

**Long term conditions: Integrating community pharmacy's  
contribution**

**Report 1**

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## Introduction

The Royal Pharmaceutical Society of Great Britain has been working with the Department of Health (England) to identify how pharmacists can contribute to the care of people with long-term medical conditions.

In October 2005 the RPS commissioned work to develop a resource that brings together evidence on the community pharmacist's contribution to the management of long term conditions and options for mainstreaming via the new community pharmacy contracts. The resource is intended for use by commissioners, and by individual community pharmacists and providers of services. The development of the resource is structured in three phases:

1. Rapid review of evidence and collection of innovative practice examples, set out in this document
2. Stakeholder consultation and in-depth case studies
3. International experience and options for mainstreaming

The objective of this, the first phase of the work, is to collate and present evidence and practice examples on community pharmacy's potential contribution that have been gathered from the literature and through consultation with stakeholders.

## Background

There is increasing emphasis on improving care and services for people with long term conditions. The new community pharmacy contracts in England, Wales, Scotland and Northern Ireland provide an opportunity to develop the contribution of the community pharmacist to management of long term conditions.

The new contracts for community pharmacy are part of a wider programme to modernise primary care contracts, and it has been suggested that there is the potential to link the General Medical Services (GMS) contract and the CP contracts at a local level so that services are integrated. The management of long term conditions provides an ideal opportunity to integrate two contracts.

In considering the potential contribution of community pharmacy it is important to attempt to quantify and reflect on the patient profile served by community pharmacy. Data from disease registers in general practices has enabled a calculation of national prevalences for a range of conditions:

<b>Disease Area</b>	<b>National Prevalence</b>
Coronary Heart Disease (CHD)	3.6%
Left Ventricular Dysfunction (LVD)	0.4%
Stroke	1.5%
Hypertension	11.3%
Diabetes	3.3%
Chronic Obstructive Pulmonary Disease (COPD)	1.4%
Epilepsy	0.6%
Hypothyroidism	2.2%
Cancer	0.5%
Mental Health	0.5%
Asthma	5.8%

(based on 53,000,000 people registered with 8,486 practices) HSCIC 2005

While this will vary according to local demographics the average community pharmacy in the UK<sup>1</sup> can expect to have<sup>2</sup>:

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<sup>1</sup> At April 2004 there were approximately 10,500 community pharmacies in England and Wales, and 1150 in Scotland (DH Bulletin on General Pharmaceutical Services 2005).

<sup>2</sup> Asthma UK 5.2mill UK = 452 per pharmacy; Diabetes DH 1.8 mill = 156; Angina DH 1.4 mill = 122; Heart attack DH 275,000 annually = 24; Hypertension 16 mill DH = 1390; Heart failure 900,000 = 78; COPD 900,000 diagnosed = 78; Epilepsy Action 456,000 =40)

Asthma	452 patients
Diabetes	156
Angina	122
Heart attack (annual)	24
Hypertension	1390
Heart failure	78
COPD	78
Epilepsy	40

Work commissioned by the Department of Health, based on a sample of 500 practices, suggests that 32.6% of patients with any of these 11 conditions suffer from co-morbidity in respect of this set of diseases (HSCIC 2005).

**Priority therapeutic areas**

Long term conditions encompass a broad range of conditions which are likely to have an enduring effect or require indefinite treatment and management. For the purposes of this report we have focussed on three therapeutic areas; asthma, coronary heart disease (CHD) and diabetes. In this report we present a summary for each of these three areas in which we set out the problem (Problem statement); the policy background relating to England (policies on LTC in the three GB countries will inevitably be different but LTC are a major public health concern in all three countries); summary of published evidence; and practice examples.

Our work is also focused on the contribution of the community pharmacist, however in the course of our work we have identified and included examples from hospital and primary care pharmacy alongside those for community pharmacy where we felt these were relevant.

## Methods

This interim report focuses on three therapeutic areas which were prioritised through a consultation process involving key stakeholders from pharmacy, general practice, nursing, NHS management, the Department of Health and HM Treasury. This consultation process identified the following therapeutic priorities for this phase of our work:

- Asthma
- Coronary Heart Disease
- Diabetes

Having identified the priority areas, the following methods were used to identify practice examples:

- Rapid review of UK and international published literature
- Hand searching of UK pharmacy journals for practice examples
- Request to key contacts for brief details of practice examples

Data from the published literature were extracted and assessed using standard techniques. A narrative summary of evidence was produced for each therapeutic area.

Practice examples were collated into a structured matrix (see Appendix 1).

To provide some context we have presented anonymous data aggregated from a baseline survey undertaken with 272 community pharmacies in England between June 2004 and August 2005. These baseline surveys were conducted by Webstar Health on behalf of PCTs undertaking a pharmaceutical needs assessment.

For the purposes of this report we have extracted information relating to pharmacists attitudes to greater involvement in the management of long term conditions and the support that the respondents felt they needed to provide the service.

## Criteria

Previous reviews of evidence for the potential contribution of pharmacy to wider health priorities found that although peer reviewed published literature provided some evidence, important evidence (Anderson, Blenkinsopp and Armstrong 2003a; 2003b) was also found in the grey literature, filling gaps in the peer reviewed literature.

With this in mind we purposefully sought to use a combination of search techniques to identify examples of innovative practice. Our search was focused on the three priority therapeutic areas, and on community pharmacy. However we also found or received examples for other therapeutic areas or policy which we tested against a set of simple criteria for this work.

Our criteria were that the practice example should:

- Address a specified morbidity or multiple morbidities e.g. Diabetes or polypharmacy)
- Include the pharmacist in an active role supporting the patient and or clinician to manage a specific patient
- Involve an innovative service development which has not yet been mainstreamed

## Asthma

### Overview:

- The average community pharmacy serves around 450 people with asthma
- We found and reviewed ten intervention trials of community pharmacy-based asthma services
- Most trials showed positive effects
- The most effective use of community pharmacy resources will be to focus on those whose asthma is less well controlled
- Several models of community pharmacy based asthma care are offered in the UK, usually on a pilot basis
- Community pharmacists have identified asthma as an area in which they would like to offer a more clinical service

### Problem statement

Asthma UK's review of asthma in the UK tells us that 5.2m people in the UK suffer from asthma of these 700,000 are aged over 65. The number of people with asthma has grown by 400,000 since 2001. Diagnosis of asthma is growing fastest among adults with growth in children slowing when compared to historical trends. We do not know why this is happening. Nevertheless one in ten children and 590,000 teenagers have a diagnosis of asthma. There are around 4.1 million GP consultations each year for asthma, 6% of sufferers reported having emergency treatment in last month with 69,000 hospital admissions due to asthma. Each year there are 1,400 deaths from asthma.

### Policy Context

There is no National Service Framework for asthma, although the principles of the Long Term Conditions strategy apply. Asthma is included in the General Medical Services (GMS) Quality and Outcomes Framework (QOF). The indicator measures "the percentage of patients with asthma who have had an asthma review in the last 15 months" with payment triggered when 70 per cent of those on the register have had a review.

## Summary of published evidence

There was no previous substantive review of studies of community pharmacy based asthma services. We identified and reviewed ten studies, most of which were conducted in Europe, Canada and the US (see Appendix 2), together with a 2003 review article which conducted a detailed analysis of four studies (McLean and MacKeigan 2005).

Almost all of the studies showed positive effects on patients' self-reported symptoms and some showed improvements in asthma-related quality of life. Fewer studies demonstrated significant improvements in Peak Expiratory Flow Rates

Variance between the results from subjective and objective clinical measures is not uncommon. In clinical practice the Royal College of Physicians recommends the use of three routine questions to patients to identify sub-optimally controlled asthma. These three questions are based on the 'subjective' but are used pragmatically by clinicians as the basis for discussion about how treatment is being used by the patient and whether any changes might be needed. Therefore the findings of the pharmacy based studies are relevant to real life practice in asthma management.

Three questions used to identify sub-optimally controlled asthma:

In the last week (or month):

- Have you had difficulty sleeping because of your asthma symptoms (including cough?)
- Have you had your usual asthma symptoms during the day (cough, wheeze, chest tightness or breathlessness?)
- Has your asthma interfered with your usual activities (eg. housework, work/school etc.?)

*Measuring Clinical Outcome in Asthma: A Patient-Focused Approach. Department of the Royal College of Physicians, 1999*

In considering the evidence for the contribution of pharmacists to management of long term conditions we believe it is also important to review the evidence for other relevant primary care professionals, in this case nurses. There are surprisingly few trials of nurse led asthma clinics in primary care. There are two UK studies, neither of which used the methodology of a randomised controlled trial and both used a cohort method. Both of these studies concluded that a nurse-led clinic was beneficial. An Australian RCT tested an intervention involving three nurse-led asthma clinic sessions over six months involving nurse

counselling, education about asthma management, spirometry and consultation with the general practitioner against standard general practice care and showed benefit from the intervention.

### **Practice examples**

**Identifying sub-optimal asthma control:** Lloydspharmacy, in partnership with Asthma UK, co-ordinated a targeted approach in which their pharmacists identified people whose asthma was less well controlled and offered them a Medicines Use Review. The results from 200 pharmacies showed that over half of the people for whom a MUR was conducted were using their reliever inhaler too frequently. Just over two thirds of the patients whose asthma was sub-optimally controlled were referred to their GP. Changes to prescribed treatment to improve asthma control were made in almost two thirds of these cases.

**Supplementary prescribing:** A community pharmacist is providing a walk-in ad hoc supplementary prescribing clinic for asthma patients. GPs will offer the service at patient appointments. Pre-prepared clinical management plans provided by the pharmacist incorporating steps 1-3 of British Thoracic Society (BTS) guidelines will be used. The pharmacist has developed his own notes system based on that used by asthma nurses in the local practice so that the notes are in a format that the doctors are used to seeing. He plans to visit the surgery before each clinic to check the patient's medical record for any recent additions.

For further examples see Appendix 1

### **Pharmacist' attitudes on future service provision**

In the baseline survey of community pharmacists, 178 (65%) expressed an interest in specialising in the management of long term conditions. Of these 8% expressed an interest in specialising in the management of asthma.

## Coronary Heart Disease

### Overview:

- The average community pharmacy serves 122 people with angina and has 24 people each year needing treatment following a heart attack.
- The published literature includes several trials of community pharmacy-based services which aim to reduce risk factors for CHD
- There is good evidence that community pharmacy based services result in improved lipid levels and more patients reaching lipid targets
- There is some evidence that pharmacy services can improve blood pressure control
- Point of care testing for blood pressure and lipids is increasingly offered in community pharmacies but connectedness with the wider NHS is unclear
- We found one point of care testing service (the Greater Manchester SHA project) which could serve as a model for future developments
- Community pharmacists identified CHD as an area in which they would like to offer a more clinical service

### Problem statement

Coronary heart disease (CHD) kills more than 110,000 people in England every year. More than 1.4 million people suffer from angina and 275,000 people have a heart attack annually. Around 41,000 of these deaths are premature, occurring in people under 75.

South Asian people born in India, Bangladesh, Pakistan or Sri Lanka are 50 per cent more likely to die prematurely from coronary heart disease than the general population of the UK. In addition, the difference in the death rates between South Asians and the rest of the population is increasing because the death rate from CHD is not falling as fast in South Asians as it is in the rest of the population (DH 2004). Diabetes is up to six times more common in South Asians than in the general population. As well as suffering from higher rates of heart disease, there is evidence to suggest that Asian communities tend to be diagnosed at a more advanced stage of disease and have poorer survival rates.

## Policy Context

The Westminster Government is committed in the National Service Framework for CHD to reducing the death rate from coronary heart disease and stroke and related diseases in people under 75 by at least 40% (to 83.8 deaths per 100,000 population) by 2010.

CHD is included in the General Medical Services (GMS) Quality and Outcomes Framework (QOF). In the first year of nGMS practices were most successful at achieving the targets associated with hypothyroidism and coronary heart disease (CHD) and least successful with chronic obstructive pulmonary disease (COPD) and epilepsy (HSCIC 2005). In relation to CHD:

- 71% of patients with CHD who were available and suitable for treatment had a last measured cholesterol level (measured in last 15 months) of 5mmol/l or less
- 90% of patients with CHD who were available and suitable for treatment have a record in last 15 months that aspirin, an alternative anti-platelet therapy, or an anti-coagulant is being taken
- 63.3 % of patients with CHD who were available and suitable for treatment are currently treated with a beta blocker
- 71.3 % of patients with hypertension who were available and suitable for treatment showed a last blood pressure reading (measured in the last 9 months) of 150/90 or less (figures from DH 2005)

These figures suggest that there is scope for pharmacists to contribute to CHD management.

## Summary of published evidence

An earlier review of studies published between 1990 and 2001 included four studies of community pharmacy based hyperlipidaemia management (2 RCTs and 2 observational studies) (Anderson, Blenkinsopp and Armstrong 2003). That review concluded that *“The RCTs provide convincing evidence, supported by the other studies, that community pharmacists have an important role to play in managing lipid levels. Community pharmacists offer the potential to improve the use of the resources invested in and the outcomes of lipid management”*. We identified four further more recent studies, one of which was the final publication of an RCT included in the original review (see Appendix 3).

There is good evidence from intervention studies in hyperlipidaemia that community pharmacy based services result in more patients reaching their target lipid levels.

There is also evidence that primary care nurse intervention has positive effects on the care of CHD patients. Beneficial effects attributable to nurse-led clinics were shown for reduction in severity of angina, blood pressure, cholesterol levels, adherence to medication schedules, and lifestyle changes to decrease the severity of risk factors. Of these, only blood pressure and cholesterol were objectively measured (Page et al 2005).

### Practice examples

**Point of care testing:** Twenty-two pharmacies across the Greater Manchester Strategic Health Authority are regularly monitoring patients with diabetes and/ or coronary heart disease. This pilot is sponsored by the Department of Health and supported by Pharmacy Alliance. Participating pharmacies include independents, regional multiples and national multiples. The pharmacists complete a specific training programme and the premises facilities have been upgraded with NHS support. Patients can choose whether to continue using existing services or the new services. Those that choose the pharmacy option are contacted by their pharmacist and then invited for an initial consultation. A patient history is taken and tests are performed prior to a consultation between the pharmacist and the patient. Measures regularly taken include:

- Total cholesterol/ high density lipoprotein [HDL]/ triglycerides and low density lipoprotein [LDL] (calculated)
- HbA1c
- Blood pressure
- Weight (height), BMI and waist measurement

The consultation covers the impact that medication, lifestyle, diet and activity can make on the patient's condition and uses the test results to illustrate what changes can be made. A traffic light system relating to the test results indicates the frequency of consultations: all patients will be seen at least twice a year. In exceptional circumstances, the pharmacist may need to refer the patient back to their GP for urgent review. The pilot aims to promote greater collaboration between community pharmacists, GPs and other local healthcare providers. Data gathered in the consultation are entered into an online IT system that inserts the information into the patient record and the GP's quality and outcome framework (QOF) record.

Equipment selection, staff training, quality control, external quality assurance and performance management all form part of a governance system that ensures good quality and good oversight by involved stakeholders.

**Supplementary prescribing:** A community pharmacist in Forth Valley, Scotland is running supplementary prescribing clinics for CHD patients on complex

medication regimens. Patients are referred by the GP practice, which is moving to the pharmacy building once it has been extended. Patients are treated according to an agreed clinical management plan. The pharmacist will measure blood pressure, recommend any blood tests needed and adjust medicines as appropriate. Patients are signed off from the pharmacist's care once they have reached agreed therapeutic goals.

For further examples see Appendix 1

### **Pharmacist' attitudes on future service provision**

178 (65%) pharmacies expressed an interest in specialising in the management of long term conditions. Of these 4% expressed an interest in specialising in the management of CHD.

21% of pharmacies were ready and willing to provide a CHD management service at the time of the survey. Respondents that were willing to provide but not yet able to provide this identified training (49%), equipment (21%) and premises (21%) as prerequisites to commencing the service.

32 % of pharmacies currently provide a blood pressure testing service with 6% planning to introduce one in the next 12 months. 11% of pharmacies currently provide a cholesterol testing service with 7% planning to introduce one in the next 12 months.

## Diabetes






### Overview

- The average community pharmacy serves 156 people with diabetes, 133 of whom have Type 2 diabetes
- The average pharmacy can expect to have 9 newly-diagnosed patients with Type 2 diabetes each year
- The published literature includes several trials of community pharmacy-based diabetes services
- The results of the trials are mixed but most of those which measured diabetes control showed positive effects
- We found one pharmacy based diabetes care service in the UK (the Hillingdon service) with a robust evaluation.
- Both the trial results and the evaluation of the Hillingdon service indicate that the most effective use of community pharmacy resources will be to focus on those whose diabetes is less well controlled
- Community pharmacists identified diabetes as an area in which they would like to offer a more clinical service

### Problem statement

There are an estimated 1.8 million people in the UK with diabetes, 250,000 of whom have Type 1 and 1.5 million have Type 2 diabetes (DH 2005 Improving diabetes services; Diabetes UK 2005). Between 765,000 and 1 million people are thought to have undiagnosed Type 2 diabetes. Between 1996 and 2004 the number of people with diabetes increased from 1.4 to 1.8 million. Each year 100,000 people are diagnosed with Type 2 diabetes in the UK. People from black and minority ethnic communities are six times more likely to develop the disease, suffer from a 50% increased risk of heart disease and have much higher levels of kidney disorders. One in four people with diabetes also have three or more other long-term conditions.

**Estimated diagnosed diabetes by Type and country for the UK**

Nation	Type 1	Type 2	Total
 England	200,000	1,280,000	1,480,000
 Scotland	18,000	130,000	148,000
 Wales	12,000	80,000	92,000
 Northern Ireland	7,000	40,000	47,000
 United Kingdom	237,000	1,530,000	1,767,000

Source: Diabetes UK 2005

The average pharmacy can expect to have 113 patients with diabetes, 90% of whom will have Type 2 diabetes.

**Policy Context**

Diabetes has been the subject of a National Service Framework (DH 2003) and is one of the clinical areas in the Quality and Outcomes Framework within the

General Medical Services contract. Within the QOF the target is that the percentage of patients with diabetes in whom the last HbA1C is 7.4 or less is 50%. Although the detailed data are not available to show to what extent this target was exceeded the QOF target indicates that considerable scope remains for pharmacists to contribute to diabetes care.

A key building block to support workforce development has been Phase 1 of the Diabetes Competence Framework, which was launched in October 2004. This focuses on the routine management of people with diabetes and provides a practical set of tools. It has already been used to develop job descriptions and identify training needs for health care assistants working in a variety of diabetes settings.

### **Summary of published evidence**

In addition to a recently-published review of community pharmacy based diabetes care (Blenkinsopp and Hassey 2005) we identified three more recent studies plus an evaluation report on one of the studies in the original review (see Appendices 4 & 5). Thus in total ten intervention studies were included, six of which measured diabetes control using HbA1C levels. Three of the studies that measured control of diabetes also measured reduction in CHD risk factors, particularly hypertension and total cholesterol.

Four of the five studies that measured diabetes control using a comparison with a control group found a significant improvement. The remaining study used a before and after comparison in the same patients and found that around half of those patients achieved control of their diabetes by the end of the study.

### **Practice examples**

**Screening for diabetes:** Community pharmacists in the Durham Dales PCT area provide a service which identifies people at risk of diabetes. Where needed, referrals are made to GPs and other health professionals locally. Almost half of the first 100 patients screened were invited back for a second visit as their results showed they were at moderate risk of diabetes.

**Enhanced monitoring:** Community pharmacists in the Sunderland area interview long term respiratory and diabetic patients at intervals to monitor symptom control, check and encourage compliance and check and correct device technique. Report findings to GP or relevant nurse.

**Patient education for self regulation of medicines:** A project aimed at improving blood pressure control in people with diabetes who have uncontrolled hypertension, through self-monitoring of blood pressure and self-regulation of medication. Patients involved in the study receive support in self-monitoring and self-adjustment of medication from 4 specially trained community pharmacists, who are also doing the supplementary prescribers course.

For further examples see Appendix 1

### **Pharmacist' attitudes on future service provision**

178 (65%) pharmacies expressed an interest in specialising in the management of long term conditions. Of these 40% expressed an interest in specialising in the management of Diabetes.

24% of pharmacies were ready and willing to provide a diabetes management service at the time of the survey. Those that were willing to provide but not yet able to provide this service identified training (49%), equipment (19%) and premises (24%) as prerequisites to commencing the service.

18 % of pharmacies currently provide a diabetes testing service with 8% planning to introduce one in the next 12 months.

## Implications and next steps

**1. The review of published evidence and practice examples shows that community pharmacy based services could contribute to improving care for people with asthma, CHD and diabetes.** A conclusion of a recent review of how to make further improvements in diabetes care, for example, was that "Medication management is central to most patients' care and pharmacists may plan an important role in achieving physiologic targets" (Piette 2005). The key question for both commissioners and providers is how to maximise this potential.

**2. A key issue in developing the community pharmacy contribution to long term conditions management is how to do so without duplicating work being done in general practices.** It is important to recognise the community pharmacy is working within a complex system where patients may, at any one time, be managed by their GP, practice nurse and / or a consultant. Avoiding duplication of effort is important if we wish to ensure that NHS resources are used effectively and that the contribution of the community pharmacist is seen as relevant and integrated.

**3. It is important that services commissioned from community pharmacy are integrated and planned within the local network of services to support patients with long term conditions.**

**4. Focusing the pharmacist's efforts on patients whose condition is not optimally controlled would provide the most effective use of resources and would minimise duplication of effort.** Within any cohort of patients we expect to find a range of patients from those that are well controlled through to those who are poorly controlled; and those with relatively simple presentation of the condition through to those that have complex problems. It is possible to segment patients and to target support appropriately taking account of the work of others.

Such an approach, with community pharmacists focusing on patients who are less well controlled could work well with nGMS/QOF if GPs could agree that these patients are those who could benefit most from community pharmacist intervention because of pharmacists' specialist knowledge of the medicines involved. This would make good use of the pharmacist's knowledge and skills, and would enhance the resource available to the practice.

**5. However identifying patients who are poorly controlled currently presents a particular challenge to the community pharmacist.** For some conditions, for example asthma, this could be achieved using questions to the patient as a means of identifying those who need further support. For asymptomatic conditions such as diabetes pharmacists need access to the patient's test results, or to conduct point of care testing to focus their input. This implies that pharmacists will need not only to be connected to the information systems but that they will require the rights to access relevant information.

**6. A strategic decision on whether point of care testing in pharmacies should be more widely implemented will be a key issue.** The argument for extending this role is supported by the agenda to increase care outside hospital, introduce choice for patients and to encourage greater plurality of provider in the primary care setting. The advent of Practice Based Commissioning and Case Management provide an opportunity to develop this further however it is too early to say if these policies will result in widening from the traditional models in general practice and opening up opportunities for community pharmacy.

**7. The future development of the community pharmacy contract in England and Wales will be a key factor in the extent of community pharmacists' involvement in long term conditions.** The Advanced Services component of the contract, for example, offers an opportunity to implement certain services on a national basis. The Advanced service Medicines Use Review could be one vehicle to introduce a more systematic approach targeted to patients in need of support.

Furthermore developing local enhanced services around specific diseases or common medicines management issues that are initiated by a Medicines Use Review would provide a joined up service which integrates the national and local aspects of the new contracts in England and Wales.

There are some issues about development of future services to support people with LTC that need to be discussed further. For example little is yet known about how well matched community pharmacists' personal preferences for working in particular therapeutic areas and their aspirations to be involved in LTC are with local population health needs. If they are not well matched, consideration needs to be given to how any gaps might be addressed. Evidence from supplementary prescribing suggests that pharmacists are willing and able to modify their preferences to match population needs.

In addition to providing services face to face in the pharmacy there is also a need to consider services for older people with LTC who are receiving home care, plus those who are in care homes (perhaps involving up to 1.5 million people in England). Domiciliary visiting is one method and although resource intensive, could be justified for some patients with complex needs. However it is unlikely to be the most cost-effective method for all patients in these groups. Developing new methods to provide outreach from the community pharmacy, including telephone consulting by the pharmacist and, in the longer term, advice via videophone, digital television and email, will be important. There are existing models for such services, such as Kaiser's 'home' nursing service in California, driven by a shortage of nurses to visit elderly patients with LTC.

The community pharmacy contract already includes pharmacist supplementary prescribing as an enhanced service. Independent prescribing, Pharmacists with a Special Interest and Consultant Pharmacists could contribute increasingly in the future, particularly for complex cases.

**8. Patients' views and preferences must be incorporated into the development of community pharmacy services relating to long term conditions.** This is an area which will be included in Phase 2 of this work.

## Criteria for success

From the literature review we were able to identify criteria that appear to contribute to successful services. McLean and colleagues cited several features they believed were associated with their successful service for people with asthma (McLean et al 2003). We believe them to be transferable to other therapeutic areas and have adapted them below:

- pharmacist assesses patient's readiness to change and adjusts start date for the intervention where necessary
- pharmacist provides education on disease, helps identify key issues (eg triggers in asthma) and works with patient to develop action plan for self management
- the patient participates in all decisions (eg where the pharmacist intends to make a recommendation about a change in treatment)
- patient monitors own therapy (eg in asthma Peak Expiratory Flow Rates - PEFRs, using calendar/diary)
- pharmacist takes responsibility for outcomes and promotes evidence-based care
- pharmacist-patient interaction is based on appointment and occurs in a private consultation area
- physician is informed or consulted regarding all test results and interventions

In addition to these criteria we identified several other features of successful services from the published literature:

- Multidisciplinary involvement
- Externally recognised certification of programme (eg West et al suggest that receiving ADA (American Diabetes Association) Recognition was key to the success of their service because it gave the programme more credibility with doctors and potential payers (West et al 2003).
- Acceptance by referring doctors (requires credibility of both pharmacist and service processes, leading to development of trust with successful patient outcomes)
- Effective marketing to doctors and patients
- Reimbursement by health insurance companies or other payers

It is noteworthy that most published studies focus on the input of the pharmacist and do not mention the involvement of other pharmacy staff. However research on innovation in community pharmacy (Tann and Blenkinsopp 2003) identified that the 'pharmacy as a practice' rather than as a single pharmacist, was critical to sustaining innovation in service delivery. Only one robustly evaluated pharmacy service for people with long term conditions describes and explains the roles played by non-pharmacist staff (Pharmacy Alliance 2005).

## **Draft Good Practice Criteria for Community Pharmacy Long Term Conditions Support**

As part of Phase 2 of this work we plan to follow up a sub-set of the practice examples to obtain further data that will increase our understanding of the features of successful services.

In order to collect the sort of data that will enable us to make an assessment of the quality of practice examples we have adapted a US model of Good Practice Criteria which was developed to assess examples of community pharmacy-based diabetes (Knapp et al 2005). We also used a set of criteria published by NICE as a framework for collecting data on practice examples, and drew on the criteria for success identified from our review of the literature. The criteria, which are set out below, will be reviewed with our stakeholders as part of the mainstreaming discussions taking place in Phase 2 of our work. These criteria are in draft form and we include them here as the basis for discussion.

### **Collaborative Practice Agreements with GPs**

*"A collaborative practice agreement is a voluntary, written agreement between a pharmacist and a prescriber that permits expanded authority for the pharmacist, such as the ability to initiate or modify drug therapy and order laboratory tests. Collaborative practice agreements are intended to optimize patient care outcomes, and may include protocols, practice guidelines, care plans and formulary systems". (American Society of Consultant Pharmacists 1997)*

An agreement exists between the GP/s and the pharmacist that sets out the broad scope, objectives and outcomes for the service. There is a shared understanding of the role and contribution of the community pharmacist, which is integrated with the work of the GP and other clinicians. This agreement allows the pharmacist to work autonomously, becoming established as a trusted and reliable source of information and support. The pharmacist will make significant contributions to patient care, communicating frequently and acting as a bridge between the patient and their GP.

### **Connectedness – with wider community and professional networks**

The pharmacist's work is informed by and takes account of the work of others, including patient groups, professional networks and charities. The pharmacist is

active in local networks and shares the outcomes of their work within that network. Everyone who should be aware of the pharmacists work is aware.

### **Documented objectives, management arrangements and outcomes**

The pharmacist should take a methodical and problem based approach to developing the service, this should include clearly expressed inclusion criteria with clinical and patient centred objectives.

### **Reimbursement strategies**

In order for a service to be sustainable the work should be adequately and appropriately remunerated: this includes developing realistic and sustainable budgets and fully costing the service.

### **Physical environment**

The physical environment should be suitable for the work being undertaken. This includes ensuring adequate space, privacy, trained staff, materials and equipment.

### **Patient education**

The service should recognise that patient education is an essential component of successful treatment and should embrace the principles of a patient centred approach to management and treatment of long term conditions.

### **Patient education materials should be evidence based or based on validated content**

Materials and aids to educating patients should make use of existing sources that are recognised as being of appropriate quality.

### **Multi-disciplinary involvement in patient education**

Where relevant, other professionals should be involved in patient education, for example dietitians and nurses in diabetes education.

### **Pharmacist Training in disease management**

The pharmacist/s providing the service should be able to demonstrate their competence. Possible options for this include completion of existing training programmes run by recognised providers. Development of competence frameworks within the NHS should provide a benchmark for the future (for example, the work done by the National Patient Safety Agency on anticoagulation).

## **Clinical Governance**

The pharmacist should be able to demonstrate how the principles of clinical governance are applied within the service.

## **Evaluation**

The outcomes for the service should be agreed at the outset and a structured evaluation designed to address each outcome measure. The views and experiences of patients should be routinely incorporated.

## **Replicability**

The service should be tailored to local needs and take account of local arrangements but should also be designed to be rolled out and replicated where there is a need to do so.

## **Information management and technology**

The service should make use of information technology to record and manage information, clinical data and communications. This should support the pooling of data to demonstrate outcomes and the evaluation of the service.

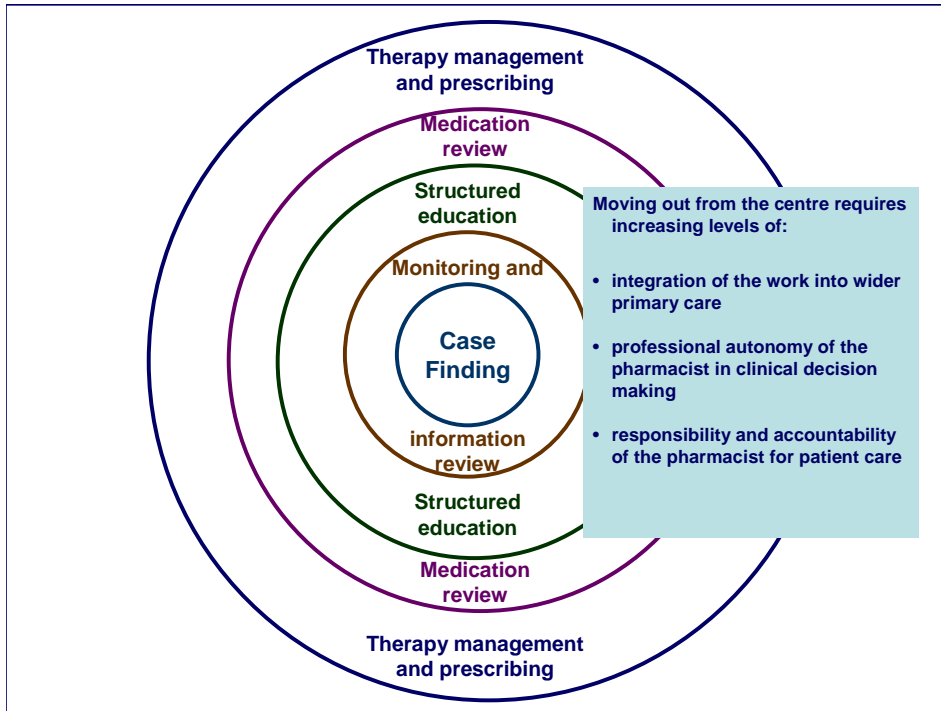
## **Maturity**

The service must demonstrate a minimum duration of 6 months.

## **Targeting of community pharmacy resource**

The findings of this review strongly indicate that effective targeting of community pharmacy resource will be essential.

Based on our analysis of published and practice evidence we have developed a model of the pharmacy contribution to long term conditions (Fig 1 below).



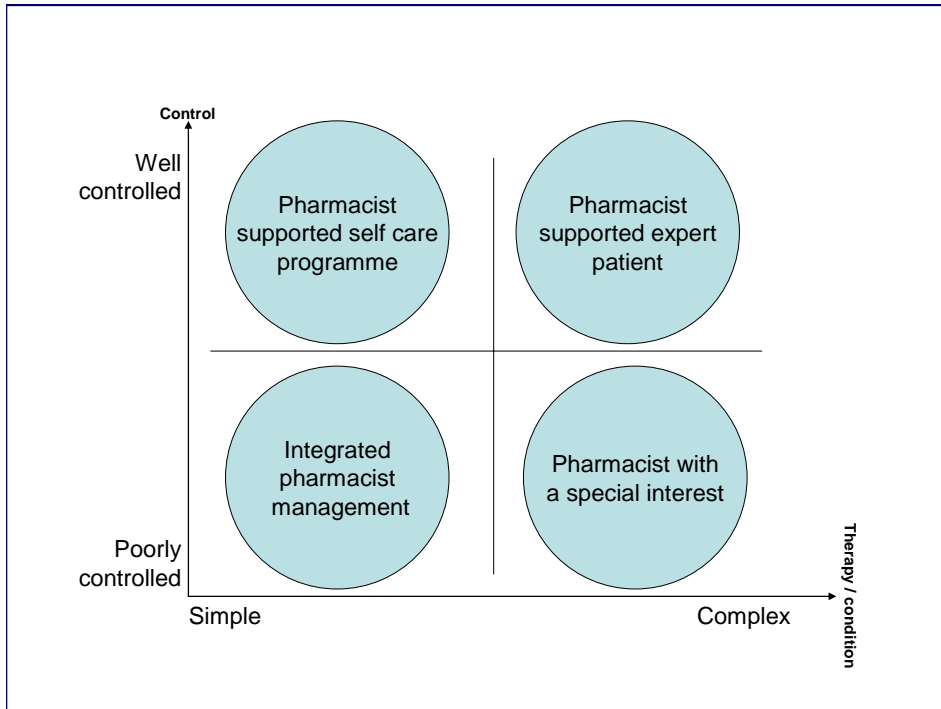
**Fig 1. Model of the pharmacist's contribution to long term conditions**

In this visual representation activities further from the centre require increasing levels of:

- integration of the work into wider primary care
- professional autonomy of the pharmacist in clinical decision making
- responsibility and accountability of the pharmacist for patient care

From the practice examples identified to date there is considerable clustering of practice examples towards the centre of the circle.

In considering how best to target the community pharmacy resource our work so far indicates that there should a focus on patients' whose condition is not optimally controlled. In the matrix below the quadrants represent relative control against relative complexity of treatment (Fig 2).



**Fig 2 Matrix to segment and target community pharmacy input**

The matrix can be used to map possible service contributions from community pharmacy and other pharmacy providers (primary care pharmacists, Pharmacists with a Special Interest). From our list of practice examples in Appendix 1, for example, the Parkinsons Disease example sits in the bottom right quadrant.

## Moving towards mainstreaming

Our review leads us to raise the following questions:

- What levers and incentives might be applied to move forward on mainstreaming the contribution of community pharmacy to the management of long term conditions?
- What are the barriers to mainstreaming community pharmacy's contribution?
- What priority actions are needed to move forward and who needs to be involved?
- What levers and incentives could be used to create Collaborative Practice Agreements between general practices and community pharmacies?

- What gives the community pharmacy long term conditions 'offering' credibility with potential commissioners, including GPs, primary care organisations, practice based commissioners?

In report 2 we explore the views of stakeholders within and external to pharmacy on these five key questions.

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Bimpe Adejuyigbe extracted data from the published studies for the literature review, from which AB produced the summary tables in this report. Bimpe also conducted hand searches of UK pharmacy journals to identify the preliminary set of practice examples.

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Caroline Kelham, Medicines Partnership

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Alison Jones, Lloyds Pharmacy

Beth Taylor, Lead on Pharmacists with a Special Interest, Department of Health, England

Richard Seal, National Prescribing Centre

Georgina Craig, Company Chemists Association

Nicola Roe, Rowlands Pharmacy

## Appendix 1: Practice Examples

Therapeutic Area	People Involved	Objectives/Service	Contact	Source
Asthma	200 Lloyds Pharmacy stores in England and Wales	Asthma monitoring service in conjunction with Asthma UK at 50 stores in England. Consists of a 10 min consultation with pharmacist covering inhaler technique, medicines management and lifestyle advice	Clare Kerr  Clare.Kerr@lloydspharmacy.co.uk	Asthma UK
Asthma	50 community pharmacies across England	Asthma monitoring service in conjunction with Asthma UK at 50 stores in England. Consists of a 10 min consultation with pharmacist covering inhaler technique, medicines management and lifestyle advice	Boots the Chemist  Tracey.Thornley@boots.co.uk	Asthma UK
Asthma	8 pharmacists	Offered initially by 8 pharmacists. Involves pharmacists developing an asthma action plan for patients, reviewing and educating the inhaler technique, and monitoring the patient over a six-month period.	Elaine Hartley  Senior Manager Professional Services  elaine.hartley@alliancepharmacy.co.uk	Astra Zeneca
Asthma	Community pharmacist	Ad hoc supplementary prescribing clinic for asthma patients from Sept 05. GPs will offer service at pt appointments. Pre-prepared clinical management plans provided by the pharmacist incorporating steps 1-3 of BTS guidelines will be used. Has developed own notes system based on that used by asthma nurses so that the notes are in a format that the doctors are used to seeing. He plans to visit the surgery before each clinic to check the patients' medical record for any recent additions.	Campus Pharmacy, Stirling University    Jonathan Burton	PJ 13 Aug 05

<b>Therapeutic Area</b>	<b>People Involved</b>	<b>Objectives/Service</b>	<b>Contact</b>	<b>Source</b>
Asthma	Twenty community pharmacies in East Ayrshire LHCC	To establish the contribution that community pharmacy can make to improve the lives of asthma patients and to improve clinical outcomes in non-consulting people with asthma who have uncontrolled symptoms. Twenty pharmacies in East Ayrshire will participate in the project. People with uncontrolled asthma will be identified in the pharmacy using a questionnaire and referred back to their local asthma clinic for review and follow up eight weeks later.		Asthma UK project  Sept 05-Mar 06
Asthma	Community pharmacists in two rural community pharmacies in Draperstown, Northern Ireland	Community pharmacists provide an asthma review service incorporating medicines management. Community pharmacists were involved in assisting GPs in collating information on patients (aged 16-40 years) they currently have difficulty encouraging to attend Asthma Clinics. This service helped increase public access to a Primary Health Care Professional in treating asthma whilst raising awareness within the population of the range of knowledge and skills the pharmacist can provide in the management of chronic disease.  October 2004 – March 2005 Full report available  from <a href="http://www.mulhscg.n-i.nhs.uk">www.mulhscg.n-i.nhs.uk</a>	Project Manager: Sharon Diamond	
COPD	44 Tesco pharmacies	COPD medicines use review service provided in 44 Tesco stores in conjunction with GSK. Consultation with the pharmacist covering inhaler technique, smoking cessation advice (if required) & annual flu vaccination discussion.]	Carol Clarkin  <a href="mailto:carol.clarkin@uk.tesco.com">carol.clarkin@uk.tesco.com</a>	
Diabetes	Pharmacist in GP surgery in Darlington	Pilot of a pharmacist run diabetes management service. Aim to detect, prevent and solve drug-related problems in people with diabetes. GP's at surgery refer patients to pharmacist who will give advice on treatment adjustments, meal planning and exercise.		.

Therapeutic Area	People Involved	Objectives/Service	Contact	Source
Diabetes	Community pharmacists in Hillingdon PCT	<p>Pharmacist-run diabetes programme developed with Pharmacy Alliance. Pt attends sessions at their local pharmacy to have their blood glucose, BP, cholesterol levels and BMI measured. Pharmacist provides advice or refers pt to GP as necessary.</p> <p>Shown to improve patients' perceptions of their condition and medicines</p>		
Diabetes	Six pharmacies in Durham Dales PCT	Pharmacy-based screening service offered to 6 pharmacies, which will identify and support at risk pt's. Developed with Pharmacy Alliance, neighbourhood renewal unit and Durham PCT. Pharmacist will brief pt GP, referring those with cause for concern for diagnostic testing.		
Diabetes / Chronic respiratory disease	Community pharmacies in Sunderland	Pharmacists interview long term respiratory and diabetic patients at intervals to monitor symptom control, check and encourage compliance and check and correct device technique. Report findings to GP or relevant nurse.		PSNC database

Therapeutic Area	People Involved	Objectives/Service	Contact	Source
Diabetes	Midulster Pharmacy Locality Group: Ten community pharmacies in the Cookstown, Magherafelt and Portglenone areas in Northern Ireland	<p>The provision of additional health screening services in a different healthcare setting. Early detection and referral of those identified as being at risk of Type 2 diabetes to their GP. Better management of the Type 2 diabetes in those diagnosed early and mitigation of long-term risks through early diagnosis. Improved understanding of the roles played by members of the extended diabetes care team.</p> <p>October 2003 – March 2005 Full report available from <a href="http://www.mulhscg.n-i.nhs.uk">www.mulhscg.n-i.nhs.uk</a></p> <p>A draft report is available for the Eastern Health Board project.</p>	<p>Project manager: Anne-Marie Groom</p> <p>A similar project was also run by:</p> <p>Community pharmacies in the Eastern Health and Social Services Board, Northern Ireland</p> <p><i>Project manager: Dr Martin Kerr, Community Pharmacy Adviser, EHSSB, Champion House, Belfast.</i></p>	
CHD	Community pharmacist in Forth Valley	Running supplementary prescribing clinics for CHD patients on complex medication regimens. Patients referred by surgery in GP's surgery moving to pharmacy once extended. Patients treated according to clinical management plan. Pharmacist will measure BP recommend any blood tests needed and adjust medicines as appropriate. Pt's signed off once reach therapeutic goals.	Campbell Shimmins  Doune Pharmacy	

<b>Therapeutic Area</b>	<b>People Involved</b>	<b>Objectives/Service</b>	<b>Contact</b>	<b>Source</b>
CHD	Clinical Pharmacist, Monkfield Practice,  Cambridgeshire	Management of CHD and hypertension, with supplementary prescribing.	Sandra Prater	
CHD	Hospital pharmacists	Hospital pharmacists run medication review clinic in GP practice. One session per week in which CHD patients' medicines are reviewed. Three hospital pharmacists involved. Funded by practice from its PMS budget. Follows a collaboration to run a primary care anticoagulant service.	Duncan McRobbie	PJ July 10 04
CHD / Weight management	Community pharmacies  Essex	Coronary Heart Disease Risk assessment using computer model to demonstrate actual risk reduction if a particular risk factor was addressed. Measurement and explanation of BMI. Blood pressure measurement, Blood glucose measurement, Total cholesterol measurement		PSNC database
CHD  Weight management	Community pharmacists in East Riding and Hull LPC	Weight management support service from community pharmacies in collaboration with GP surgeries targeting BMI, BP, cholesterol and waist circumference, and the potential of introducing a PGD for orlistat.		PSNC development awards 2004
CHD risk factor assessment	Community pharmacies  Dorset	Lifestyle assessment via touchscreen in the pharmacy including age and gender profile, diet, smoking, and exercise. The programme calculates BMI. Risk is calculated between 0 and 100. Those at medium risk or higher are offered a fingerpad blood test and lipid profiling. A direct correlation has been found between overweight or obesity and medium to high risk of CHD. Patients who take a blood test and undergo lipid profiling are then given a more detailed risk profile for CHD and stroke. If necessary patients are referred to the GP, but there is no evidence of increased workload for GPs.	Roger King	

Therapeutic Area	People Involved	Objectives/Service	Contact	Source
CHD Stop Smoking	Community pharmacies, Harrow	PCT-wide Stop Smoking service provided by 50 pharmacies. 763 of 1454 people had stopped smoking at 4 weeks in 2003-4. 139 did not stop and 552 were lost to follow up. Community pharmacist-led outreach clinics were run for staff in the local hospital, also at the local mosque, bus garage, council offices and at the refuse depot related to the council.		
CHD	133 community pharmacies	Initial 3-month trial to calculate coronary heart disease risk using total cholesterol, HDL, BP and other risk factors. 133 pharmacies participated. 6,007 patients were assessed, 572 GP referrals were made, including 234 patients identified as having serious risk of CHD.	Elaine Hartley  Senior Manager Professional Services  <a href="mailto:elaine.hartley@alliancepharmacy.co.uk">elaine.hartley@alliancepharmacy.co.uk</a>	Alliance Pharmacy, to be published in the near future.
Hypertension	Community pharmacy, Coatbridge	Running BP management clinic one session per week in the pharmacy for patients whose BP is stable. Clinical management plans are drawn up and agreed with GP. Patients identified from repeat medication slips. Plans to borrow patients' notes from the surgery on the morning of the clinic and, after seeing the patient and annotating the record, return the notes to the surgery in the evening.	Marie Therese Rogers  Coatbridge	PJ Aug 15 05
Hypertension	Community pharmacist in Rowley, Regis and Tipton area	Supplementary prescribing for 60 patients with hypertension. Running 4 clinics, one jointly with nurse.	Richard Thompson  Rowley Regis & Tipton PCT  Richard.thompson3@nhs.net	

Therapeutic Area	People Involved	Objectives/Service	Contact	Source
Hypertension	Practice pharmacist, Durham	Audit comparing pharmacist-managed hypertension vs usual care in two practices. (completed)	Sarah Tulip	
Heart Failure	Community pharmacists in Glasgow	<p>Patients referred to the community pharmacy of their choice by prescribing support pharmacists, hospital pharmacist or heart failure liaison nurses. Objective is to make interventions that increase adherence as well as identify any problems that need to be referred. Community pharmacist will carry out an initial assessment to determine a patient's symptoms and will then monitor progress against this baseline. Patients seen monthly. Symptoms and treatment side effects monitored. Education about medicines provided.</p> <p>Two thirds (190) of the CPs in Glasgow have been trained to provide the service. 150 patients involved at June 05.</p> <p>Community pharmacists are paid for the service.</p>	<p>Richard Lowrie, Lead Clinical Pharmacist, PCT Headquarters, Gartnavel Royal Hospital, 1055 Great Western Road, Glasgow G12 0XH</p> <p>Richard Lowrie@gartnavel. glacomen.scot.nhs.uk</p> <p>0141 211 0265</p>	

Therapeutic Area	People Involved	Objectives/Service	Contact	Source
Hypertension	Community pharmacist, Limavady (completed)	<p>Hypertension clinic. A local GP practice referred the following categories of patients: (a) new patients presenting with hypertension to eliminate the possibility of 'white-coat' hypertension (b) existing patients with erratic blood pressure readings (c) patients who are unconcordant with their medication. The community pharmacist recorded the patient's blood pressure readings for a number of weeks depending on patient's requirements, met with GP to report findings and agreed appropriate remedial action. The community pharmacist also offered the Board-approved medication review service for patients for whom this was deemed appropriate.</p> <p>August to November 2004 Full report available from: <a href="http://www.whssb.org/lhscg/index.html">www.whssb.org/lhscg/index.html</a></p>	<p>Brendan Gormley Community Pharmacist. Limavady</p>	
Hypertension	Community pharmacies	Initial participation in the Blood Pressure Association, "Know your numbers" week in 2003 identified patients with risk factors with uncontrolled BP. Some Alliance Pharmacy branches are still continuing to offer BP testing	<p>Elaine Hartley Senior Manager Professional Services  elaine.hartley@alliancepharmacy.co.uk</p>	Int J Pharm Pract 2004;12(suppl):R69
Hypertension	Four community pharmacies	A project aimed at improving blood pressure control in people with diabetes who have uncontrolled hypertension, through self-monitoring of blood pressure and self-regulation of medication. Patients involved in the study receive support in self-monitoring and self-adjustment of medication from 4 specially trained community pharmacists, who are also doing the supplementary prescribers course.	<p>Caroline Kelham  ckelham@medicines-partnership.org</p>	

Therapeutic Area	People Involved	Objectives/Service	Contact	Source
Anticoagulation	Community pharmacy in South West Sheffield PCT	<p>In April 2004 completed a pilot to evaluate a Primary Care based INR management service and, following a successful evaluation and positive patient feedback, is working with Sheffield SW PCT to extend this to a full service under the new General Medical Services contract.</p> <p>Community pharmacy based anticoagulant clinic.</p> <p>Managing 25 warfarin patients attached to three GP practices (Jan 05) and aimed to take over the care of a further 25 patients. The clinic is run on a set morning each week when the pharmacy is staffed by two trained anticoagulation pharmacists. Written dosing information is communicated to the GP as well as the patient.</p>	<p>Andrew Hartley, South West Sheffield PCT</p> <p>Brigitte Waring, Anticoagulation lead pharmacist; Tina Cooke; Steve Morris</p>	
Anticoagulation	Community pharmacy in Charnwood & NW Leicester LPC & PCT.	<p>Near patient testing to relieve pressure on hospital INR tests. Pharmacists conduct INR test, counsel patients and adjust Warfarin dose. Between 20 and 40 patients are seen in a ½ day clinic.</p>	<p>Elaine Hartley</p> <p>Senior Manager Professional Services</p> <p><a href="mailto:elaine.hartley@alliancepharmacy.co.uk">elaine.hartley@alliancepharmacy.co.uk</a></p>	
Anticoagulation	A community pharmacy in Bradford North PCT	<p>Community pharmacist providing monitoring and dose adjustments for patients stabilised on warfarin. The service is provided in a GP surgery. The clinic was established in 1997 and currently sees between 20 – 30 patients every fortnight. 2 pharmacists provide cover for holidays etc.</p> <p>Set up in conjunction with Bradford NHS Trust and the Bradford North PCT</p>	<p>Elaine Hartley</p> <p>Senior Manager Professional Services</p> <p><a href="mailto:elaine.hartley@alliancepharmacy.co.uk">elaine.hartley@alliancepharmacy.co.uk</a></p>	

Therapeutic Area	People Involved	Objectives/Service	Contact	Source
Anticoagulation	A community pharmacy in Sunderland TPCT	Community pharmacy based outreach anticoagulant clinic, contracted to Sunderland TPCT. Trained and accredited staff run one half-day clinic session per week and manage 137 patients, previously stabilised on warfarin. Computerised decision support software is used to support warfarin dose adjustment through agreed protocols.	Nicola Roe Rowlands Pharmacy <a href="mailto:nroe@rowlandsparmacy.co.uk">nroe@rowlandsparmacy.co.uk</a>	
Anticoagulation	Community pharmacy Derwentside PCT	Community pharmacy based anticoagulation service. (Awaiting more details)	Andy Reay <a href="mailto:andy.reay@derwentsidepct.nhs.uk">andy.reay@derwentsidepct.nhs.uk</a> and Noel Dixon <a href="mailto:noel@dixonandhall.co.uk">noel@dixonandhall.co.uk</a>	
Point of Care Testing	22 Community pharmacies in Greater Manchester SHA	22 pharmacies measuring HbA1c, total cholesterol/HDL/triglycerides/LDL, blood pressure, weight, height, waist circumference for patients with diabetes and CHD. Medication, lifestyle, diet and physical activity. Intention to develop INR testing service.		
Polypharmacy	A practice pharmacist in Lancashire	Supplementary prescribing for patients with polypharmacy. Special interests COPD and heart failure – 30 patients.  Currently investigating repeat attendance at A & E. Also sees patients with minor illness.	Sean Mackey Pharmacist Practitioner & full time practice partner, Mountview Practice, Fleetwood <a href="mailto:Sean.Mackey@gp-p81089.nhs.uk">Sean.Mackey@gp-p81089.nhs.uk</a>	

Polypharmacy		Care home medicine reviews, working with chronic disease management team.	Alison Wilson, Head of Medicines Management, West Hull PCT  01482 303518  <a href="mailto:Alison.Wilson@whpct.nhs.uk">Alison.Wilson@whpct.nhs.uk</a>	
Polypharmacy	Primary care pharmacist (specialising in post discharge review) in Northants.	Intermediate care – post-discharge medication review	Marianne Price,  Post-discharge medication review pharmacist, Northants Heartlands PCT, Nene House, Isebrook Hospital, Irthlingborough Road, Wellingborough NN8 1LP  01536 494452  <a href="mailto:Marianne.Price@northantsheartlandspect.nhs.uk">Marianne.Price@northantsheartlandspect.nhs.uk</a>	

Therapeutic Area	People Involved	Objectives/Service	Contact	Source
Polypharmacy	Community pharmacies in South East Belfast	To identify and target vulnerable older people aged 50 and over within the South and East Belfast and Castlereagh area using a set of agreed criteria via referrals from a variety of health and social care professionals. The service involves specially trained community pharmacists in the provision of initially two individual medication reviews three months apart, with the possible provision of additional reviews as required. As part of the scheme, referred patients are provided, if necessary, with disposable monitoring dosage systems by the community pharmacists after assessment.	Project Manager: Yvonne Wong, Pharmacist, South and East Belfast Trust.  Telephone: (028) 9056 5632  Email: <a href="mailto:Yvonne.wong@sebt.n-i.nhs.uk">Yvonne.wong@sebt.n-i.nhs.uk</a>	
Polypharmacy: Medicines Management	Community pharmacies across Northern Ireland	Medication Review Service for 'at-risk' patients being run through some community pharmacies in Northern Ireland, administered by the four Board areas and funded by the Department of Health, Social Services and Public Safety in Northern Ireland.  This service: educates patients about all aspects of their medicines both prescription and OTC and their medical condition; helps patient compliance to their medicines; promotes liaison with other members of the primary healthcare team.	Dr Denis Morrison, Northern Health and Social Services Board, County Hall, 182 Galgorm Road, Ballymena.  <a href="mailto:Denis.Morrison@nhssb.n-i.nhs.uk">Denis.Morrison@nhssb.n-i.nhs.uk</a>	

Therapeutic Area	People Involved	Objectives/Service	Contact	Source
Polypharmacy	Domiciliary pharmacists	<p>The service is aimed at clients who have issues with medicines and would benefit from a medicines management assessment, in particular those who may need help remembering to take medicines and may be suitable for a Medicine Reminder Service. It is targeted particularly at older and vulnerable people and those who are already receiving social services or domiciliary support in medicine taking that could be managed more efficiently.</p> <p>Referral is tied into the single assessment process and can be made by professionals from across health, social services and housing. Domiciliary Pharmacists will then visit clients to assess their understanding and discuss ways of managing medicines to enable greater independence. If normal methods e.g. review, education, written prompts, compliance aids are not sufficient and the client is judged suitable, an electronic prompting device can be installed., connected to existing call centre support run by the client's housing provider.</p>	<p>Caroline Kelham</p> <p><a href="mailto:ckelham@medicines-partnership.org">ckelham@medicines-partnership.org</a></p>	
Medicine Support Service	Community pharmacies in East Riding and Hull	<p>Assessing the need for medicine support service that includes the use of a Single Assessment Process that encompass DDA, MUR and MDS requirements</p> <p>East Riding and Hull PDG, ERLPC and Eastern Hull , West Hull. East Yorkshire and Yorkshire Wolds and coast PCT in 1999</p>	<p>Elaine Hartley</p> <p>Senior Manager Professional Services</p> <p><a href="mailto:elaine.hartley@alliancepharmacy.co.uk">elaine.hartley@alliancepharmacy.co.uk</a></p>	

Therapeutic Area	People Involved	Objectives/Service	Contact	Source
Medicine Support Service		Assessors & suppliers. The scheme allows the assessor to recommend, where appropriate, that the patient be given either a compliance aid or help from social services. Monitored dosage systems (MDS) will be supplied by community pharmacists on a weekly basis..	Elaine Hartley  Senior Manager Professional Services  <a href="mailto:elaine.hartley@alliancepharmacy.co.uk">elaine.hartley@alliancepharmacy.co.uk</a>	PCT  See PJ article 16.8.2003  Vol 271 No 7262 p196
Medicine Support Service	Community pharmacies in Brighton and Hove PCT	LPS contract to provide a medicine management service for frail, elderly and vulnerable people. The service is provided in the community and in hospital. Its objective is reduce readmission to hospital, facilitate discharge and to improve therapeutic outcome.	Elaine Hartley  Senior Manager Professional Services  <a href="mailto:elaine.hartley@alliancepharmacy.co.uk">elaine.hartley@alliancepharmacy.co.uk</a>	
Evaluation of a pharmacist led intervention to improve adherence with medication.		Randomised control using patients on a prescription for a newly prescribed medication with a stroke, asthma, diabetes, rheumatoid arthritis or 75 years plus. Telephone intervention and postal questionnaire. Non-adherence in the intervention group was 9% and in the control group was 16%. 23% of the patients had medication related problems in the intervention group against 34% in the control group.  Also involved Professor Nick Barber, Dr Sarah Clifford School of Pharmacy London University. Dr Rob Horne Brighton University. Dr Rachael Elliott Manchester University	Elaine Hartley  Senior Manager Professional Services  <a href="mailto:elaine.hartley@alliancepharmacy.co.uk">elaine.hartley@alliancepharmacy.co.uk</a>	

Therapeutic Area	People Involved	Objectives/Service	Contact	Source
Pharmacist support for CDM	Primary care pharmacist	New post – main remit to support CDM team. Priorities heart failure and diabetes. Level 2 – Care management.	Anees Al-Mushadani Prescribing Adviser, Chronic Disease Management, Camden PCT 3 <sup>rd</sup> Floor, Bedford House, 125-133 Camden High Street, London NW1 7JR 020 7865 5823 <a href="mailto:Anees.al-mushadani@camdenpct.nhs.uk">Anees.al-mushadani@camdenpct.nhs.uk</a>	

Therapeutic Area	People Involved	Objectives/Service	Contact	Source
Cystic Fibrosis	Lloydspharmacy	<p>Key features were:</p> <p>a. Dispensing and home delivery of all outpatient and community prescribed medicines</p> <p>b. Home medication review with community pharmacists who had access to secondary care medical and prescribing information</p> <p>Outcomes were independently assessed by the University of Birmingham:</p> <ul style="list-style-type: none"> <li>- Does the new service increase the quality of life (QoL) of adult CF patients?</li> <li>- How does the new service impact on patient satisfaction?</li> <li>- What are the cost implications to the NHS of such a service?</li> <li>- What impact does the community pharmacy led medication review have in terms of interventions and treatment optimisation?</li> </ul> <p>Conducted in collaboration with West Midlands Adult Cystic Fibrosis Centre and Pharmacy Directorate at the Heart of England NHS Foundation Trust, Birmingham.and</p> <p>University of Birmingham Health Services Management Centre</p>	<p>Alison Jones</p> <p><a href="mailto:Alison.Jones@lloydspharmacy.co.uk">Alison.Jones@lloydspharmacy.co.uk</a></p>	

Therapeutic Area	People Involved	Objectives/Service	Contact	Source
Indigestion and Heartburn	Antrim and Ballymena Pharmacy Locality Group, Northern Ireland: Helicobacter pylori breath testing scheme	<p>The breath test provides non-invasive diagnostic testing of a bacterium called helicobacter pylori, which may be present in certain patients who have persistent symptoms of indigestion and heartburn. The breath test is recognised as the "gold standard" test for the detection of H-pylori and confirmation of eradication by the British Society of Gastroenterologists. Under the scheme patients are referred by their GP to a suitably trained pharmacist where the test is carried out according to a written protocol. This is less distressing than taking a blood sample from the patient and, furthermore, with the breath test, results are obtained more quickly. The breath test is an effective and more accurate test, which takes approximately 30minutes to complete. Once completed the pharmacist mail the test to the manufacturer for analysis with the patient's GP receiving the results by fax within 24 hours of receipt.</p> <p>Full report available from: Mervyn Kennedy, Manager, Antrim and Ballymena LHSCG Email: <a href="mailto:ablhscg@nhssb.n-i.nhs.uk">ablhscg@nhssb.n-i.nhs.uk</a></p>	Project Manager: Dr Andrea Linton, Antrim and Ballymena Locality Prescribing Advisor	
Community Development*	Building the Community Pharmacy Partnership scheme	<p>Using a community development approach, community pharmacists have been encouraged to engage with their local communities to deliver locally responsive services thereby harnessing local leadership and expertise to deliver local solutions to local problems. This highly innovative public health initiative tackles chronic diseases such as: mental health, coronary heart disease, asthma, diabetes, and medicines management issues. These services are delivered in a variety of settings using a variety of health promotion approaches including: lay health workers, health information sessions, outreach activities. 88 projects have been funded since October 2001 covering 21 different themes.</p>	For more information: <a href="http://www.cdhn.org/bcpp/projects">www.cdhn.org/bcpp/projects</a>	

Therapeutic Area	People Involved	Objectives/Service	Contact	Source
Parkinsons Disease	Community pharmacies in Coventry St Helen's , Brighton and Hove City and Coventry PCTs	<p>Medicines Partnership Community Pharmacy Parkinson's Disease Project</p> <p>The project has trained up 5-6 Community pharmacists within each of three participating PCTs. These pharmacists are then offering regular, structured consultations with PD patients and/or their carers over a 6 month period in which they will:</p> <ul style="list-style-type: none"> <li>• Elicit and document patient views and experiences of their medicines</li> <li>• Identify and address patient issues &amp; concerns regarding their medicines and condition</li> <li>• Provide support &amp; counseling on: <ul style="list-style-type: none"> <li>– How their medicines work</li> <li>– Side effects</li> <li>– Interactions</li> <li>– Dietary advice</li> <li>– Practical aids to medicine taking</li> <li>– Optimal dosage timing</li> <li>– Offer written information if appropriate</li> </ul> </li> </ul>	<p>Caroline Kelham</p> <p><a href="mailto:ckelham@medicines-partnership.org">ckelham@medicines-partnership.org</a></p>	

		<ul style="list-style-type: none"><li>• Recommend other useful sources of information &amp; help (e.g. patient groups)</li><li>• Refer patients to GP where appropriate (if unable to address problems in Pharmacy)</li><li>• Provide feedback to GP/specialist, including recommendation for prescription changes, and follow up</li></ul> <p>The project is currently being evaluated and results will be available around Apr 2006</p>		
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Therapeutic Area	People Involved	Objectives/Service	Contact	Source
Osteoporosis	Hospital pharmacist in North West London	<p>The osteoporosis medication management clinics were established in early 2001. The service is run by a pharmacist practitioner with a special interest in osteoporosis and falls prevention. Suitable patients who would benefit from a level 3 medication review are cross-referred to the clinics by the consultant or senior registrar from the menopause and osteoporosis outpatient clinics, with some direct referrals from GPs. A system for cross – referrals to and from the Harrow Falls service has also been established. The pharmacist practitioner with a special interest provides support for osteoporosis services for Harrow Primary Care Trust.</p> <p>The service offers holistic care and includes clinical medication review, menopause care and falls and fracture prevention advice as appropriate. Patients are supported to agree lifestyle, social and self care interventions as part of management.</p>	<p>Nuttan Tanna  <a href="mailto:Nuttan.tanna@nwlh.nhs.uk">Nuttan.tanna@nwlh.nhs.uk</a></p>	

## Appendix 2: Summary of findings: Pharmacists baseline survey

Of the 180 pharmacies indicating that they would like to specialise in something, 32 stated that they were prepared to specialise in anything or did not state any form of preference. Of the pharmacies that had a suggested area of specialisation, easily the most popular was Diabetes, which was the suggestion of 80 of the 180 pharmacies. Other than that, between 20 and 30 pharmacies indicated a desire to specialise in CHD, Blood Pressure Monitoring or Asthma. Between 10 and 15 pharmacies indicated a desire to specialise in smoking cessation services, substance misuse services, MUR, anti-coagulants or Warfarin, minor ailments, cholesterol or weight. Between 4 and 8 pharmacies indicated a desire to specialise in EHC, MDS, respiratory conditions or COPD, skin conditions including eczema, epilepsy, the elderly, or palliative care and chronic disease management.

The comparison of desired speciality to services currently provided is interesting, if inconclusive due to a relatively small sample size and the uncertainties involved in interpreting write-in answers. The strongest and most obvious conclusion is that (using a Chi Squared test at 90%), there is no evidence of any form of correlation between the state of service provision of CHD services and desire to specialise in CHD testing. On the other hand, there is some correlation between diabetes monitoring and support and a desire to specialise – but those who would like to specialise in diabetes services are actually less likely than average to have such facilities, and instead want extra training, funding or facilities so they can be implemented. Significant correlations between other suggested specialities and facilities already provided are harder to find due to a small sample size, but the significant negative correlation between provision of blood pressure services and desire to specialise in blood pressure, and the fact that no one who offers a cholesterol testing service wished to specialise in cholesterol (note that this is not statistically significant due to sample size) would tend to indicate that those who actually provide such services did not answer this question in the affirmative, either because they were already specialising or because they did not wish to specialise beyond providing the service.

### Plans for new services

The most common new services that pharmacies were planning to introduce over the next year were MUR and some form of diabetic testing and support, both with just under 25 pharmacies indicating that this service would be introduced. There were around 15 indications each of intent to introduce cholesterol testing, height/weight/BMI services, Blood pressure monitoring and smoking cessation services (note that there was significant overlap between these categories). Around ten pharmacies indicated that they intend to introduce either EHC or a minor ailments service.

### Appendix 3: Asthma intervention studies

Authors	Outcome type	Intervention	Measure used	Study design	Findings
Mangiapane 2005	Physician assessment  Patient self reports  Health insurance claims data	Patient education (5 sessions over 1 year) covering the disease, use of medicines, inhalation technique and self management.	Lung function  Physician rated asthma severity  Patient knowledge  Patient-reported asthma symptoms  Health-related quality of life	Before-after comparison. Also paper-based review of health insurance claims data for 183 intervention and 550 control patients.  39 community pharmacies  Germany	Lower physician rated asthma severity at 12 months (from 2.0 to 1.7, $p < 0.002$ ). No significant changes in lung function tests.  Significant increases in patient knowledge, self efficacy and self-reported adherence, quality of life and significant improvement in patient-reported asthma symptoms.
Schulz 2001	Lung function  Physician and patient assessment of asthma severity  Patient self reports	9 consultations with the pharmacist over 1 year.	Lung function  Evening peak flow  Physician-rated asthma severity  Patients' self-rated asthma severity  Inhaler technique  Health-related quality of life  Self efficacy  Patient knowledge	Controlled study  48 community pharmacies (26 intervention pharmacies)  Germany  161 intervention patients; 81 control	Significant improvement in evening peak flow; inhaler technique; asthma-related QOL; self efficacy; patient knowledge.  No change in physician-rated asthma severity or dyspnoea. FEV significantly improved at 6 but not 12 months.

Saini 2004	<p>Peak flow</p> <p>Asthma severity</p> <p>Prescribed medicines</p> <p>Cost savings</p> <p>Patient self reports</p>	<p>Four consultations with the pharmacist over 6 months</p>	<p>Asthma severity</p> <p>Peak flow (intervention patients only)</p> <p>Presence of asthma self management plan</p> <p>Medicine profile</p> <p>Annual medicine costs</p>	<p>Controlled study</p> <p>25 community pharmacies</p> <p>Australia</p> <p>52 intervention patients; 50 controls</p>	<p>Significant reduction in asthma severity (p&lt;0.003) in intervention group.</p> <p>Peak flow increased from 82.7% to 87.4% in intervention patients (p&lt;0.001).</p> <p>Significant increase in written self management plans (12% to 58%)</p> <p>Significant change towards 'ideal' medicines profile from 7.7% to 28.8% (p&lt;0.001)</p> <p>Annual cost saving \$133 (Australian)</p>
Mclean 2003	<p>PEFR</p> <p>Emergency room and physician visits</p> <p>Days off work</p> <p>Patient knowledge</p> <p>Health costs</p>	<p>Three groups: controls, usual care (UC) and enhanced care (EC). Usual care was a single consultation with the pharmacist where patient asthma symptoms, medicines use and knowledge were assessed and inhaler technique was checked. EC additionally involved teaching of asthma self management following assessment of 'readiness to change'. EC involved three consultations at 2-3 week intervals with 3-monthly follow up over 1 year.</p>	<p>Asthma symptom score</p> <p>PEFR</p> <p>Number of days off work/education</p> <p>Number of emergency room visits</p> <p>Number of physician visits</p> <p>QOL</p> <p>Patient knowledge</p>	<p>RCT</p> <p>Randomised at pharmacy level</p> <p>33 community pharmacists</p> <p>Canada</p>	<p>Compared with the 'usual care' group intervention group symptom scores reduced by 50%; PEFR increased by 11%; days of work/education reduced by 0.6 days/month; use of inhaled beta agonists decreased by 50%; emergency room visits decreased by 75%; physician visits decreased by 75%; patient knowledge score doubled; QOL scores increased by 19%</p> <p>Health care costs were 57% lower, mainly from reduced hospital and physician usage. Medicines costs increased by 10% mainly due to increased inhaled steroid use.</p>
Emmertson 2003	<p>Composite asthma score</p> <p>Quality of life</p>	<p>Consultation with the pharmacist approximately monthly for 1 year.</p>	<p>Composite asthma score</p> <p>Presence or changes to asthma management plan</p>	<p>Before and after comparison</p> <p>5 community pharmacies, mainly</p>	<p>Mean of 4.3 medicines-related problems. Two thirds were compliance-related.</p> <p>Nearly three quarters had a new or</p>

			Bronchodilator use  Quality of life	rural  New Zealand  100 patients	revised asthma plan.  50 had an improved composite asthma score; 27 had a worse score  49 were referred to another professional  44 patients reduced bronchodilator use; 26 increased it  Some positive QOL changes
Barbanel 2003	Asthma symptoms	Pharmacist reviewed inhaler technique and self management advice at initial consultation.  Pharmacist followed up patients weekly by phone for 3 months.	North of England asthma symptoms scale	RCT  UK  One community pharmacy  24 patients	Improvement in symptoms in all except one in intervention group. Change in symptom scores was significant (p<0.001). Slight worsening in controls.
Weinberger 2002	Peak flow  Hospital usage  Quality of life	Pharmacists provided pharmaceutical care.	<i>Primary outcomes</i>  PEFR  QOL  Compliance  Breathing-related emergency department or hospital visits  <i>Secondary outcomes</i>  Patient satisfaction with care	RCT with 3 arms (pharmaceutical care; peak flow monitoring; usual care)  36 drugstores  US  1113 patients	Intervention patients had significantly higher PEFr than usual care but not than PEFr monitoring group.  No differences in compliance and QOL.  Intervention patients had more breathing-related emergency department visits than usual care but not more than PEFr patients.  Intervention patients more satisfied than patients in PEFr or usual care.

Narhi 2001	Patient knowledge and attitudes towards asthma	Minimum of 4 and maximum of 8 consultations with the pharmacist over 1 year.	Patient knowledge of asthma and of medicines  Patient attitudes towards asthma and its management	Open study  Finland  28 patients	Significant improvement in patient knowledge ( $p < 0.003$ ) sustained at 1 year post-intervention
Herborg 2001	PEFR  Inhaler technique  GP usage  QOL  Patient knowledge  Patient satisfaction	Monthly consultation with the pharmacist. Pharmacist measured inhaler technique, PEFR and asthma symptoms.	PEFR  Errors in inhaler technique  Health-related quality of life  Number of GP visits  Knowledge of asthma and medicines  Satisfaction with pharmacy care	Controlled study  264 intervention patients, 236 controls	Significant improvement in asthma symptoms ( $p < 0.024$ ); inhaler technique ( $p < 0.0001$ ); patient knowledge ( $p < 0.031$ ).  Intervention patients made more visits to the GP (mean +1.4) over the 12 months, mainly during the early months.  Intervention patients reported 40% fewer sick days than controls.  Significant improvement in quality of life scores.  No difference in patient satisfaction scores.
Cordina 2001	PEFR  Inhaler technique  QOL	Patient education and monitoring.	PEFR  Inhaler technique score  Self-reported compliance  Physician visits  Days off work  QOL	22 community pharmacies  Malta + Northern Ireland  86 intervention patients, 66 control	No significant difference in PEFR scores.  Difference in inhaler scores between 12 months and baseline was higher in intervention patients ( $p < 0.021$ )  Fewer asthma symptoms reported by intervention patients at 12 months ( $p = 0.051$ )  Significantly improved 'vitality' but not

					<p>other QOL in intervention group.</p> <p>No differences in self-reported compliance; physician visits; days lost from work.</p> <p>8 hospital admissions in control group patients, none in intervention patients.</p>
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## Appendix 4: Hyperlipidaemia intervention studies

Authors	Outcome type	Intervention	Measure used	Study design	Findings
Tsuyuki et al 2002 (SCRIP)	Cholesterol level plus medication changes	<p>Patients received education and a brochure on risk factors, cholesterol testing.</p> <p>Follow up was 16 weeks. Pharmacists faxed recommendations to the patient's doctor.</p> <p>Usual care patients received brochure only and general advice.</p>	Composite of fasting cholesterol or additional or change in lipid lowering medication	<p>Multi-centre RCT</p> <p>54 community pharmacies. Canada.</p>	<p>Primary end point reached in 57% (344) intervention and 31% (control) patients. Study terminated early due to striking evidence of benefit.</p> <p>Efficacy of the intervention was highest in patients with diabetes.</p>
Tsuyuki et al 2004 (Scrip PLUS)	LDL level	<p>Pharmacists measured patients' lipids at baseline, assessed cardiovascular risk and identified lifestyle changes needed. Patients were followed up by phone at 2 and 4 weeks, and were seen at the pharmacy at 3 and 6 months.</p> <p>Participants were patients at 'very high risk' of cardiovascular events.</p>	<p>Change in LDL cholesterol.</p> <p>Secondary outcomes were the proportion of patients reaching target LDL levels, and the proportion of patients who started lipid lowering treatment, had dose changes, and adherence.</p>	<p>Before-After</p> <p>42 community pharmacies. Canada.</p>	<p>Mean LDL cholesterol in 419 patients at baseline was 3.5mmol/L. Mean change at 6 months was a reduction of 0.5mmol/L, relative reduction 13.4%.</p> <p>At 6 months 27% of patients met the LDL target.</p>
Peterson 2004	Total cholesterol level	Patients discharged from hospital following a cardiovascular event received monthly home visits from a pharmacist. Education on risk factors and lifestyle changes was provided, and medication reviewed.	Change in total cholesterol levels.	<p>RCT</p> <p>Australia</p>	Median total cholesterol reduction 0.7 mmol/L in intervention group (n=39), double the reduction in the controls (n=42). 44% of patients in the intervention group and 24% in the control group reached target cholesterol level of 4mmol/L.
Paulos	Total cholesterol	Pharmaceutical care plan. 16 week follow-up with 5 consultations with the pharmacist. Consultations focused on	Change in total cholesterol levels.	RCT	Total cholesterol decreased in 73% of intervention and 33% in controls.

2005		identifying and resolving drug-related problems (DRPs).	Change in BMI.	Chile  One community pharmacy	Decrease in BMI in intervention but not control group.  Resolution of DRPs was 92% in the intervention and 19% in controls.
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## Appendix 5: Diabetes intervention studies

Authors	Outcome type	Intervention	Measure used	Study design	Findings
Cranor et al 2003	Diabetes control	Pharmacist consultations including clinical assessment, goal setting and monitoring, including review of BG results. Collaborative drug therapy management with patient's physician. Pharmacists could refer patients to a diabetes education centre where needed. Pharmacists completed a diabetes certificate programme sponsored by the school of pharmacy.	HbA1c	Quasi-experimental longitudinal study. Interventions provided by 12 community pharmacists. 187 patients.	60% of intervention patients defined as 'controlled' compared with 40% of control
Bliss et al	Diabetes control	HbA1c testing was conducted at the pharmacies and the pharmacist gave feedback to the patient. Pharmacists identified patients with levels above 8% and case discussions were co-ordinated by diabetes nurse specialist involving the pharmacist. Where needed patients were referred to nurse-led diabetes group education sessions.	HbA1c	Open study with 260 patients at five community pharmacies.	Mean level 8.0% at 1 <sup>st</sup> visit and 7.7% at 3 <sup>rd</sup> (NS)
Berringer	Diabetes control	Pharmacist conducted a chart review to identify medication problems.  Pharmacists (2) were Certified Diabetes Educators and they provided training for 8 other participating pharmacists in the 2 pharmacies. Patients completed a 'diabetes checklist' at each visit which focused on symptoms and diabetes control and were also asked to bring their BG results. The	Blood glucose	Open study in two pharmacies with 82 patients.	Reduction from 178.6 to 159.3 (NS)

		pharmacist discussed findings in a consultation with the patient and provided education as needed. Patients who did not bring BG results were then followed up by telephone.			
Krass et al	Adherence	Pharmacist consultations (9) over 9 months with 'Discretionary Adherence Interventions' including discussions of patients' health beliefs, lifestyle, adverse effects of treatment and rationalizing therapy.	Medication record review + Brief Medication questionnaire	Matched parallel group study involving 23 community pharmacies in three clusters with randomization at pharmacy level. 87 intervention and 67 control patients.	Intervention group scores improved significantly compared with controls ( $p < 0.01$ ) after 9 months
Grant	Adherence	Telephone consultations using a structured questionnaire covering adherence to medicines, diet and exercise.	Self-report questionnaire	RCT involving one community pharmacist and 120 patients.	No difference between intervention and control groups
Rajaei-Dekhordi	Medication problems	Pharmacist consultation based on patients' responses to two questionnaires to identify medication problems and patients' concerns. Referral to nurse-led diabetes education session where needed.	Beliefs about Medicines Questionnaire + Satisfaction with Information about Medicines score	Open study in four community pharmacies with 83 patients.	3.2 problems per subject at baseline; improvement in patient satisfaction with information; reduction in patients' concerns / misbeliefs about medicines
Pharmacy Alliance	Diabetes control	As above	Satisfaction with information about medicines  HbA1c  BP  Random blood glucose	Pre-post design. 181 patients (37 with six month follow up) with 13 UK community pharmacists and 6 pharmacy assistants.  Mean consultation time 49 mins.	Improvement in patients' satisfaction with information about medicines.  15/33 pts with initial HbA1c > 7.5% reached target level  19/53 pts with BP above 140/85 reached target  12/23 reached total

			BMI		cholesterol target of 5  Trend to decreased BMI
Swain	Patient knowledge	2 or 3 education sessions tailored to patient needs. Mean duration one hour (range 45-75 minutes).	Patient knowledge.	Open study with 34 patients.	Significant improvement in Type 2 diabetes patients but not Type 1
West	Diabetes control	One to one initial assessment followed by group education sessions (8) provided in a pharmacy by pharmacist, nurse and dietitian.	HbA1c  Random blood glucose  BMI	Pre-post design with one community pharmacist and 30 patients (6 Type 1, 24 Type 2)	Significant reduction in HbA1c and blood glucose.  No significant change in BMI
Hogue	Diabetes control	Diabetes education programme	HbA1c  Fasting BG  Total cholesterol, HDL, LDL  BP  Diabetes knowledge  QOL	Pre-post design with 381 patients at three community pharmacies in three US cities.	Significant improvements in all parameters except LDL and QOL
Wermeille	Pharmaceutical Care Issues (PCIs)	Initial assessment by pharmacist, preparation of pharmaceutical care plan then agreed with the patient's GP.	Numbers and types of PCIs  HbA1c and BP  Total cholesterol  Patient knowledge	Pre-post design with 62 patients with Type 2 diabetes in four UK community pharmacies. Follow up at 6 months.	Significant improvement in HbA1c, BP, TC and patient knowledge.  74/76 drug therapy PCIs agreed by GP and resolved in 55.

## Appendix 6: Summary of outcomes: diabetes studies

	HbA1C	Blood Glucose	BP	Total cholesterol	BMI	Other
<b>Cranor 2003</b>	60% intervention vs 40% controls reached target level					
<b>Bliss</b>	Baseline mean level 8%, end of study 7.7% (NS)					
<b>Berringer</b>		Baseline 178.6 to 159.3 end of study (NS)				
<b>Krass</b>						Adherence significantly improved
<b>Grant</b>						Adherence NS
<b>Pharmacy Alliance</b>	15/33 pts over 7.5% at baseline reached target		19/53 pts over 140/85 at baseline reached target	12/23 reached TC target of 5	Trend to reduction NS	
<b>Swain</b>						Patient knowledge  Significant improvement in Type 2 but not Type 1
<b>West</b>	Significant reduction					NS
<b>Hogue</b>	Significant reduction	Significant reduction	Significant reduction	Significant reduction in TC but not LDL		
<b>Wermeille</b>	Significant reduction		Significant reduction	Significant reduction		