At Ayr Hospital, new functionality has been developed and tested, taking into account user needs. This is due to be implemented in the remaining wards in Ayr Hospital and its associated rehabilitation unit at Biggart Hospital in 2005.
2005	At Ayr Hospital, a specification has been developed to use the discharge information generated by the HEPMA system to produce an electronic discharge letter.
2005	A national project plan and timescales are not in place. Clinical leads for the HEPMA project have been appointed. A project manager has still to be appointed.

Source: Audit Scotland fieldwork and literature review

46 Presentation by Head of Computing and IT Strategy, SEHD, to Association of Scottish Trust Chief Pharmacists' conference, Stirling, November 2000.
47 *Draft budget 2005/06*, SEHD, 2005.

128. The SEHD has estimated the set-up costs of a national HEPMA system as £25 million, plus maintenance costs of £5 million per annum.[48] There has not been any agreement on what will be funded by the SEHD: national funds will meet the procurement costs, but boards may be expected to meet the running costs. Boards will need to make sure they have the necessary hardware, network, back-up and IT support in place.

Recommendation

- The SEHD should develop a clear project plan with key milestones and timescales for procuring, developing and implementing a national HEPMA system. The SEHD should work with NHS boards to ensure this is implemented in all NHS boards.

Good communication between hospitals and primary care is essential for high-quality patient care

129. When patients are admitted to hospital, staff need information about their medication history to understand their medical condition, ensure they continue to get their medicines in hospital and to be aware of any possible contraindications when they are prescribing new medicines. It is difficult to get reliable information about the medication history of patients admitted as emergencies, particularly out of hours and not following a referral from their GP. Prescribers may need to make decisions with no or only partial information. Some hospitals have introduced systems to improve communication on admission and discharge, for example:

- The Acute Sector, NHS Grampian, has allocated clinical pharmacy staff to improve the quality of immediate discharge letters, looking at information flows between primary and secondary care. At Woodend Hospital, the dispensary pharmacist routinely checks discharge prescriptions against individual patient profiles held by pharmacists to identify any anomalies.

- As part of a project to redesign how medicines are supplied, South Glasgow University Hospital Division sends a formal letter to the community pharmacist as part of the discharge information. This provides information on changes to medicines and issues that need to be followed up in the community. The standard discharge summary document includes a box for details of changes in medicines and the reasons for changes.

- Forth Valley Acute Hospitals Operating Division has developed a detailed discharge document and piloted it in paediatrics. This five-page document is transcribed from the inpatient prescription chart by the clinical pharmacist. It is updated throughout the patient's stay in hospital.

- NHS Lanarkshire has funded a paediatric clinical pharmacist whose remit includes improving working between primary and hospital care, including facilitating patient discharge. The post is based in the acute hospital division, but the Chief Pharmacist of the primary care operating division has input to setting the post-holder's objectives.

130. When patients are discharged, the primary care team need information about medicines used in hospital so that the patient continues to get new medicines and the GP has up-to-date information. As well as a list of medicines in use at the time of discharge, SIGN recommends that hospitals should also provide GPs with information on any medicines stopped or started during the patient's stay in hospital and the reasons.[49] This avoids the GP prescribing any of the medicines that were stopped and ensures that patients are continued on new medicines that they need.

131. All hospitals provide the GP with a discharge summary that includes information on the medicines the patient is taking on discharge. As Exhibit 20 shows, this information is mostly handwritten. This increases the chances of mistakes, with medicines being copied incorrectly.

132. An electronic summary with the information on medicines entered automatically from another system reduces the chances of error. Even when an electronic discharge summary is produced, this has to be entered into the GP records manually, again meaning that it may be copied incorrectly. Work is going on at national level to improve electronic communication between hospitals and primary care.

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48 *A report on Hospital Electronic Prescribing and Medication Administration*, (HEPMA), draft report commissioned by the Chief Pharmaceutical Officer. Issued for consultation by SEHD, 13 May 2004.
49 *The Immediate Discharge Document*, SIGN Publication No. 65, SIGN, 2003.

Exhibit 20
Systems in place to produce a discharge summary for primary care

Discharge information about medicines is transcribed manually.

	Number of NHS bodies
Electronic discharge summary in place in some wards.	7
Medicines information is entered on the electronic discharge summary automatically from other systems.	1
Discharge summary includes prompt to identify changes in medicines and reasons for changes.	3

Source: Audit Scotland fieldwork, November 2003-September 2004

Systems are developing nationally to allow hospitals and primary care to share electronic information

133. An electronic discharge summary is being developed as part of the Scottish Clinical Information (SCI) Programme, a national IM&T development. This is a national information depository that can be accessed by hospitals and primary care. One of the requirements to share information on medicines between hospitals and primary care is for all systems to be populated with the same drug dictionary. This is planned. As an initial stage, SCI Gateway is due to be available to transfer electronic referral and discharge letters by summer 2005. In the longer term, electronic patient records that provide all patient details, linked to the HEPMA system and accessible to primary care, will allow information to be shared.

134. The Emergency Care Summary has been developed to provide out-of-hours services with a summary of information extracted from the patient's GP records. This includes information on current medication, allergies and contraindications. It was piloted in two NHS boards in 2004/05 and is due to be rolled out across Scotland in 2005/06.[50] This has initially been developed for out-of-hours services, but will be extended to include accident and emergency, giving hospital prescribers access to information on the patient's medication history at the time it is needed. It is important that there is good communication between hospitals and primary care and that electronic GP records are kept up to date so that prescribers are working with accurate information.

Recommendations

The SEHD should:

- continue to prioritise IM&T developments to allow hospitals and primary care to share information about patients, particularly on admission and on discharge

- develop the Emergency Care Summary for use by hospital staff dealing with emergency patients out of hours, in addition to the out-of-hours service.

50 *NHSScotland Emergency Care Summary*, Dear Colleague letter from Chief Medical Officer, SEHD, 19 August 2004.

Part 6. Summary of recommendations

Part 2. Spending on medicines

NHS boards should:
135. Identify medicines where there is potential to move to cost-effective prescribing.

136. Develop joint formularies and treatment protocols that promote cost-effective prescribing, and monitor their use.

137. Ensure that horizon scanning information and monitoring information on the use of medicines is used to inform budgets for medicines.

138. Ensure that the medicines budget-holder has credibility and influence with prescribers.

139. Involve lead clinicians and lead clinical pharmacists in signing off the medicines budget.

Others:
140. The SMC should continue to develop its work on estimating the anticipated budget impact of new medicines, so that NHS boards are provided with information on all anticipated costs and cost savings. NHS boards need this information to estimate the local financial impact of new medicines.

141. SIGN guidelines should consider the cost-effectiveness of medicines when developing clinical guidelines.

142. SIGN guidelines, NICE technology appraisals reviewed by NHS QIS and NHS QIS HTAs that relate to medicines should include an assessment of the budget impact for NHSScotland.

143. The Medicines Utilisation Unit should work with the NCDDP at ISD, NHS QIS, SMC and ADTCs to develop a coordinated approach to collating data on medicines utilisation that can be used to review the effectiveness and cost-effectiveness of medicines.

Part 3. Support for prescribers

The SEHD should:
144. Establish a national working party to develop good practice in the use of unlicensed and off-label medicines.

NHS boards should:
145. Ensure there is coordination between the processes for implementing national clinical guidelines, NICE appraisals, NHS QIS HTAs and advice from the SMC.

146. Consider developing area-wide arrangements for dealing with clinical guidelines, NICE appraisals, and NHS QIS HTAs, to ensure a consistent approach between hospitals and primary care.

147. Raise awareness of the joint formulary and encourage staff to use it.

148. Consider developing a national framework to guide the process for developing local joint formularies.

149. Develop antibiotic prescribing strategies and put in place mechanisms to support these strategies, including education, clinical audit and feedback to staff.

150. Ensure that staff have up-to-date information on national and local guidance and policies, that they have easy access to this information and are encouraged to use it.

151. Ensure they have robust processes to review medication incidents and take actions to prevent a repeat.

152. Ensure that staff get regular information about medication incidents and the learning points from these incidents.

153. Ensure that staff are made aware of the need to report adverse reactions to medicines and monitor the level of reporting, using reports from CSM Scotland.

Others:
154. NHS QIS should develop a national approach to collecting data on adverse incidents, including medication incidents, to allow robust trend analysis, transferable lessons and benchmarking.

Part 4. Changing the delivery of care

The SEHD should:
155. Work with NHS boards to explore the potential benefits of using automation in hospital dispensaries.

156. Improve workforce planning for pharmacists and pharmacy technicians. The SEHD and NHS boards should ensure that workforce planning includes pre-registration pharmacist posts and that sufficient training posts are available to meet the future needs of the service.

157. Work with NHS boards and the pharmacy profession to develop meaningful measures of activity for pharmacy staffing to inform workforce planning.

158. Work with universities to review education in medicines and prescribing for medical students to ensure that it meets the needs of patients.

NHS boards should:
159. Ensure that implementation of the recommendations in *The Right Medicine* links with local pharmacy strategies.

160. Address as a priority the need to supply patients with original packs of medicines that include the manufacturer's PIL, to reduce risks to the patient and to meet the requirements of EU legislation. Original packs should be supplied on admission to meet the requirements of *The Right Medicine*.

161. Review clinical pharmacy services and develop plans to address gaps in the service.

162. Review the way that hospitals provide pharmacy services and identify opportunities to change working patterns and the skill-mix to give pharmacists and technicians more time to work with patients and staff in wards and clinics.

163. Work to nationally agreed standards for training technicians in extended roles.

164. Introduce standardised training in administering IV medicines, developed by NES.

165. Implement a system that records up-to-date information on the assessed skills and competencies of nurses and midwives, including bank and agency staff, in relation to administering medicines.

166. Develop policies to ensure that locum, bank and agency staff are not prescribing, dispensing or administering medicines without the appropriate induction and assessment of competency, whenever possible. They should also develop policies on the circumstances under which these staff can undertake tasks involving medicines.

Others:
167. Postgraduate tutors and NES should work together to ensure that postgraduate medical education in relation to medicines and prescribing meets the needs of patients.

Part 5. Information on the use of medicines

The SEHD should:
168. Clarify the timescale for moving to a national drug dictionary and for full roll out of the CHI number to inform other developments.

169. Develop a clear project plan with key milestones and timescales for procuring, developing and implementing a national HEPMA system. The SEHD should work with NHS boards to ensure this is implemented in all NHS boards.

170. Continue to prioritise IM&T developments to allow hospitals and primary care to share information about patients, particularly on admission and on discharge.

171. Develop the Emergency Care Summary for use by hospital staff dealing with emergency patients out of hours, in addition to the out-of-hours service.

NHS boards should:
172. Ensure that directorates receive regular reports on use of and expenditure on medicines. These reports should include commentary from pharmacy identifying reasons for changes and emerging pressures.

173. Encourage pharmacy departments to work with finance and IT departments to develop automatic reports, or work with a data analyst, so that it takes less pharmacist time to produce reports on use and expenditure on medicines.

174. Ensure that pharmacy is represented at the senior levels of decision-making in the NHS boards and operating divisions.

175. Review the reporting arrangements for ADTCs and PMGs to ensure that appropriate medicines issues get onto the board agenda.

Glossary

Adverse drug reaction (ADR)	A known potential side-effect or an unknown side-effect of a medicine.
Area Drugs and Therapeutics Committee (ADTC)	A committee responsible for providing advice to the NHS board on all matters affecting efficacy, safety and value for money in the use of medicines, to help meet the needs of the local population.
Clinical pharmacist	A pharmacist who provides pharmaceutical care for patients, working directly with patients in wards and other clinical areas.
Cost-effective prescribing	Prescribing a medicine that achieves the same patient benefit for less cost than an alternative medicine, or a medicine that achieves greater patient benefit than an alternative that costs the same.
Generic medicine	A copy of a medicine whose patent has expired.
Health technology assessment (HTA)	Evaluation of any intervention used to promote health; prevent, diagnose or treat disease; or provide rehabilitation or long-term care. This includes medicines.
Horizon scanning	The process of identifying new medicines or new uses of existing medicines that are expected to receive marketing authorisation from the Medicines and Healthcare products Regulatory Agency (MHRA), in the near future.
Independent prescribing	An individual with full prescribing rights. For some professions this applies to a limited list of medicines.
Integrated care record	A single electronic record that pulls together information from all sources. Integrated care records are planned at local, NHS board and national level, and they are also planned to share information between different agencies.
Joint formulary	A list of selected medicines, sometimes accompanied by advice and protocols for their use, compiled by hospitals, primary care and NHS boards.
Medication incident	A mistake or a near miss involving a medicine.
National drug dictionary	The NHS dictionary of medicines and devices contains unique identifiers and associated text descriptions for medicines and medical devices. It has been developed for use throughout the NHS to uniquely identify the specific medicines or devices used to diagnose and treat patients.

National Institute for Health and Clinical Excellence (NICE)	The independent organisation responsible for providing national guidance on the promotion of good health and the prevention and treatment of ill health for the NHS in England and Wales.
National Patient Safety Agency (NPSA)	A Special Health Authority of the NHS that was created in July 2001 to coordinate reporting across England and Wales and to coordinate learning from mistakes and problems that affect patient safety.
Off-label medicine	A medicine used for an indication for which it is not licensed.
Patient Information Leaflet (PIL)	The leaflet included by the manufacturer in packs of medicines. This details any potential side-effects of the medicine and any known contraindications to using the medicine.
Patient-pack dispensing	Providing patients with an original pack of medicines, either on admission or on discharge. This should ideally be supplied on admission so that the patient uses the pack during their stay in hospital and takes the remainder home if required.
Performance Assessment Framework (PAF)	Information on the performance of NHS boards in Scotland against agreed indicators. This is used by the SEHD as part of its Annual Reviews with NHS boards.
Supplementary prescribing	A voluntary partnership between an independent prescriber (a doctor) and a supplementary prescriber (eg, a nurse or pharmacist) to implement an agreed patient-specific Clinical Management Plan.
Technology appraisal	Recommendations on the use of new and existing medicines and other treatments within the NHS. These are based on a review of clinical and economic evidence.
The Right Medicine	The national strategy for pharmaceutical care published by the SEHD.
Unlicensed medicine	A medicine that does not have marketing authorisation from the MHRA.
Yellow Card scheme	The national system for reporting adverse drug reactions to the Committee on Safety of Medicines.

Appendix 1. Study advisory group

Susan Bishop	Chief Pharmacist	NHS Forth Valley Primary Care Operating Division
John Browning	Medical Director	NHS Lanarkshire
Michele Caldwell	Director of Pharmacy	NHS Ayrshire & Arran
Clive Gibbons	Head of IT	NHS Ayrshire & Arran
Dorothy Hughes	Deputy Chief Pharmacist	NHS Lothian University Hospitals Division
Gordon Jamieson	Director of Nursing	NHS Dumfries & Galloway
Norman Lannigan	Chief Pharmacist	NHS Lothian University Hospitals Division
Laura McIver	Principal Pharmaceutical Officer	Scottish Executive
Adrian Masson	Head of Corporate Secretariat	NHS QIS
Elizabeth Myers	Nurse Consultant	NHS Tayside Acute Services Division
Rose Marie Parr	Director of Pharmacy	NHS Education Scotland
Kenneth Paterson	Consultant Physician	North Glasgow University Hospitals Division/SMC
Keith Ridge	Chief Pharmacist	North Glasgow University Hospitals Division
Elizabeth M Robertson	Associate Medical Director	NHS Grampian Acute Sector
Vince Summers	Chief Pharmacist	NHS Borders
Angela Timoney	Consultant in Pharmaceutical Public Health	NHS Tayside/SMC

Appendix 2. NHS bodies reviewed

NHS board (12)	NHS body reviewed (15)
NHS Argyll & Clyde	NHS Argyll & Clyde
NHS Ayrshire & Arran	General Hospitals Operating Division
NHS Borders	NHS Borders
NHS Dumfries & Galloway	NHS Dumfries & Galloway
NHS Fife	Fife Acute Hospitals Operating Division
NHS Forth Valley	Forth Valley Acute Hospitals Operating Division
NHS Grampian	Acute Sector
NHS Greater Glasgow	North Glasgow University Hospitals Operating Division South Glasgow University Hospitals Operating Division Yorkhill Operating Division
NHS Highland	NHS Highland
NHS Lanarkshire	Lanarkshire Acute Hospitals Division
NHS Lothian	Lothian University Hospitals Division West Lothian Healthcare Division
NHS Tayside	Tayside Acute Services Division

A Scottish prescription
Managing the use of medicines in hospitals

AUDIT SCOTLAND