

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

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27

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31

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33 authors had access to the data set. JB and CAL analysed and interpreted the data.  
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36

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39 manuscript is based.

40

#### 41 **Conflict of interest statement**

42

43 JB and CL have no conflicts of interest to disclose.

44

45 DJ is employed by Dudley CCG.

46

47 JJ offers consultancy services to Dudley CCG.

48

49 CH is employed by Dudley CCG.

50

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

53

54 **ABSTRACT**

55

56 **Objectives**

57

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

63

64 **Methods**

65

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

69

70 **Key findings**

71

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

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

79

## 80 **Conclusions**

81

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

88

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

91 **INTRODUCTION**

92

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

106

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

116

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

131

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

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

137

## 138 **METHODS**

139

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

147

148 Fields included in the spreadsheets were:

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

162

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

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

172

173 Data were manipulated and collated into one 'master' document in Microsoft Excel  
174 2013®. To this master document, the patient list size of each GP practice was  
175 added. This enabled per population comparisons between interventions at different  
176 GP practices.

177

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

188

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

193

## 194 **RESULTS**

195

196 Over the period April-December 2015, 23 PBPs (5.4 whole time equivalent)  
197 operating in 49 GP practices within Dudley CCG identified 23,172 interventions. The  
198 median number of interventions identified per month was 2,433 (interquartile range  
199 (IQR)  $\pm 1352$ ) and the median number of interventions identified per GP practice was  
200 210 (IQR  $\pm 331$ ). Of the identified interventions, 95% (n=21,954) were completed by  
201 practices within the study period. The number of interventions completed per 1,000  
202 listed patients varied considerably between practices ranging from 4 per 1,000 to  
203 1,131 per 1,000 listed patients (median = 43 (IQR $\pm 40$ ))<sup>2</sup>.

204

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

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

215

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

229

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

237

238 Labour costs attributable to PBP provision for the period April to December 2015  
239 were £234,990. This was comprised of 7,833 hours of PBP input at an average  
240 hourly rate of £30 per hour (the majority of PBPs in Dudley CCG are contractors and  
241 are not directly employed by the CCG). Extrapolating from this figure for 9 months'  
242 worth of PBP provision, the annual costs of PBP provision can be estimated as  
243 £313,320 comprising of 10,444 hours of PBP activity. In terms of return on  
244 investment (ROI), using the formula  $ROI = \frac{\text{total savings generated} - \text{the costs of PBP provision}}{\text{the costs of PBP provision}}$ , the data analysed in this work suggest  
245 that for every £1 invested in PBP provision, savings of £4.73 may be realised (for  
246 every hour of PBP activity costing £30, savings of £141.82 may be realised).

248

## 249 **DISCUSSION**

250

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

256

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

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

269

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

278

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

286

287 Using the assumptions and extrapolations detailed in the results, the PBP  
288 programme in Dudley as currently delivered may generate total savings in excess of  
289 £1.5 million per annum. Specific evidence from general practice in England is lacking  
290 but previous work has suggested that pharmacist involvement in general practice  
291 may help to control expenditure.(6,7) Whilst the absence of specific patient outcomes  
292 from the dataset makes an assessment of cost-efficiency of the Dudley CCG PBP  
293 programme impossible, the estimated return on investment from PBP provision  
294 provides promising early indications that the programme can assist the CCG in  
295 meeting the efficiency savings demanded of all NHS organisations and may also  
296 support ongoing workforce development in primary care.

297

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

309

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

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

317

## 318 **CONCLUSIONS**

319

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

326

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

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381

382

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

Activity	Number of interventions		Savings resulting from completed interventions (£)	
	Suggested	Completed (%)	Total	Per intervention
Medication reviews <sup>1</sup>	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 <sup>2</sup>	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 <sup>3</sup>	77	77 (100)	320	4
Managing high risk drugs	53	53 (100)	305	6
Hospital admissions for patients with LTCs <sup>4</sup>	9	9 (100)	0	0
Quality Premium <sup>5</sup>	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
<b>Total</b>	<b>23172</b>	<b>21954 (95)</b>	<b>1079864</b>	<b>49</b>

<sup>1</sup>For patients with LTCs conducted using the Dudley Medication Review template

<sup>2</sup>Appliance Contractor and homecare including the prescribing of sip feeds and appliances

<sup>3</sup>In patients transitioning from secondary to primary care

<sup>4</sup>Interventions to reduce hospital admissions as a result of medication in patients with LTCs

<sup>5</sup>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

387

388 **Table 2:** GP time and financial savings attributable to transferral of activity away  
 389 from GPs to practice-based pharmacists, September-December 2015

390

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

<sup>1</sup>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)

<sup>2</sup>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)

<sup>3</sup>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)

391

392

393 **FOOTNOTES**

394

395 <sup>1</sup>*“Independent prescribers are practitioners responsible and accountable for the*  
396 *assessment of patients with previously undiagnosed or diagnosed conditions and for*  
397 *decisions about the clinical management required, including prescribing.”(10)*

398

399 <sup>2</sup>Patient list size was unavailable for 2 of the 49 practices. This figure is based on the  
400 47 practices for which patient list size was available.

401

402 <sup>3</sup>All medication reviews were conducted in line with the Dudley Medication Review  
403 Best Practice Guidelines.(11)

404

405 **GLOSSARY**

406

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

409

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

412

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

416

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