Clinical pharmacists in general practice: An initial evaluation of activity in one English primary care organisation

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All authors were involved in the design of the study and data collection, and all authors had access to the data set. JB and CAL analysed and interpreted the data. JB was responsible for preparation of the first draft of the manuscript and all authors revised it critically and approved the submitted version.

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Conflict of interest statement

JB and CL have no conflicts of interest to disclose.

DJ is employed by Dudley CCG.

JJ offers consultancy services to Dudley CCG.

CH is employed by Dudley CGG.

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ABSTRACT

Objectives

This aim of this research was to characterise the breadth and volume of activity conducted by clinical pharmacists in general practice in Dudley Clinical Commissioning Group (CCG), and to provide quantitative estimates of both the savings in general practitioner (GP) time and the financial savings attributable to such activity.

Methods

This descriptive observational study retrospectively analysed quantitative data collected by Dudley CCG concerning the activity of clinical pharmacists in GP practices during 2015.

Key findings

Over the nine month period for which data were available, the 5.4 whole time equivalent clinical pharmacists operating in GP practices within Dudley CCG identified 23,172 interventions. Ninety five per cent of the interventions identified were completed within the study period saving the CCG in excess of £1,000,000.

During the four months for which resource allocation data were available, the clinical pharmacists saved 628 GP appointments plus an additional 647 hours that GPs currently devote to medication review and the management of repeat prescribing.

Conclusions

This research suggests that clinical pharmacists in general practice in Dudley CCG are able to deliver clinical interventions efficiently and in high volume. In doing so, clinical pharmacists were able to generate considerable financial returns on investment. Further work is recommended to examine the effectiveness and cost-effectiveness of clinical pharmacists in general practice in improving outcomes for patients.

Keywords: clinical pharmacists, English National Health Service, general practice, general practitioners, primary care

INTRODUCTION

In July 2015, National Health Service (NHS) England announced the launch of the 'Clinical Pharmacists in General Practice Pilot' – a £15 million, three year initiative to fund, recruit and employ clinical pharmacists in General Practitioner (GP) surgeries.(1) The pilot intended to build upon the experiences of the limited number of GP surgeries, including surgeries within Dudley Clinical Commissioning Group (CCG), that already had clinical pharmacists in patient facing roles. The NHS England pilot would see pharmacists employed directly by GP surgeries to assist patients whilst easing GP workload and improving communication between general practice, hospitals and community pharmacists. In October 2015, the budget for the pilot was increased to £31 million with NHS England claiming that this would "*part-fund 403 new clinical pharmacist posts across 73 sites, covering 698 practices in England, supporting over 7 million patients*".(2,3) No surgeries within Dudley CCG were selected to be pilot sites.(4)

Whilst interest in employing pharmacists in GP surgeries has increased markedly since the announcement of the NHS England pilot in July 2015, GP surgeries in Dudley have been utilising the skills of pharmacists in practice settings since 2002. As part of Dudley CCG's Prescribing and Medicines Management Function, the CCG commissions the services of a team of practice-based pharmacists (PBPs) to promote safe, high quality and efficient prescribing within Dudley. The majority of these PBPs are independent prescribers[1] and, in addition to a focus on the promotion of appropriate and cost-effective prescribing, the service provided by the PBPs has become increasingly clinically focussed.

While evidence of the effectiveness and cost-effectiveness of pharmacist activity in GP surgeries is generally lacking, a 2014 systematic review found that pharmacists deliver a range of interventions in general practice and these services often have beneficial impacts on outcomes in chronic diseases, principally in diabetes and cardiovascular disease, and in improving the quality of medication management services.(5) The majority of studies identified by this review were based in the United States with literature examining pharmacist activity in GP practices in England being sparse. However, two English-based randomised controlled trials suggest that pharmacist review of medication is effective at controlling prescribing expenditure.(6,7) Whilst the lack of evidence of effectiveness and cost-effectiveness of PBPs specifically is not surprising, given the relatively small number of pre-NHS England pilot PBPs and the comparatively recent announcement of the pilot, if the PBP model is to be accepted and embedded in general practice it is vital that thorough evaluation around effectiveness and cost-effectiveness is conducted.

The aim of the research reported here was to characterise PBP activity in Dudley CCG. The research had the following objectives:

- To describe the breadth and volume of interventions conducted by PBPs; and,
- To provide quantitative estimates of both the savings in GP time and the financial savings attributable to PBP activity.

METHODS

This descriptive observational study used quantitative data collected by the Pharmaceutical Public Health Team within Dudley CCG to analyse retrospectively PBP activity during 2015. Data covering the period from April to December 2015 were collected by the Pharmaceutical Public Health Team within Dudley CCG. These activity data were routinely entered into a bespoke database by PBPs as per their work protocols. Data were extracted from the database in the form of spreadsheets which were then supplied to the authors.

Fields included in the spreadsheets were:

- The date that the activity took place.
- The name of the GP practice where the activity took place.
- A unique PBP identifier.
- The type of activity undertaken. Activities were selected from a ‘dropdown’ list of 20 pre-coded options (these can be found in Table 1). The options were defined by service leads and training was provided to PBPs to promote the consistent and appropriate use of these options. Only one type of activity could be accepted per intervention.
- The number of potential interventions identified by PBPs.
- The number of potential interventions identified by PBPs which were subsequently completed.
- Financial savings realised by the identified interventions which were completed.

Following an update to the data collection sheets to enable quantification of resource allocation, the spreadsheets for the months of September through December 2015 included the following additional information:

- The number of GP appointments avoided as a result of the identified interventions which were completed.
- Amount of GP time saved by the involvement of the PBP in the review or reconciliation of medicines.
- Amount of GP time saved by the involvement of the PBP in the management of repeat prescriptions.

Data were manipulated and collated into one ‘master’ document in Microsoft Excel 2013®. To this master document, the patient list size of each GP practice was added. This enabled per population comparisons between interventions at different GP practices.

Data were analysed in Microsoft Excel®. Analysis was descriptive with assessment of central tendency and variability. Where available, data on the number of GP appointments saved, GP time saved by the involvement of PBPs in the review and reconciliation of medicines and GP time saved by the involvement of PBPs in the management of repeat prescriptions were exported from the master document and imported to a new document specifically for costs analysis. Unit costs for GP services were extracted from the Unit Costs of Health and Social Care 2015 – produced by the Personal Social Services Research Unit at the University of Kent – and added to these data to enable an estimation of financial savings resulting from the transference of GP activity to PBPs.(8)

Ethical approval for this work was not sought as the research was limited to secondary use of information previously collected in the course of normal care and the research involved no patient identifiable information.(9) The research was considered to be a 'service evaluation' by Dudley CCG.

RESULTS

Over the period April-December 2015, 23 PBPs (5.4 whole time equivalent) operating in 49 GP practices within Dudley CCG identified 23,172 interventions. The median number of interventions identified per month was 2,433 (interquartile range (IQR) ±1352) and the median number of interventions identified per GP practice was 210 (IQR ±331). Of the identified interventions, 95% (n=21,954) were completed by practices within the study period. The number of interventions completed per 1,000 listed patients varied considerably between practices ranging from 4 per 1,000 to 1,131 per 1,000 listed patients (median = 43 (IQR±40))[2].

The type of interventions suggested by PBPs within Dudley CCG, the volume of these interventions identified and subsequently completed, and the savings attributable to these interventions can be seen in Table 1. Both the nature and volume of interventions varied markedly. The most common type of intervention completed was 'medication reviews' (n=4,413)[3]. The interventions completed yielded a total of £1,079,864 in savings (assuming activity was consistent throughout the calendar year, this would equate to an annual saving of £1,439,819). The type of activity yielding the highest financial saving (£355,491) was 'planned changes to

medicines/ QIPP' and the most productive type of intervention was the review of 'specials' (yielding savings of £1,147 per completed intervention).

Using data on the number of GP appointments and GP time saved for the months of September through December 2015, Table 2 provides information on the time and financial savings attributable to the transference of activity away from GPs to PBPs in Dudley (as opposed to the savings directly attributable to the interventions completed which are described above). Activities transferred from GPs to PBPs were patient consultations (ranging from consultations for minor ailments through to the management of long term conditions; with an emphasis on the latter), review or reconciliation of medicines and the management of repeat prescriptions. If the savings reported in the September to December period were consistent throughout the year, this would equate to an annual saving of 1,884 GP appointments, a saving of an additional 2,309 hours that GPs in Dudley currently devote to medication review/reconciliation and the management of repeat prescribing, and financial savings totalling £354,643.

Total annual savings (i.e. savings attributable to the interventions of PBPs detailed in Table 1 and the savings attributable to the transference of activity away from GPs to PBPs detailed in Table 2) attributable to PBP activities in Dudley CCG are estimated at £1,794,462. This equates to a saving of £149,538 per calendar month or £3,052 per GP practice per month. These figures exclude costs related to the provision of PBPs as these are currently met by the CCG rather than by the practices themselves.

Labour costs attributable to PBP provision for the period April to December 2015 were £234,990. This was comprised of 7,833 hours of PBP input at an average hourly rate of £30 per hour (the majority of PBPs in Dudley CCG are contractors and are not directly employed by the CCG). Extrapolating from this figure for 9 months' worth of PBP provision, the annual costs of PBP provision can be estimated as £313,320 comprising of 10,444 hours of PBP activity. In terms of return on investment (ROI), using the formula ROI = (total savings generated – the costs of PBP provision)/the costs of PBP provision, the data analysed in this work suggest that for every £1 invested in PBP provision, savings of £4.73 may be realised (for every hour of PBP activity costing £30, savings of £141.82 may be realised).

DISCUSSION

Over the nine month period for which data were available, PBPs operating in practices within Dudley CCG identified 23,172 interventions, 95% of which went on to be implemented within GP practices. The annual financial saving to the CCG attributable to PBP activity was estimated to be approximately £1.5 million (inclusive of labour costs).

The use of PBPs in Dudley predates the NHS England 'Clinical Pharmacists in General Practice' pilot and, as such, the data presented here on the nature and volume of interventions, and the potential savings attributable to PBP activity may be some of the first data available in this area. While there is no published plan of evaluation for the NHS England pilot, the differences in the model adopted by Dudley CCG – where provision of PBPs is funded centrally and the CCG provides clinical

and systems leadership, supervision and action planning – and the model adopted in the NHS England pilot – where funding is delivered directly to the GP practices – mean that any results which emanate from the NHS England pilot may not be directly comparable to the results presented in this manuscript. Furthermore, this study was reliant on data from one English CCG meaning that the results reported are unlikely to be generalisable across primary care in England.

Neither patient outcomes nor patient or GP acceptability of the PBP programme were explored in this study. While training was provided to PBPs to promote the consistent coding of activity data, no assessment of potential inter-PBP variability in coding was made. Perhaps the most notable limitation of this study concerns the assumptions and extrapolations that have been included in this manuscript. The validity of such assumptions and the reliability of such extrapolations is difficult to accurately assess and figures reliant on such extrapolations should be treated with an appropriate degree of caution.

PBPs identified a number of different types of intervention and a large majority of all types of identified intervention were completed by GP practices within the study period. This suggests that the interventions proposed by PBPs are valued as either clinically or financially beneficial (or both) by GPs. Data on PBP time spent at each GP practice were not available but it is plausible that the variance in the number of completed interventions between GP practices is a function of the amount of PBP time spent at each practice.

Using the assumptions and extrapolations detailed in the results, the PBP programme in Dudley as currently delivered may generate total savings in excess of £1.5 million per annum. Specific evidence from general practice in England is lacking but previous work has suggested that pharmacist involvement in general practice may help to control expenditure.(6,7) Whilst the absence of specific patient outcomes from the dataset makes an assessment of cost-efficiency of the Dudley CCG PBP programme impossible, the estimated return on investment from PBP provision provides promising early indications that the programme can assist the CCG in meeting the efficiency savings demanded of all NHS organisations and may also support ongoing workforce development in primary care.

It is recommended that longitudinal data monitoring continues and that such data are routinely analysed to ensure that the PBP programme in Dudley (and PBP programmes elsewhere) is meeting its aims and continues to offer a beneficial return on investment. Such monitoring would also increase the number of observations which would in turn provide greater insight as to the validity of the assumptions and improve the accuracy of the extrapolations contained in this manuscript. An assessment of the reasons for variability in the number of interventions per population between GP practices and whether this variability is justifiable should be conducted. Greater focus should also be placed on examining the effect of PBP interventions on patient outcomes. The case for this, given the volumes in which they are conducted, is perhaps strongest for medication reviews,

Further qualitative work should be conducted to add depth to the quantitative data presented here. Such work will be useful in establishing the perceptions of GPs,

PBPs and patients regarding this emerging role and may be able to identify potential areas of improvement in terms of service delivery. Given the absence of evidence supporting pharmacist activity in general practice, it is imperative that a robust assessment (e.g. a randomised controlled trial) of the effectiveness and cost-effectiveness of PBPs in improving patient outcomes is undertaken.

CONCLUSIONS

In this initial review of data emanating from the Dudley CCG PBP programme, the high completion rate of interventions identified by PBPs indicates that PBPs are able to deliver interventions which are valued by GPs in high volume. In doing so, PBPs were able to generate not inconsiderable financial returns on investment. Financial savings were accrued as a result of both the interventions suggested by PBPs and by the transference of activity away from ‘higher cost’ GPs to ‘lower cost’ PBPs.

This is an emerging field of practice for pharmacists and, as such, evidence regarding all aspects of said practice is lacking. As PBP activity in Dudley predates the introduction of NHS England’s ‘Clinical Pharmacists in General Practice Pilot’, the data presented in this manuscript may be some of the first data available in this area. Further work, ideally coordinated at the national level, is recommended to explore stakeholder perceptions of PBPs and their activities, and to examine the effectiveness and cost-effectiveness of PBPs in improving outcomes at both patient and system level. Such work is vital if this emerging model is to become embedded in the English NHS.

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383 **Table 1**: Interventions and savings by type of PBP activity, April-December 2015
384 (excluding savings attributable to the transference of activity away from GPs to
385 practice-based pharmacists)
386

	Number of interventions		Savings resulting from completed interventions (£)	
Activity	**Suggested**	**Completed (%)**	**Total**	**Per intervention**
Medication reviews[1]	4453	4413 (99)	125566	28
Other	4563	4349 (95)	133771	31
Planned changes to medication/QIPP	3986	3789 (95)	355491	94
Repeat prescribing & waste management	1894	1883 (99)	34143	18
Clinic	1708	1691 (99)	37226	22
Managing long term conditions (LTCs)	1767	1668 (94)	65275	39
Review of hospital discharge letters	1514	1514 (100)	10327	7
Audit	1857	1311 (71)	93184	71
Appliance/homecare[2]	335	327 (98)	19003	58
Wound care	272	265 (97)	3744	14
Involvement in specific campaigns	262	203 (77)	29972	148
Specials reviews	160	140 (88)	160534	1147
Review of hospital outpatient letters	128	128 (100)	10979	86
Drug monitoring and review of test results	120	120 (100)	0	0
Medication reconciliation[3]	77	77 (100)	320	4
Managing high risk drugs	53	53 (100)	305	6
Hospital admissions for patients with LTCs[4]	9	9 (100)	0	0
Quality Premium[5]	6	6 (100)	0	0
Triage & management of minor ailments	5	5 (100)	24	5
Input to multidisciplinary team meetings	3	3 (100)	0	0
Total	**23172**	**21954 (95)**	**1079864**	**49**

[1]For patients with LTCs conducted using the Dudley Medication Review template
[2]Appliance Contractor and homecare including the prescribing of sip feeds and appliances
[3]In patients transitioning from secondary to primary care
[4]Interventions to reduce hospital admissions as a result of medication in patients with LTCs
[5]Contribution to CCG locally agreed Quality Premium focussed on increasing hypertension diagnoses and increasing the number of patients diagnosed with hypertension with a blood pressure of <140/90 mmHg

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388 **Table 2:** GP time and financial savings attributable to transferral of activity away

389 from GPs to practice-based pharmacists, September-December 2015

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Activity	Number of GP appointments saved	GP time saved (hrs)	Financial savings resulting (£)
Patient consultations	628	122.5[1]	27632[2]
Medicines review/reconciliation	-	272.9	38199[3]
Repeat prescription management	-	374.2	52383[3]
Total	**628**	**769.6**	**118214**

[1]Based on the average length of a surgery consultation being 11.7 minutes as established by the GP Workload Survey 2006/07 and reported in Unit Costs of Health and Social Care 2015 by the Personal Social Services Research Unit at the University of Kent (8)
[2]Based on the unit cost of a patient contact lasting 11.7 minutes being £44 as reported in Unit Costs of Health and Social Care 2015 (8)
[3]Based on the unit costs of one hour of GMS activity being £140 as reported in Unit Costs of Health and Social Care 2015 (8)

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FOOTNOTES

[1]"*Independent prescribers are practitioners responsible and accountable for the assessment of patients with previously undiagnosed or diagnosed conditions and for decisions about the clinical management required, including prescribing.*"(10)

[2]Patient list size was unavailable for 2 of the 49 practices. This figure is based on the 47 practices for which patient list size was available.

[3]All medication reviews were conducted in line with the Dudley Medication Review Best Practice Guidelines.(11)

GLOSSARY

CCG – Clinical commissioning group; statutory NHS bodies responsible for the planning and commissioning of health care services for their local area.

NHS England – An executive non-departmental public body of the Department of Health which leads the National Health Service in England.

QIPP – Quality, Innovation, Productivity and Prevention; a large scale programme devised by the Department of Health to drive improvements in quality of care in the NHS whilst realising considerable efficiency savings.

Specials – "*Specials are unlicensed medicinal products manufactured in the UK for human use which have been specially prepared to meet a prescription ordered for individual patients without the need for the manufacturer to hold a marketing authorisation for the medicinal product concerned*".(12)