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# BMJ Open

## How timely is access to palliative care medicines in the community? A mixed methods study in a UK city

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4 **Title: How timely is access to palliative care medicines in the community? A**  
5 **mixed methods study in a UK city**  
6

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15  
16 **ABSTRACT**  
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18 **Objective:** To investigate timeliness of access to palliative medicines (PMs) from  
19 community pharmacies to inform palliative care service delivery.  
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22 **Design:** Mixed methods in two sequential phases: 1. Prospective audit of  
23 prescriptions (Px) and concurrent survey of patients/representatives collecting PMs  
24 from pharmacy; 2. Interviews with Community Pharmacists (CPs) and other  
25 healthcare professionals (HCPs).  
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29 **Setting:** Five community pharmacies in Sheffield, UK and healthcare professionals  
30 that deliver palliative care in that community.  
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33 **Participants:** Phase 1: Five CPs: two providing access to PMs within a Locally  
34 Commissioned Service (LCS) and three not in the LCS; 55 patients/representatives  
35 who completed the survey when accessing PMs; Phase 2: 16 HCPs, including 5  
36 Phase 1 CPs, were interviewed.  
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40 **Results:** The Px audit collected information on 75 prescriptions (75 patients) with  
41 271 individual PMs; 55 patients/representatives (73%) completed the survey.  
42 Patients/representatives reported 73% of PMs were needed urgently. In 80% of  
43 cases patients/representatives received all PMs on the first pharmacy visit. One in  
44 five had to travel to more than one pharmacy to access PMs. The range of PMs  
45 stocked by pharmacies was the key facilitating factor. CPs reported practical issues  
46 causing difficulty keeping PMs in stock and playing a reactive role with palliative  
47 prescriptions. Confidentiality concerns were cited by other HCPs who were reluctant  
48 to share key patient information proactively with pharmacy teams. Inadequate  
49 information transfer, lack of CP integration into the care of palliative patients, and  
50 poor HCP knowledge of which pharmacies stock PMs meant patients and their  
51 families were not always able to access PMs promptly.  
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4 **Conclusions:** Consistent routine information transfer and integration of pharmacy  
5 teams in the care of palliative patients are needed to achieve timely access to PMs.  
6 Commissioners of PM access schemes should review and monitor access. HCPs  
7 need to be routinely made aware and reminded about the service and its locations.  
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11 **Key Words:** palliative care; community pharmacy services; pharmacists;  
12 prescriptions; interprofessional issues  
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15 **Word Count** 5038  
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## 17 **Article Summary**

### 18 **Strengths and limitations of this study**

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22 This is the first published study to identify the relative impact of factors contributing to  
23 non-timely access to PMs.  
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27 This paper is the first in the UK to examine perspectives of community pharmacists  
28 (CPs), general practitioners (GPs) and other community healthcare professionals  
29 (HCPs) on factors supporting and hindering access to PMs.  
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33 Fewer pharmacies participated in the prescription data collection than anticipated  
34 and had fewer PM prescriptions than previous audits and prescribing data would  
35 suggest.  
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39 This is the first study to examine customer experience of accessing PMs and the  
40 survey achieved a high response rate and generated valuable information for HCPs  
41 and commissioners.  
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44 **Funding statement:** This work was supported by Pharmacy Research UK grant  
45 number GA10. The views expressed are those of the author(s) and not necessarily  
46 those of Pharmacy Research UK.  
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## INTRODUCTION

Population aging and an increase in those dying with complex multi-morbidity will increase the need for palliative care with predictions suggesting End-of-Life Care (EOLC) provision in the community and care homes needs to double by 2040.<sup>1</sup> UK strategy aims to improve accessibility to palliative care in the community<sup>2</sup> in alignment with research suggesting most people would prefer a home death with 80% not changing their preference as their illness progresses,<sup>3</sup> however resource issues in primary care can make attaining this very challenging. In particular, accessing medicines for symptom control towards the end-of-life is imperative in controlling pain and distress and to prevent unnecessary hospital admissions. Difficulties in predicting the end-of-life, especially in those with chronic illnesses who have an uncertain disease trajectory, can lead to an unpredictable yet urgent demand for Palliative Medicines (PMs) in the community.

For most patients in primary care the source of medicines is from their community pharmacy (retail pharmacy or “chemist shop”) however previous research and service audits show access to PMs such as injectable medicines used for symptom control towards the end-of-life may not be as timely as patients and their families may need and wish.<sup>4-6</sup> Pharmacies cannot stock every possible PM; local formularies help to address this in the UK. However knowledge on which PMs are listed in the formulary and those pharmacies holding stocks may be lacking among prescribers which could lead to Prescriptions (Px) being issued for ‘non-formulary’ items not on the approved local palliative care stock list and/or Px being presented to pharmacies that do not routinely hold PM stock.<sup>4-6-11</sup> Delays may also be caused by legal errors on Px necessitating the pharmacist make professional and ethical judgements in supporting patient care especially in the out-of-hours period.<sup>4-6-8</sup> (Stuart, J. 2013. ‘Investigating the prevalence and nature of controlled drugs prescribing errors identified in community pharmacies.’ Unpublished MSc dissertation, University of Strathclyde, UK.) There is a suggestion that hand-written Px may be particularly problematic due to higher Px error rate and out-of-hours presentation, and they are still in use in the UK for home visits.<sup>4-6-12</sup> (Stuart, J. 2013. ‘Investigating the prevalence and nature of controlled drugs prescribing errors identified in community pharmacies.’ Unpublished MSc dissertation, University of Strathclyde, UK.)

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4 Australian research on a proposed core set of PMs found that pharmacies stocked  
5 on average three out of the list of 12,<sup>10</sup> while a systems analysis in Ireland found that  
6 not stocking PMs in the pharmacy was the most likely factor leading to delays<sup>9</sup> and  
7 this has also been found in the UK.<sup>4 6 8 11</sup> Reported contributory factors include: the  
8 unpredictable nature of PM Px requests; national stock shortages; the Px of PMs or  
9 strengths not on the recommended palliative care stock list; unlicensed medicines;  
10 errors on Controlled Drug (CD) Pxs and the inability to contact the prescriber, for  
11 instance outside GP (family doctor) practice opening hours.<sup>4 8 12</sup>

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18 Community pharmacies may take part in local or nationally commissioned services  
19 to support access to PMs in the community. In England, a Locally Commissioned  
20 Service (LCS) can be provided by the local clinical commissioning group (CCG) or a  
21 Local Enhanced Service (LES) can be commissioned by NHS England Area Teams  
22 in response to public need. Such services differ across geographical regions and are  
23 not commissioned from all pharmacies, causing confusion for patients and their  
24 caregivers who are often involved in Px collection and medicines management when  
25 a patient's condition deteriorates.<sup>7 13-15</sup> Furthermore, a lack of monitoring of PM  
26 availability against those prescribed both within the pharmacy and by the  
27 commissioning body could mean PMs are not available when needed. (Aslett, M.  
28 and Wall-Hayes, L. 2015. 'Access to palliative drugs – community pharmacy scheme  
29 – audit.' Unpublished NHS audit report, Birmingham, UK)

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There is little research internationally on community pharmacists' (CPs) involvement  
in supporting timely access to PMs. Hence this study seeks to answer the question  
'What is the community pharmacist's role in the delivery of timely access to palliative  
care medicines.' Due to the dearth of published research particularly in the context of  
community pharmacy services in England the aim of this study was to evaluate  
timely access to PMs in the community pharmacy setting and make  
recommendations to inform the commissioning of services and future practice. The  
objectives were to:

- determine the timeliness of access to PMs in the community;
- investigate the prevalence and nature of prescribing errors on Pxs for PMs presented to community pharmacies and determine whether errors impact on access to urgent PMs;

- investigate processes for accessing PMs from pharmacies where a locally commissioned service (LCS) operates including referrals when PMs are not available;
- explore the views and experiences of CPs and other stakeholders on accessing PMs from community pharmacies.

## METHODS

This study used mixed methods across two sequential phases (See Table 1 for study overview) conducted in Sheffield, UK. Participants in both phases gave informed consent before taking part. Ethical approval was obtained from the University of Bradford.

**Table 1 Overview of study phases**

*Phase 1:*

Audit of palliative prescriptions meeting inclusion criteria in participating pharmacies from May - October 2016

Customer survey for those collecting palliative prescriptions in participating pharmacies from May - October 2016

*Phase 2:*

Semi-structured face-to-face interviews with pharmacists participating in Phase 1 and other healthcare professionals involved in palliative care in the community from September 2016 - March 2017

*Phase 1: Audit of PM supplies over six-month data collection period.* Sheffield pharmacies were recruited through e-bulletin sent by the Local Pharmaceutical Committee (LPC), fax invitation to LCS PM pharmacies (19 of the 128 in the city), and verbal invitation at a local pharmacy practice development event. CPs expressing interest in taking part were given an information leaflet and consent form via email providing further information and the study inclusion criteria. Eligible CPs participated in the LCS or usually dispensed thirty or more PM Pxs in a month based on NHS Digital Px data for opioid analgesics and midazolam dispensed in pharmacies in the region.<sup>16</sup> Exclusion criteria were: i) pharmacists who had worked in the UK for less than 12 months (to ensure participants were familiar with UK and local community pharmacy services), and ii) if the company or manager did not give

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3 permission for participation. None of the interested pharmacies had to be excluded  
4 based on these criteria.  
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7 A pragmatic approach to sample size was taken; the intention was to recruit up to 15  
8 pharmacies however only five CPs consented to participate, partly due to the  
9 unexpectedly low level of PM Pxs reported. Informed consent was obtained. EM  
10 personally visited each participating pharmacy to brief them on the project, data  
11 collection forms and answer any questions to enhance consistency of data  
12 collection.  
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18 Consenting pharmacies collected data on thirty consecutively presented Pxs which  
19 contained medicines likely to be prescribed for patients who are palliative i.e. in the  
20 last year of life, using criteria provided by the researcher to identify prescriptions. Px  
21 data was intended to be collected for a four-week period in May 2016 but due to the  
22 low level of palliative care Pxs all consenting pharmacies agreed to continue until  
23 October 2016. Pharmacy data collection forms were developed by EM and reviewed  
24 by JDM and piloted in one community pharmacy. The form recorded anonymised Px  
25 data including: first part of patient's postcode; names of medications on the Px;  
26 whether there was a legal or non-legal error on the Px and further information on  
27 how that error was resolved. Legal and non-legal Px errors were identified by the  
28 CPs and non-legal errors were classified by EM according to criteria within the  
29 PRACtICe study.<sup>17</sup> Further details on non-legal errors were completed on a separate  
30 form to allow EM to verify the classification. Previous research suggested that delays  
31 may be caused by doctors prescribing products not on the local stock list<sup>6 8</sup> hence  
32 where prescribers issued legally correct Pxs for products not recommended on the  
33 LCS PM stock list these were classified as non-legal errors. Subcutaneous items in  
34 the audit were checked by EM against the LCS stock list to identify non-formulary  
35 items in both LCS and non-LCS pharmacies.  
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50 Prescriptions were classified as urgent when i) the survey respondent stated it was  
51 urgent, ii) they included anticipatory subcutaneous medicines and PMs to be given  
52 by a syringe pump iii) they were from an out-of-hours provider. The date/time a Px  
53 was received by the pharmacy and the date/time when it was ready for collection  
54 were recorded by pharmacy staff.  
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3 *Survey of patients/representatives collecting PM prescriptions.* The national  
4 pharmacy contracting organisation the Pharmaceutical Services Negotiating  
5 Committee (PSNC) Community Pharmacy Patient Questionnaire (CPPQ)<sup>18</sup> was used  
6 as a basis to develop a short customer survey of experiences of patients and their  
7 representatives of collecting Pxs with PMs from the community pharmacy. Questions  
8 included the perceived urgency of the Px, the customer's previous use of the  
9 pharmacy, whether they were the patient or the patient's representative, whether  
10 they were able to access all required PMs, whether they had been referred to the  
11 pharmacy (e.g. by another healthcare professional) and whether they had to visit  
12 more than one pharmacy to access the PMs on the Px. When  
13 patients/representatives indicated that not all items were available they were given  
14 the option of completing a free text section to explain how they intended to get these  
15 items. A free text section allowed respondents to record their answer to 'are there  
16 any things that could have been improved to make your visit better?' The customer  
17 survey was developed by EM with input from JDM, AB, a hospice patient user co-  
18 ordinator and risk manager. It was piloted in one pharmacy, further refined and  
19 piloted with patients within a hospice day centre. Pharmacy teams were provided  
20 with a written briefing on how to introduce the survey to patients/representatives.  
21 Individuals collecting Pxs for PMs were invited to participate by pharmacy counter  
22 staff or the CP depending on the procedure decided upon by the pharmacy. A  
23 unique number was used to match the customer survey to the pharmacy data form  
24 to allow verification of the data and assess any discrepancies.  
25 Patients/representatives not attending the pharmacy, e.g. home deliveries and care  
26 home residents, did not complete the customer survey.

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45 *Phase 2: Semi-structured interviews with CPs and other HCPs involved in care of*  
46 *palliative patients.* EM conducted interviews with the five CPs participating in phase  
47 1 and with a purposive sample of other HCPs involved in palliative care in the  
48 community including GPs, community specialist palliative care team, community  
49 nurses, district nurses and intermediate care team members. HCPs were invited to  
50 participate via e-bulletin, email and through gate-keepers (practice managers and  
51 team leaders). Interviews were audio-recorded with consent and transcribed  
52 verbatim by EM. The interviews explored views and experiences of accessing PMs  
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3 in the community; factors that supported or hindered access and their knowledge of  
4 the LCS. The interview schedule is available on request from the authors.  
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### 7 **Data analysis**

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10 Prescription data were entered into and analysed using IBM SPSS® V.23 statistical  
11 software by EM. Frequencies and percentages were calculated for all categorical  
12 variables with mean and standard deviation calculated for time to process Pxs.  
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16 Interview transcripts were read by EM for content familiarisation then annotated and  
17 coded manually using a priori themes from the study objectives. Following  
18 development of an analytical framework, two over-arching themes were then used to  
19 'chart' the coded data: (1) timely access to PMs, (2) the community pharmacist's role  
20 in palliative care, using the Framework Method.<sup>19</sup> The framework was revised and  
21 iteratively refined with CW and AB against the coded interview transcripts with  
22 emergent themes and subthemes applied across the whole data set. Summaries of  
23 data were added within the framework to capture participant's views. Mapping and  
24 interpretation of findings compared similarities and contrasts between and across  
25 professional groups and was supported through discussion and reflection with AB  
26 and CW.  
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36 Data from both phases were then triangulated where two or more sources agreed or  
37 contrasted with each other to help explain the quantitative results of the study.  
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39 Triangulation enhanced the validity and reliability of the results and enabled  
40 integration of the findings, such that it was possible to make recommendations for  
41 practice improvement and identify issues for service commissioners to consider.  
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### 45 **Patient Involvement**

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47 The study was informed by research priorities in palliative care<sup>20</sup> and through EM's  
48 professional experience including discussion with patients and carers experiencing  
49 medicines access problems following admission to a hospice. The customer survey  
50 tool was developed and piloted with patients in a hospice day setting.  
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## RESULTS

### Participants in each phase of the study

*Phase 1 CP audit:* Participating pharmacies were diverse in that they included pharmacies classified as independent (having less than five branches) and multiple (having five or more branches); two provided access to PMs under an LCS and three did not. Pharmacy sites were a combination of high street/local parade of shops (3), and suburban (2) with both suburban pharmacies co-located with a GP practice. For pharmacies not consenting to take part, the main reason cited was small numbers of palliative care Pxs dispensed in the pharmacy.

*Customer survey:* Customer surveys were completed against 55/75 CP audit forms; response rate 73.3%. Non-completion related primarily to home deliveries and care home Pxs.

*Phase 2 CP and other HCP Interviews:* 16 individuals participated: CPs (5), GPs (3), Specialist Palliative Care Team (2), Community Nurses (5), and Intermediate Care Team (1). The five CPs were also involved in phase 1. Median interview durations were 51 minutes for CPs and 18.5 minutes for GPs and other HCPs.

### Phase 1: Prescription characteristics

A total of 271 Px items on 75 Px forms was recorded (range 2 to 33 per pharmacy, median 14) over the 6-month audit period with a mean number of 3.6 Px items per form. This included 68.3% ( $n = 185$ ) of PMs identified as urgent, 49.8% ( $n = 135$ ) containing subcutaneously administered PMs and 24.7% ( $n = 67$ ) containing subcutaneously administered CDs. In 91.1% ( $n = 123$ ) of cases, subcutaneous items were chosen from the LCS formulary stock list. Non-formulary choices were either different presentations of formulary items or items not on the LCS stock list (see Table 2). Varying strengths of midazolam ampoules accounted for 41.7% ( $n = 5$ ) of non-formulary choices.

**Table 2: Subcutaneous items and formulary status on the locally commissioned palliative service stock list**

Formulary or non-formulary item	Frequency	Percentage prevalence
Item included in LCS stock list	123	91.1%
Non-formulary item chosen was a different strength, size or presentation to the item on the LCS stock list	8	5.9%
Non-formulary item not on LCS formulary stock list	4	3.0%

Prescriptions were computer-generated ( $n = 245$ , 90.4%) or hand-written ( $n = 22$ , 8.1%), with no Pxs delivered electronically via the Electronic Prescription Service (EPS); missing data ( $n = 4$ , 1.5%). Most Pxs were written by NHS GPs providing in-hours services ( $n = 233$ , 86%), with out-of-hours GPs ( $n = 33$ , 12.2%) or specialist palliative care team ( $n = 5$ , 1.8%) writing the remainder. There were no non-medical prescriber (NMP) Pxs within the sample. Prescriptions were presented to the pharmacy during GP opening hours (from 9-6pm Monday to Friday) ( $n = 176$ , 64.9%) or outside GP hours (evenings and weekends) ( $n = 77$ , 28.4%); missing data on 6.6% of forms ( $n = 18$ ).

### Phase 1: Prescription audit

Legal problems arose in 1.1% ( $n = 3$ ) of Px items; all of which were computer-generated, not specifying a dose on a controlled drug (CD) given via infusion. There were no legal errors on handwritten Pxs for PMs. There was insufficient evidence of a difference between Px generation method and legal errors (Fisher's Exact 2-sided test,  $p = 0.052$ ). Other non-legal prescribing errors such as incomplete information, dose/ strength error, generic/ brand error, allergy, and quantity error occurred in

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4 3.0% ( $n = 8$ ) of items. Table 3 summarises prevalence of different medication  
5 problems on Pxs and table 4 indicates types of prescribing errors using categories  
6 as in the PRACtICe study.<sup>17</sup>  
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10 **Table 3: Prevalence of medication problems**

Type of medication problem	Total number of prescription items	Frequency of problem	Percentage prevalence
Legal problems	271	3	1.1%
Prescribing errors (see table 4)	271	8	3.0%
Out of stock with supplier	271	1	0.4%
Non-formulary LCS item requested	135	12	8.9%

**Table 4: Prescribing errors (n=271)**

Type of prescribing error	Frequency	Percentage prevalence
Incomplete information on prescription	2	0.7%
Dose / strength error	2	0.7%
Generic / Brand error	2	0.7%
Allergy	1	0.4%
Quantity error	1	0.4%

**Phase 1: Time to access urgent palliative care medicines**

Valid time data was available for 57.8% ( $n = 107$ ) of 185 urgent items ( $n = 73$  missing data;  $n = 5$  excluded where PMs unavailable and Px taken elsewhere and recorded as 0 minutes). Median time to process (time of Px receipt to time of complete supply of PMs) urgent PMs was 2 hours (10 minutes in LCS pharmacies and 5 hours in non-LCS pharmacies). The maximum time to process urgent PMs was 3 hours and 39 minutes within LCS pharmacies, and 47 hours and 15 minutes within non-LCS pharmacies (see figure 1).

The median time taken to access urgent medications (107) between pharmacies participating in the LCS and pharmacies not participating in the service was significantly different (independent samples median test  $p = 0.002$  at 95% confidence level); with pharmacies not participating in the LCS taking significantly longer than pharmacies in the LCS.

**Figure 1: Time taken for urgent palliative medicines between pharmacies (see separate file)**

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4 Legal errors had minimal effect on access as all urgent PMs with legal errors were  
5 available within 30 minutes of presentation. Legal errors were resolved by:  
6 contacting the nursing home to specify the dose to be given on a Px for PMs via a  
7 syringe driver using a community medicines administration record, using the  
8 pharmacy Patient Medication Record (PMR) to access information on a previously  
9 issued Px, and contacting the prescriber. The Summary Care Records (SCR) was  
10 not used to resolve errors in the Px audit sample.  
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### 16 **Phase 1: Customer Survey**

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19 Survey responses showed that representatives collected PMs on behalf of the  
20 patient (65.5%); for both themselves and the patient (1.8%); and patients collected  
21 their own PMs (32.7%); 72.9% of surveys overall indicating the Px included urgent  
22 item(s). All cases for urgent subcutaneous medications were collected by a  
23 representative on behalf of a patient. In 42.6% of cases the patient attended their  
24 usual pharmacy. Patients/representatives also indicated the pharmacy was:  
25 convenient (14.8%); one of several pharmacies used (20.4%), or that they had been  
26 referred to the pharmacy for the medications (21.8%).  
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33 In 80% of cases patients/representatives received all medications against the Px at  
34 the first pharmacy they visited. In 20% (11/55) one or more items on the Px was not  
35 available, in five of these the item(s) were urgent. Free text sections were completed  
36 for six of the 11 cases of unavailable items. Four indicated they would return to  
37 collect the item from the pharmacy and two said they would try another pharmacy to  
38 obtain the items.  
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44 Overall one in five patients/representatives had to go to more than one pharmacy to  
45 get urgently needed PMs, increasing to one in three for urgent subcutaneous  
46 injection Px items. One in every two patients/representatives referred to the  
47 pharmacy by another healthcare professional had to go to more than one pharmacy.  
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51 Thirteen respondents made additional comments on whether their experience could  
52 have been better. Comments were mostly positive: six indicated 'no', 'none', 'no fine'  
53 or similar phrase; five made comments on the staff or service: 'friendly services  
54 under difficult circumstances', 'no - staff really friendly and helpful, service was quick  
55 and efficient', 'Nothing – excellent and quick service'; and one explained 'nothing  
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3 much that would make it better, but I phone in advance to make sure my items are in  
4 stock'. One respondent requested to 'keep a stock of all required items'.  
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## 8 **Phase 2: Interview findings**

### 9 **Timely access**

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13 Community nurses and palliative care team staff described how they met the need  
14 for advanced planning to prescribe anticipatory medicines prior to the last days of life  
15 for patients where appropriate. They reported conducting an end of week check and  
16 balance to ensure sufficient stock for over the weekend when fewer staff were  
17 available. Specialist palliative care team staff also described making do with the  
18 medicines already available in the house for a syringe driver and then ordering  
19 medication for the next day. CPs recognised that the GP may be open to change the  
20 Px to an item that is available due to the need for timely access rather than waiting  
21 for the 'perfect combination' to be in stock.  
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### 29 **Challenges**

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32 CPs described practical issues in supplying PMs (Box 1) for example: stock ordering  
33 processes; CD cabinet size (to meet UK legal requirements for storage); an inability  
34 to return CD items to suppliers due to legal restrictions and wholesaler cut-off times  
35 for same-day deliveries. Furthermore, patient records and charts to check opioid  
36 dose changes and syringe drivers were often not accessible to them. Restrictions  
37 under the NHS England pharmacy contract for Medicines Use Reviews (MURs)  
38 meant pharmacists were unable to routinely see and review palliative patients unless  
39 they could physically attend the pharmacy.  
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### 47 **Knowledge of LCS**

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49 The three CPs who were not LCS providers knew of the LCS and how to refer a  
50 patient/carer if they did not have the requested medication available. Usually they  
51 would phone ahead to the LCS pharmacy to check the medication was available  
52 before making a referral. Often making a referral depended on whether the carer had  
53 access to a car. Other HCPs had little knowledge of either the LCS or the  
54 pharmacies commissioned to provide it (Box 2) but knew which pharmacies were  
55 likely to keep some PMs in stock. GPs generally thought that all pharmacies kept  
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4 some injectable PMs in stock but said they might ring in advance to check the  
5 medication was available if a supply was needed urgently.  
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### 8 GP practice systems

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10 GPs indicated that the GP prescribing system was helpful in ensuring a legally  
11 correct Px and ensuring the correct medication was prescribed according to local  
12 guidelines. The local CCG had implemented a template on the GP prescribing  
13 system to provide a 'suite' of PMs according to local last days of life algorithms which  
14 included some of the injectable medicines listed on the LCS formulary. Even so, in  
15 phase 1 several 'non-formulary' medications not on the local CCG stock list were  
16 prescribed and in phase 2 CPs in LCS pharmacies described non-compliance with  
17 the local formulary as a reason for a lack of timely access to PMs.  
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### 25 **Communication and Collaboration**

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27 Two pharmacies not in the LCS had worked more closely with GP practices to  
28 discuss and agree to stock a smaller subset of the LCS PMs; such pharmacies had  
29 similar response times to pharmacies in the LCS which stocked a wider range of  
30 medications. CPs reported that some patients/carers worked with pharmacy  
31 processes by contacting the pharmacy when they ordered a Px for a CD that might  
32 not be stocked. Community and specialist palliative care team staff described how  
33 they would suggest the pharmacist kept sufficient stock in when they had someone  
34 on a syringe driver or enormous quantities of injectable medications. There appeared  
35 to be some examples where excellent communication and collaboration existed  
36 between GPs, HCPs and CPs which resulted in more timely access for PMs.  
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38 However, concerns around patient confidentiality by GPs and other HCPs meant that  
39 more often this information was not shared with the pharmacy team in advance of  
40 receiving the Px.  
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## **Box 1 Community pharmacist interviews**

### ***Timely access***

*We can normally order things for the same day, if it's before midday we can get them [medicines] for 4 o'clock that afternoon. (P2, Community Pharmacist)*

### ***Challenges***

*We don't have an ability to be able to keep a lot [controlled drugs] and so we have a particular issue with the quantities that they write on the prescriptions sometimes which can impact on the next patient. (P4, Community Pharmacist)*

*We've only got very small CD cabinets...the more controlled drugs you keep the more issues you are going to have (P1, Community Pharmacist)*

*We've got three different strengths of oxycodone injection, and they [GPs] prescribe all three, and you might not have one, you might have the other...it's just so frustrating...you don't want to delay treatment for what is a really difficult time for the patient and the family...but unfortunately our hands are tied by the legislation and our ability to be able to alter any of these prescriptions (P4, Community Pharmacist)*

### ***Knowledge of Locally Commissioned Service / GP Practice Systems***

*The big problem is midazolam...so many strengths...volumes of ampoules...the GPs just pick one. (P5, Community Pharmacist)*

### ***Communication and Collaboration***

*So, the surgery down the road...one GP...rang us and said well what have you got in stock and what can you get, which I found really, really useful because as the prescription came in the stock came in and this thing was completely seamless (P3, Community Pharmacist)*

*The logistics of community and primary care don't support that [multidisciplinary working] as well with regards to the geographical locations of these people and with responsible pharmacist regulations. (P1, Community Pharmacist)*

## **Box 2 GP and other healthcare professional interviews**

### ***Timely access***

*...I could go in now and say, 'I need these drugs' (and the CP might say) 'Oh I can get them in for 11 o'clock tomorrow morning' [exasperated laugh] it's like that's not really very helpful, I need them now (HCP7, Community Healthcare Professional)*

*I think if just more chemists had the bog-standard stuff in. (HCP11, Community Healthcare Professional)*

*I'd be enquiring what medicines were available...I might know what I want to prescribe but there's no point if it's not there and it's going to lead to a delay (HCP2, GP)*

### ***Challenges***

*A GP won't prescribe a syringe driver ahead of time...but that means we are always being [sic] having to do it now not in a more considered way (HCP4, Community Healthcare Professional)*

### ***Knowledge of Locally Commissioned Service / GP Practice Systems***

*I don't know who's commissioned we just basically know which ones we go to that are more likely to have it. (HCP4, Community Healthcare Professional)*

*...relatives who are running right left and centre trying to get hold of these meds...there is a commissioned service...but we don't know who they are. (HCP1, Community Healthcare Professional)*

### ***Communication and Collaboration***

*When we were down at [previous community nurse location] ...there was a pharmacy next door so...if we had any quick questions, we would go and talk to them...they were more like part of the team (HCP7, Community Healthcare Professional)*

*...so sometimes by sharing knowledge with pharmacists I think we could get better results for patients (HCP4, Community Healthcare Professional)*

*...but you're limited by what you can tell them [pharmacists] obviously from a confidentiality point of view... (HCP11, Community Healthcare Professional)*

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*We don't communicate with them [community pharmacist] what the problem with the patient is we just prescribe the drugs... sometimes they can obviously work it out.*  
(HCP3, GP)

*I do have some slight reservations about them [pharmacists] knowing all those ins and outs...I'm not sure how wide that circle is in there [pharmacy]...I'd prefer it ...on just a case by case basis...to an identified clinician... (HCP10, GP)*

## DISCUSSION

Timeliness of access was found to primarily relate to medicines stocks held by CPs with legal errors playing a much smaller role having little impact on access to PMs in this study. Stock availability as a significant factor to support timely access has also been seen in previous studies.<sup>4 8-10</sup>

Study results indicate a low prevalence of legal errors on palliative care Pxs compared to previous unpublished UK audit data,<sup>12</sup> (Stuart, J. 2013. 'Investigating the prevalence and nature of controlled drugs prescribing errors identified in community pharmacies.' Unpublished MSc dissertation, University of Strathclyde, UK.) in particular for handwritten Pxs and those issued by out-of-hours providers. All legal errors encountered related to the requirement to have a specific dose on a computer-generated Px for a controlled drug to be administered subcutaneously via a syringe pump. In this study and in Stuart, errors were four times more likely for injectable products compared to non-injectable products (Stuart, J. 2013.

'Investigating the prevalence and nature of controlled drugs prescribing errors identified in community pharmacies.' Unpublished MSc dissertation, University of Strathclyde, UK.) Legal errors relate to the statutory CD Px writing requirements in the Misuse of Drugs Act 1971<sup>21</sup> (and subsequent amendments) and the Medicines Act 1968<sup>22</sup> that specify that the Px must include a specific dose. As a patient deteriorates towards the end-of-life, frequent dose changes may be required for medication administered in a syringe pump; prescribers can be reluctant to include a specific dose on the Px in case this subsequently causes an error or confusion for those administering the medication. The continuation of legal errors on

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4 subcutaneous Pxs in this study and previous studies<sup>4 8</sup>(Stuart, J. 2013. 'Investigating  
5 the prevalence and nature of controlled drugs prescribing errors identified in  
6 community pharmacies.' Unpublished MSc dissertation, University of Strathclyde,  
7 UK.) suggests a review of the legal requirements should be undertaken as it is  
8 questionable whether legislation set in 1971 is relevant to clinical practice today. The  
9 PM prescribing template introduced by the primary care organisation may have  
10 impacted positively, minimising the number of errors compared to previous studies. It  
11 is not possible to ascertain the effect of EPS on error rate or timeliness as no Pxs  
12 were delivered via EPS in this study. At the time of the data collection, CD Pxs could  
13 not be transferred via EPS; pilots within the first ten GP practices started in October  
14 2018.<sup>23</sup> Further studies should assess the impact of EPS on CD Pxs and access to  
15 PMs within community pharmacies.

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25 Our findings of differential time to access PMs between community pharmacies  
26 participating in a LCS for PMs and those that did not, indicates that a local scheme  
27 can enhance access. Those pharmacies working with local GP practices to keep a  
28 small range of PMs in stock had similar access times to those within the LCS,  
29 suggesting that such collaboration can also support more timely access and improve  
30 patient and carer experience. Such wider collaboration has been advocated within  
31 national policy drivers and enables greater integration of pharmacy teams in  
32 improving patient care.<sup>24-27</sup>

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40 Palliative patients often rely on family members and friends to support them with  
41 managing their medication especially towards the end-of-life.<sup>7 13 14</sup> Our findings show  
42 that some families have to obtain urgently required medicines from a pharmacy  
43 different than the one that usually supplied the patient's medicines. CPs cannot  
44 access other pharmacies' medicines supply records, so the patient's regular  
45 pharmacy may be unaware of supply requirements; it is unclear what effect these  
46 changes in continuity of care between pharmacies might have towards the end-of-  
47 life. As patients and their representatives are free to use any pharmacy, not needing  
48 to register like they do with GP practices, accessing information to allow fast access  
49 to the required medication could be difficult. A potential solution could be through  
50 having read and write access to SCR allowing the CP including the patient's regular,  
51 out-of-hours or LCS pharmacy to record patient care scenarios to ensure safe,  
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4 continuity of care of PMs. Variable accessibility and difficulties in use of SCR by  
5 CPs<sup>28</sup> may suggest wider access to patient records is required.  
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8 One in five patients/representatives accessing PMs had to go to more than one  
9 pharmacy. This is the first study to quantify the number of patients/representatives  
10 who had to visit more than one pharmacy to access PMs. The high number could be  
11 explained by a lack of awareness of the LCS since this is not advertised to the public  
12 and there was low awareness amongst HCPs and GPs in the interviews. There was  
13 a belief by some GPs that most pharmacies kept stocks of PMs and so they did not  
14 always ring in advance of writing a Px. An alternative explanation could be that  
15 pharmacies do not regularly check their stocks or carry enough PM stocks, causing  
16 difficulties if more than one Px is presented on the same day. Monitoring of LCS/LES  
17 services by commissioners may be deficient as demonstrated in an unpublished  
18 audit across a network of commissioned pharmacies in Birmingham. In this audit it  
19 was reported only one pharmacy out of nineteen held all PMs on the formulary list  
20 and some CPs were not aware that the scheme was active. (Aslett, M. and Wall-  
21 Hayes, L. 2015. 'Access to palliative drugs – community pharmacy scheme – audit.'  
22 Unpublished NHS audit report, Birmingham, UK) There was also evidence in phase  
23 1 of Pxs being written for items not on the LCS list which would not be usually  
24 stocked in the pharmacies. Further investigation of referral patterns from pharmacies  
25 not within the LCS and monitoring of pharmacies in the LCS may improve practice  
26 and caregivers' experience.  
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43 There are a few limitations which affect the interpretation/generalisability of the  
44 findings of this study. The small sample of participating pharmacies, missing data,  
45 reliance on CPs to identify Pxs and confounding factors such as time of day, number  
46 and type of staff working in the pharmacy may limit interpretation of the results and  
47 introduce a degree of bias. Also, it is possible that the timing of the study following  
48 the government announcement to make cuts in community pharmacy funding<sup>29</sup> could  
49 have had a negative impact on pharmacist motivation and recruitment to the study  
50 with pharmacists unwilling to undertake additional non-service tasks or research.  
51 Differences in the commissioning of access to PMs within England also may limit the  
52 findings as some services are commissioned by NHS England as Local Enhanced  
53 Services and others are commissioned locally by CCGs, with no standard service  
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4 specification stating the outcomes to be measured. Furthermore, the geographical  
5 restriction with data only collected in one city could limit application to other areas  
6 including those in remote locations, with different out-of-hours providers, and access  
7 to palliative care support in the community. Nevertheless this is the first published  
8 study to our knowledge to bring together Px data with stakeholder views and  
9 experiences on accessing PMs through community pharmacies in England and the  
10 methodology has enabled new insights into factors contributing to timely access.  
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## 18 **CONCLUSION**

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21 The findings of this study suggest that legal prescribing errors may now have only a  
22 small impact on access to urgent PMs from community pharmacies compared to  
23 stock availability and supply chain factors. The CPs decisions about which PMs to  
24 stock in the pharmacy impact on timeliness of access with participation in a locally  
25 commissioned scheme or collaboration with local prescribers likely to improve  
26 access to PMs. There are likely to be advantages to GP practices working with local  
27 pharmacies to keep a small range of PMs available. Likewise, local integration and  
28 collaboration including CP integration into the primary healthcare team is important  
29 to ensure timely access to PMs. Improved communication between pharmacies and  
30 other HCPs around pharmacy opening times and cut-off times for same-day delivery  
31 of medicines could also support access to PMs. Moving forward, NHS England will  
32 be supporting development and integration of CP services into primary care through  
33 its Pharmacy Integration Fund<sup>30</sup> and this may also improve interprofessional  
34 communication and access to PMs.  
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45 Further studies are needed investigating the effect of EPS and referral patterns on  
46 access to PMs and the effect on patient's continuity of care at the end-of-life.  
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## 52 **Funding**

53  
54 The funders had no input into the research design, collection, analysis or  
55 interpretation of the data; the writing of the paper; or the decision for publication.  
56 Funders conducted peer review of the original study design as part of the funding  
57 application.  
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Parts of this study have been previously presented at conferences and published as conference abstracts.

## Author Contributions

EM implemented the study, designed and piloted data collection tools, monitored data collection, wrote the analysis plan, analysed the data, wrote and piloted interview schedule, transcribed interviews, developed the thematic framework and drafted and revised the manuscript. JDM and AB supervised EM in planning and undertaking the study including study design, development of data collection tools, data analysis, drafting and revision of the manuscript.

Dr Christina Wong (CW), piloted the interview schedule, supported the qualitative data analysis and provided workplace supervision for EM as part of the study.

Statistical input provided by Dr Jon Silcock, University of Bradford.

## Competing interests

EM received research funding from Pharmacy Research UK and Sheffield Teaching Hospitals NHS Foundation Trust as well as support from St Luke's Hospice, Sheffield; JDM and AB are employees of University of Bradford, all these organisations might have an interest in the submitted work – in the previous three years. EM is Treasurer of the Association of Supportive and Palliative Care Pharmacy. AB and JDM report grants from Pharmacy Research UK during the conduct of the study. EM, JDM, CW and AB are all pharmacists registered with the General Pharmaceutical Council.



## **Ethics approval**

Ethical approval obtained 17<sup>th</sup> December 2015 from the Chair of the Biomedical, Natural, Physical and Health Sciences Ethics Panel, University of Bradford (approval reference E493).

## **Data sharing statement**

No additional data are available.

## **Patient Involvement**

The design of the study was based on EM's experience as a clinical pharmacist including discussions with patients and their families on accessing medicines. The research question was therefore derived from patients' and family carers' experience on accessing medicines towards the end-of-life. A Hospice Patient User Co-ordinator provided support with the customer survey based on their experience of conducting surveys. Furthermore, patients within a hospice day centre supported the piloting of the customer survey.

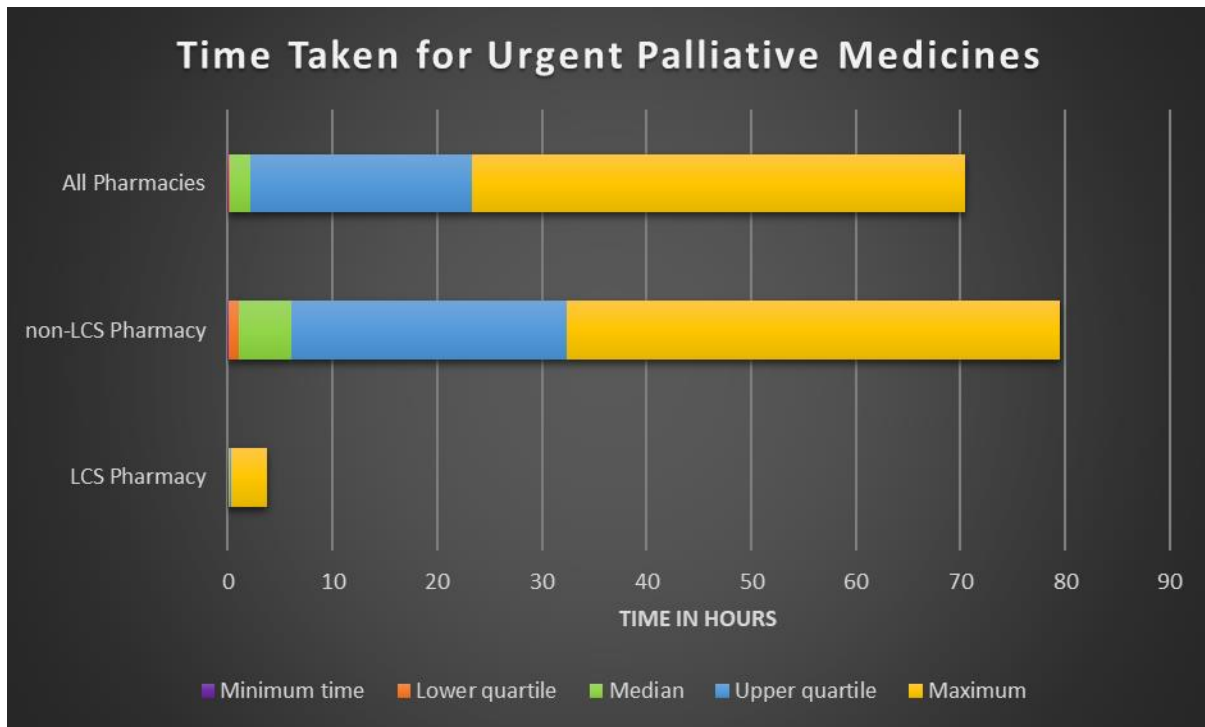
## References

1. Bone AE, Gomes B, Etkind SN, et al. What is the impact of population ageing on the future provision of end-of-life care? Population-based projections of place of death. *Palliat Med* 2018;32(2):329-36. doi: 10.1177/0269216317734435 [published Online First: 2017/10/11]
2. Department of Health (DH). End of Life Care Strategy *promoting high quality care for all adults at the end of life*. London: DH, 2008.
3. Gomes B, Calanzani N, Gysels M, et al. Heterogeneity and changes in preferences for dying at home: a systematic review. *BMC Palliat Care* 2013;12:7. doi: 10.1186/1472-684X-12-7 [published Online First: 2013/02/19]
4. Bennie M, Hudson S, Akram G, et al. Macmillan Pharmacist Facilitator Project six month baseline report. Scotland: University of Strathclyde, 2010.
5. Miller E, Morgan JD, Blenkinsopp A, et al. Are subcutaneous palliative medicines available and accessible: an out of hours (OOH) audit in sheffield: Abstract 61 Table 1. *BMJ Support Palliat Care* 2016;6(3):407.1-07. doi: 10.1136/bmjspcare-2016-001204.60
6. Savage I, Blenkinsopp A, Closs SJ, et al. 'Like doing a jigsaw with half the parts missing': community pharmacists and the management of cancer pain in the community. *Int J Pharm Pract* 2013;21(3):151-60. doi: 10.1111/j.2042-7174.2012.00245.x [published Online First: 2013/02/20]
7. Sheehy-Skeffington B, McLean S, Bramwell M, et al. Caregivers experiences of managing medications for palliative care patients at the end of life: a qualitative study. *Am J Hosp Palliat Care* 2014;31(2):148-54. doi: 10.1177/1049909113482514 [published Online First: 2014/02/15]
8. Akram G, Bennie M, McKellar S, et al. Effective delivery of pharmaceutical palliative care: challenges in the community pharmacy setting. *J Palliat Med* 2012;15(3):317-21. doi: 10.1089/jpm.2011.0262 [published Online First: 2012/02/22]

- 1  
2  
3 9. Lucey M, McQuillan R, MacCallion A, et al. Access to medications in the  
4  
5 community by patients in a palliative setting. A systems analysis. *Palliat Med*  
6  
7 2008;22(2):185-9. doi: 10.1177/0269216307085722 [published Online First:  
8  
9 2008/03/29]
- 10  
11 10. Tait PA, Gray J, Hakendorf P, et al. Community pharmacists: a forgotten  
12  
13 resource for palliative care. *BMJ Support Palliat Care* 2013;3(4):436-43. doi:  
14  
15 10.1136/bmjspcare-2012-000440 [published Online First: 2014/06/21]
- 16  
17 11. Faull C, Windridge K, Ockleford E, et al. Anticipatory prescribing in terminal care  
18  
19 at home: what challenges do community health professionals encounter? *BMJ*  
20  
21 *Support Palliat Care* 2013;3(1):91-7. doi: 10.1136/bmjspcare-2012-000193  
22  
23 [published Online First: 2014/03/20]
- 24  
25 12. MacRobbie A, Harrington G, Bennie M, et al. Macmillan Rural Palliative Care  
26  
27 Pharmacist Practitioner Project Phase 2 Report January 2015: University of  
28  
29 Strathclyde, 2015.
- 30  
31 13. Todd A, Holmes H, Pearson S, et al. 'I don't think I'd be frightened if the statins  
32  
33 went': a phenomenological qualitative study exploring medicines use in  
34  
35 palliative care patients, carers and healthcare professionals. *BMC Palliat Care*  
36  
37 2016;15:13. doi: 10.1186/s12904-016-0086-7 [published Online First:  
38  
39 2016/01/30]
- 40  
41 14. Joyce BT, Berman R, Lau DT. Formal and informal support of family caregivers  
42  
43 managing medications for patients who receive end-of-life care at home: a  
44  
45 cross-sectional survey of caregivers. *Palliat Med* 2014;28(9):1146-55. doi:  
46  
47 10.1177/0269216314535963 [published Online First: 2014/05/24]
- 48  
49 15. Payne S, Turner M, Seamark D, et al. Managing end of life medications at home-  
50  
51 accounts of bereaved family carers: a qualitative interview study. *BMJ*  
52  
53 *Support Palliat Care* 2015;5(2):181-8. doi: 10.1136/bmjspcare-2014-000658  
54  
55 [published Online First: 2014/09/27]
- 56  
57  
58  
59  
60

- 1  
2  
3 16. Prescribing and Primary Care Health and Social Care Information Centre  
4 (HSCIC). Prescriptions dispensed in the community England 2003-2013. v1.0  
5 ed. London: HSCIC, 2014.  
6  
7
- 8  
9 17. Avery T, Barber N, Ghaleb M, et al. Investigating the prevalence and causes of  
10 prescribing errors in general practice: The PRACtICe study (PRevalence And  
11 Causes of rescribing errors in general practiCe): General Medical Council,  
12 2012:1-227.  
13  
14
- 15  
16 18. Pharmaceutical Services Negotiating Committee. Community Pharmacy Patient  
17 Questionnaire (CPPQ) Internet [Available from: [https://psnc.org.uk/contract-](https://psnc.org.uk/contract-it/essential-service-clinical-governance/cppq/)  
18 [it/essential-service-clinical-governance/cppq/](https://psnc.org.uk/contract-it/essential-service-clinical-governance/cppq/) accessed 20th December 2018].  
19  
20  
21
- 22  
23 19. Gale NK, Heath G, Cameron E, et al. Using the framework method for the  
24 analysis of qualitative data in multi-disciplinary health research. *BMC Med*  
25 *Res Methodol* 2013;13:117. doi: 10.1186/1471-2288-13-117 [published Online  
26 First: 2013/09/21]  
27  
28
- 29  
30 20. James Lind Alliance. Palliative and End of Life Care Priority Setting Partnership,  
31 2015.  
32  
33
- 34  
35 21. Her Majesty's Government of the United Kingdom. Misuse of Drugs Act 1971:  
36 Queen's Printer of Acts of Parliament, 1971.  
37  
38
- 39  
40 22. Her Majesty's Government of the United Kingdom. Medicines Act 1968: Queen's  
41 Printer of Acts of Parliament, 1968.  
42  
43
- 44  
45 23. NHS Digital. Controlled drugs in the Electronic Prescription Service - NHS Digital  
46 [internet]2018 [accessed 20th December 2018].  
47  
48
- 49  
50 24. NHS England. Commissioning person centred end of life care - A toolkit for  
51 health and social care London: NHS England, 2016.  
52
- 53  
54 25. NHS England CQC, Health Education England, Monitor, Public Health England,  
55 Trust Development Authority,. Five Year Forward View. London: NHS  
56 England, 2014.  
57  
58
- 59  
60 26. England N. Next Steps on the NHS Five Year Forward View, 2017.

- 1  
2  
3 27. Baqir W, Paes P, Stoker A, et al. Pharmacy integrated care: the Northumberland  
4 Vanguard model. *Clinical Pharmacist* 2018;10(5):155-60. doi:  
5 10.1211/CP.2018.20204550  
6  
7  
8  
9 28. Robinson J. Majority of community pharmacists do not access the SCR in a  
10 typical week, analysis shows: *Pharmaceutical Journal*; 2018 [Available from:  
11 [https://www.pharmaceutical-journal.com/news-and-analysis/news/majority-of-](https://www.pharmaceutical-journal.com/news-and-analysis/news/majority-of-community-pharmacies-do-not-access-the-scr-in-a-typical-week-analysis-shows/20205645)  
12 [community-pharmacies-do-not-access-the-scr-in-a-typical-week-analysis-](https://www.pharmaceutical-journal.com/news-and-analysis/news/majority-of-community-pharmacies-do-not-access-the-scr-in-a-typical-week-analysis-shows/20205645)  
13 [shows/20205645](https://www.pharmaceutical-journal.com/news-and-analysis/news/majority-of-community-pharmacies-do-not-access-the-scr-in-a-typical-week-analysis-shows/20205645).article accessed 20th December 2018.  
14  
15  
16  
17  
18 29. Mundasad SBN. Many High Street pharmacies in England face closure, says  
19 minister. *BBC* 2016 27 January 2016.  
20  
21  
22  
23 30. NHS England. Pharmacy Integration Fund [Internet]2018 [Available from:  
24 [https://www.england.nhs.uk/commissioning/primary-](https://www.england.nhs.uk/commissioning/primary-care/pharmacy/integration-fund/)  
25 [care/pharmacy/integration-fund/](https://www.england.nhs.uk/commissioning/primary-care/pharmacy/integration-fund/) accessed 20th December 2018.  
26  
27  
28  
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Peer review only

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# BMJ Open

## How timely is access to palliative care medicines in the community? A mixed methods study in a UK city

Journal:	<i>BMJ Open</i>
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4 **Title: How timely is access to palliative care medicines in the community? A**  
5 **mixed methods study in a UK city**  
6

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16 **ABSTRACT**  
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18 **Objective:** To investigate timeliness of access to palliative medicines (PMs) from  
19 community pharmacies to inform palliative care service delivery.  
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22 **Design:** Mixed methods in two sequential phases: 1. Prospective audit of  
23 prescriptions and concurrent survey of patients/representatives collecting PMs from  
24 pharmacy; 2. Interviews with Community Pharmacists (CPs) and other healthcare  
25 professionals (HCPs).  
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30 **Setting:** Five community pharmacies in Sheffield, UK and healthcare professionals  
31 that deliver palliative care in that community.  
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34 **Participants:** Phase 1: Five CPs: two providing access to PMs within a Locally  
35 Commissioned Service (LCS) and three not in the LCS; 55 patients/representatives  
36 who completed the survey when accessing PMs; Phase 2: 16 HCPs, including 5  
37 Phase 1 CPs, were interviewed.  
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42 **Results:** The prescription audit collected information on 75 prescriptions (75  
43 patients) with 271 individual PMs; 55 patients/representatives (73%) completed the  
44 survey. Patients/representatives reported 73% of PMs were needed urgently. In 80%  
45 of cases patients/representatives received all PMs on the first pharmacy visit. One in  
46 five had to travel to more than one pharmacy to access PMs. The range of PMs  
47 stocked by pharmacies was the key facilitating factor. CPs reported practical issues  
48 causing difficulty keeping PMs in stock and playing a reactive role with palliative  
49 prescriptions. Confidentiality concerns were cited by other HCPs who were reluctant  
50 to share key patient information proactively with pharmacy teams. Inadequate  
51 information transfer, lack of CP integration into the care of palliative patients, and  
52 poor HCP knowledge of which pharmacies stock PMs meant patients and their  
53 families were not always able to access PMs promptly.  
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4 **Conclusions:** Consistent routine information transfer and integration of pharmacy  
5 teams in the care of palliative patients are needed to achieve timely access to PMs.  
6 Commissioners of PM access schemes should review and monitor access. HCPs  
7 need to be routinely made aware and reminded about the service and its locations.  
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11 **Key Words:** palliative care; community pharmacy services; pharmacists;  
12 prescriptions; interprofessional issues  
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15 **Word Count** 5302  
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## 17 **Article Summary**

### 18 **Strengths and limitations of this study**

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22 This is the first published study to identify the relative impact of factors contributing to  
23 non-timely access to PMs.  
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27 This paper is the first in the UK to examine perspectives of different (HCPs) on  
28 factors supporting and hindering access to PMs.  
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31 The study is also novel in its examination of customer experience of accessing PMs  
32 and the survey achieved a high response rate.  
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36 The study is possibly limited by the low number of sites but adds value to the  
37 literature in terms of barriers that need to be considered if more timely access to  
38 PMs is to be more widely implemented.  
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41 **Funding statement:** This work was supported by Pharmacy Research UK grant  
42 number GA10. The views expressed are those of the author(s) and not necessarily  
43 those of Pharmacy Research UK.  
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## INTRODUCTION

Population aging and an increase in those dying with complex multi-morbidity will increase the need for palliative care with predictions suggesting End-of-Life Care (EOLC) provision in the community and care homes needs to double by 2040.[1] In England, government strategy aims to improve accessibility to palliative care in the community[2] in alignment with research suggesting most people would prefer a home death with 80% not changing their preference as their illness progresses;[3] however resource issues in primary care can make attaining this very challenging. In particular, accessing medicines for symptom control towards the end-of-life is imperative in controlling pain and distress and to prevent unnecessary hospital admissions. Difficulties in predicting those who may die within 12 months who require EOLC[4] can lead to an unpredictable yet urgent demand for medicines to relieve symptoms towards the end-of-life in the community.

For most patients in primary care the source of medicines is from their community pharmacy (retail pharmacy or “chemist shop”); however previous research and service audits show access to medicines such as injectable medicines used for symptom control towards the end-of-life, which are referred to in this study as Palliative Medicines (PMs), may not be as timely as patients and their families may need and wish.[5–9] Pharmacies cannot stock every possible PM; local formularies which provide lists of preferred medicines help to address this in the UK.[7,8] However knowledge on which PMs are listed in the formulary and those pharmacies holding stocks may be lacking among prescribers[7,8] which could lead to prescriptions being issued for ‘non-formulary’ items not on the approved local PM list and/or prescriptions being presented to pharmacies that do not routinely hold PMs.[5–12] Delays may also be caused by legal errors on prescriptions where the prescription does not comply with legislation necessitating the pharmacist making professional and ethical judgements in supporting patient care especially in the out-of-hours period.[5,7,8] There is a suggestion that hand-written prescriptions may be particularly problematic due to higher prescription error rate and out-of-hours presentation[7,13,14] and they are still in use in the UK for home visits.[5,7,14]

Australian research on a proposed core set of PMs found that pharmacies stocked on average three out of the list of 12,[11] while a systems analysis in Ireland found that not stocking PMs in the pharmacy was the most likely factor leading to

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4 delays[10] and this has also been found in the UK.[5,7,8,12] Reported contributory  
5 factors include: the unpredictable nature of PM prescription requests; national stock  
6 shortages; the prescription of PMs or strengths not on the recommended list;  
7 unlicensed medicines; errors on Controlled Drug (CD) prescriptions and the inability  
8 to contact the prescriber, for instance outside GP (family doctor) practice opening  
9 hours.[5,8,14]  
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14 Community pharmacies may take part in local or nationally commissioned services  
15 to support access to PMs in the community. In England, a Locally Commissioned  
16 Service (LCS) can be provided by the local clinical commissioning group (CCG) or a  
17 Local Enhanced Service (LES) can be commissioned by NHS England Area Teams  
18 in response to public need.[15] Such services differ across geographical regions and  
19 are not commissioned from all pharmacies, causing confusion for patients and their  
20 caregivers who are often involved in prescription collection and medicines  
21 management when a patient's condition deteriorates.[9,16–18] Furthermore, a lack  
22 of monitoring of PM availability against those prescribed both within the pharmacy  
23 and by the commissioning body could mean PMs are not available when needed.  
24 (Aslett, M. and Wall-Hayes, L. 2015. 'Access to palliative drugs – community  
25 pharmacy scheme – audit.' Unpublished NHS audit report, Birmingham, UK)  
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35 There is little research internationally on community pharmacists' (CPs) involvement  
36 in supporting timely access to PMs. Hence this study seeks to answer the question  
37 'What barriers are encountered by community pharmacists in delivering timely  
38 access to palliative care medicines.' Due to the dearth of published research  
39 particularly in the context of community pharmacy services in England the aim of this  
40 study was to evaluate timely access to PMs in the community pharmacy setting and  
41 make recommendations to inform the commissioning of services and future practice.  
42 The objectives were to:  
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- 49     ▪ determine the timeliness of access to PMs in the community;
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- 51     ▪ investigate the prevalence and nature of prescribing errors on prescriptions
- 52 for PMs presented to community pharmacies and determine whether errors
- 53 impact on access to urgent PMs;
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- investigate processes for accessing PMs from pharmacies where a locally commissioned service (LCS) operates including referrals when PMs are not available;
- explore the views and experiences of CPs and other stakeholders on accessing PMs from community pharmacies.

## METHODS

This study used mixed methods across two sequential phases (See Table 1 for study overview) conducted in Sheffield, UK. Participants in both phases gave informed consent before taking part. Ethical approval was obtained from the University of Bradford.

**Table 1 Overview of study phases**

*Phase 1:*

Audit of palliative prescriptions meeting inclusion criteria in participating pharmacies from May - October 2016

Customer survey for those collecting palliative prescriptions in participating pharmacies from May - October 2016

*Phase 2:*

Semi-structured face-to-face interviews with pharmacists participating in Phase 1 and other healthcare professionals involved in palliative care in the community from September 2016 - March 2017

*Phase 1: Audit of PM supplies over six-month data collection period.* Sheffield pharmacies were recruited through e-bulletin sent by the Local Pharmaceutical Committee (LPC), fax invitation to LCS PM pharmacies (19 of the 128 in the city), and verbal invitation at a local pharmacy practice development event. CPs expressing interest in taking part were given an information leaflet and consent form via email providing further information and the study inclusion criteria. Eligible CPs participated in the LCS or usually dispensed thirty or more PM prescriptions in a month based on NHS Digital prescription data for opioid analgesics and midazolam dispensed in pharmacies in the region.[19] Exclusion criteria were: i) pharmacists who had worked in the UK for less than 12 months (to ensure participants were familiar with UK and local community pharmacy services), and ii) if the company or

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3 manager did not give permission for participation. None of the interested pharmacies  
4 had to be excluded based on these criteria.  
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7 A pragmatic approach to sample size was taken; the intention was to recruit up to 15  
8 pharmacies however only five CPs consented to participate, partly due to the  
9 unexpectedly low level of PM prescriptions reported. Informed consent was obtained.  
10 EM personally visited each participating pharmacy to brief them on the project, data  
11 collection forms and answer any questions to enhance consistency of data  
12 collection.  
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18 Consenting pharmacies collected data on thirty consecutively presented  
19 prescriptions which contained medicines likely to be prescribed for EOLC patients  
20 using criteria developed by EM. Eligible prescriptions were for adults aged 18 years  
21 or over and included one or more of the following: a long acting oral or transdermal  
22 strong opioid co-prescribed with a short acting opioid; fast acting fentanyl product;  
23 prescription of subcutaneous or syringe pump PMs, specified unlicensed medicines  
24 used in palliative care, as well as any prescription issued by the palliative care team.  
25 Prescription data was collected for six months between May to October 2016.  
26 Pharmacy data collection forms were developed by EM and reviewed by JDM and  
27 piloted in one community pharmacy. The form recorded anonymised prescription  
28 data including: names of medications on the prescription; whether there was a legal  
29 or non-legal error on the prescription and further information on how that error was  
30 resolved including whether the Summary Care Record (SCR) was accessed to  
31 resolve an error. Legal and non-legal prescription errors were identified by the CPs  
32 and non-legal errors were classified by EM according to criteria within the PRACTiCe  
33 study.[20] Further details on non-legal errors were completed on a separate form to  
34 allow EM to verify the classification. Previous research suggested that delays may  
35 be caused by doctors prescribing products not on the community pharmacy PMs  
36 list[7,8] (e.g. midazolam 5mg/5ml prescribed when midazolam 10mg/2ml on stock  
37 list) hence where prescribers issued legally correct prescriptions for products not  
38 recommended on the LCS PM list these were classified as non-legal errors.  
39 Subcutaneous items in the audit were checked by EM against the LCS list to identify  
40 non-formulary items in both LCS and non-LCS pharmacies.  
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3 Prescriptions were classified as urgent when i) the survey respondent stated it was  
4 urgent, ii) they included anticipatory subcutaneous medicines and/or PMs to be given  
5 by a syringe pump or iii) they were from an out-of-hours provider. The date/time a  
6 prescription was received by the pharmacy and the date/time when it was ready for  
7 collection were recorded by pharmacy staff.  
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12 *Survey of patients/representatives collecting PM prescriptions.* The national  
13 pharmacy contracting organisation the Pharmaceutical Services Negotiating  
14 Committee (PSNC) Community Pharmacy Patient Questionnaire (CPPQ)[21] was  
15 used as a basis to develop a short customer survey of experiences of patients and  
16 their representatives of collecting PM prescriptions from the community pharmacy.  
17 Questions included the perceived urgency of the prescription, the customer's  
18 previous use of the pharmacy, whether they were the patient or the patient's  
19 representative, whether they were able to access all required PMs, whether they had  
20 been referred to the pharmacy (e.g. by another HCP) and whether they had to visit  
21 more than one pharmacy to access the PMs on the prescription. When  
22 patients/representatives indicated that not all items were available they were given  
23 the option of completing a free text section to explain how they intended to get these  
24 items. A free text section allowed respondents to record their answer to 'are there  
25 any things that could have been improved to make your visit better?' The customer  
26 survey was developed by EM with input from JDM, AB, a hospice service user co-  
27 ordinator and risk manager. It was piloted in one pharmacy, further refined and  
28 piloted with patients within a hospice day centre. Pharmacy teams were provided  
29 with a written briefing on how to introduce the survey to patients/representatives.  
30 Individuals collecting prescriptions for PMs were invited to participate by pharmacy  
31 support staff or the CP depending on the pharmacy. A unique number was used to  
32 match the customer survey to the pharmacy data form to allow verification of the  
33 data and assess any discrepancies. Patients/representatives not attending the  
34 pharmacy, e.g. home deliveries and care home residents, did not complete the  
35 customer survey.  
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40 *Phase 2: Semi-structured interviews with CPs and other HCPs involved in care of*  
41 *palliative patients.* EM conducted interviews with the five CPs participating in phase  
42 1 and with a purposive sample of other HCPs involved in palliative care in the  
43 community including GPs, community specialist palliative care team, community  
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3 nurses, district nurses and intermediate care team members. HCPs were invited to  
4 participate via e-bulletin, email and through gatekeepers (practice managers and  
5 team leaders). Interviews were audio-recorded with consent and transcribed  
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7 verbatim by EM. The interviews explored views and experiences of accessing PMs  
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9 in the community; factors that supported or hindered access and their knowledge of  
10  
11 the LCS. The interview schedule is available on request from the authors.  
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## 14 **Data analysis**

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16 Prescription data were entered into and analysed using IBM SPSS® V.23 statistical  
17 software by EM. Frequencies and percentages were calculated for all categorical  
18 variables with mean and standard deviation calculated for time to process  
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20 prescriptions. Crosstabs was used to check relationship between legal or clinical  
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22 errors and prescription generation method.  
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26 Interview transcripts were read by EM for content familiarisation then annotated and  
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28 coded manually using a priori themes from the study objectives. Following  
29  
30 development of an analytical framework, two over-arching themes were then used to  
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32 'chart' the coded data: (1) timely access to PMs, (2) the community pharmacist's role  
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34 in palliative care, using the Framework Method.[22] The framework was revised and  
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36 iteratively refined with CW and AB against the coded interview transcripts with  
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38 emergent themes and subthemes applied across the whole data set. Summaries of  
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40 data were added within the framework to capture participants' views. Mapping and  
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42 interpretation of findings compared similarities and contrasts between and across  
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44 professional groups and was supported through discussion and reflection with AB  
45  
46 and CW.

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48 Data from both phases were then triangulated where two or more sources agreed or  
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50 contrasted with each other to help explain the quantitative results of the study.  
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52 Triangulation enhanced the validity and reliability of the results and enabled  
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54 integration of the findings, such that it was possible to make recommendations for  
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56 practice improvement and identify issues for service commissioners to consider.

## 57 **Patient Involvement**

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59 The study was informed by research priorities in palliative care[23] and through EM's  
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61 professional experience including discussion with patients and carers experiencing

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3 medicines access problems following admission to a hospice. The customer survey  
4 tool was developed and piloted with patients in a hospice setting.  
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## 8 **RESULTS**

### 9 10 **Participants in each phase of the study**

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12 *Phase 1 CP audit:* Participating pharmacies were diverse in that they included  
13 pharmacies classified as independent (having fewer than five branches) and multiple  
14 (having five or more branches); two provided access to PMs under an LCS and three  
15 did not. Pharmacy sites were a combination of high street/local parade of shops (3),  
16 and suburban (2) with both suburban pharmacies co-located with a GP practice. For  
17 pharmacies not consenting to take part, the main reason cited was small numbers of  
18 palliative care prescriptions dispensed in the pharmacy.  
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26 *Customer survey:* Customer surveys were completed against 55/75 CP audit forms;  
27 response rate 73.3%. Non-completion related primarily to home deliveries and care  
28 home prescriptions.  
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32 *Phase 2 CP and other HCP Interviews:* 16 individuals participated: CPs (5), GPs (3),  
33 Specialist Palliative Care Team (2), Community Nurses (5), and Intermediate Care  
34 Team (1). The five CPs were also involved in phase 1. Median interview durations  
35 were 51 minutes for CPs and 18.5 minutes for GPs and other HCPs.  
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### 40 **Phase 1: Prescription characteristics**

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42 A total of 271 prescription items on 75 prescription forms was recorded (range 2 to  
43 33 per pharmacy, median 14) over the 6-month audit period with a mean number of  
44 3.6 prescription items per form. This included 68.3% ( $n = 185$ ) of PMs identified as  
45 urgent, 49.8% ( $n = 135$ ) containing subcutaneously administered PMs and 24.7% ( $n$   
46 = 67) containing subcutaneously administered CDs. In 91.1% ( $n = 123$ ) of cases,  
47 subcutaneous items were chosen from the LCS formulary list. Non-formulary choices  
48 were either different presentations of formulary items (5.9%,  $n = 8$ ) or items not on  
49 the LCS list (3.0%,  $n = 4$ ). Varying strengths of midazolam ampoules accounted for  
50 41.7% ( $n = 5$ ) of non-formulary choices.  
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4 Prescriptions were computer-generated ( $n = 245$ , 90.4%) or hand-written ( $n = 22$ ,  
5 8.1%), with no prescriptions delivered electronically via the Electronic Prescription  
6 Service (EPS); missing data ( $n = 4$ , 1.5%). Most prescriptions were written by NHS  
7 GPs providing in-hours services ( $n = 233$ , 86%), with out-of-hours GPs ( $n = 33$ ,  
8 12.2%) or specialist palliative care team ( $n = 5$ , 1.8%) writing the remainder. There  
9 were no non-medical prescriber prescriptions within the sample. Prescriptions were  
10 presented to the pharmacy during GP opening hours (from 9-6pm Monday to Friday)  
11 ( $n = 176$ , 64.9%) or outside GP hours (evenings and weekends) ( $n = 77$ , 28.4%);  
12 missing data on 6.6% of forms ( $n = 18$ ).  
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### 20 **Phase 1: Prescription audit**

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22 Legal errors were present in 1.1% ( $n = 3$ ) of prescription items; all of which were  
23 computer-generated, not specifying a dose on a controlled drug (CD) given via  
24 infusion. There were no legal errors on handwritten prescriptions. There was  
25 insufficient evidence of a difference between prescription generation method and  
26 legal errors (Fisher's Exact 2-sided test,  $p = 0.052$ ). Other non-legal prescribing  
27 errors such as incomplete information, dose/ strength error, generic/ brand error,  
28 allergy, and quantity error occurred in 3.0% ( $n = 8$ ) of items. Table 2 summarises  
29 prevalence of different medication problems on prescriptions and table 3 indicates  
30 types of prescribing errors using categories as in the PRACTiCe study.[20]  
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**Table 2: Prevalence of medication problems**

Type of medication problem	Frequency of problem	Total number of prescription items	Percentage prevalence
Legal errors	3	271	1.1%
Prescribing errors (see table 3)	8	271	3.0%
Out of stock with supplier	1	271	0.4%
Non-formulary LCS item requested	12	135	8.9%

**Table 3: Prescribing errors (n=271)**

Type of prescribing error	Frequency	Percentage prevalence
Incomplete information on prescription	2	0.7%
Dose / strength error	2	0.7%
Generic / brand error	2	0.7%
Allergy <sup>1</sup>	1	0.4%
Quantity error	1	0.4%

<sup>1</sup> Allergy ascertained from patient or patient's medical record on pharmacy dispensing system

### Phase 1: Time to access urgent palliative care medicines

Valid time data was available for 57.8% ( $n = 107$ ) of 185 urgent items ( $n = 73$  missing data;  $n = 5$  excluded where PMs unavailable and prescription taken elsewhere and recorded as 0 minutes). Median time to process urgent PMs (time of prescription receipt to time of complete supply of PMs) was 2 hours (10 minutes in LCS pharmacies and 5 hours in non-LCS pharmacies). The maximum time to process urgent PMs was 3 hours and 39 minutes within LCS pharmacies, and 47 hours and 15 minutes within non-LCS pharmacies (see figure 1).

The median time taken to access urgent medications ( $n = 107$ ) between pharmacies participating in the LCS and pharmacies not participating in the service was significantly different (independent samples median test  $p = 0.002$  at 95% confidence level); with pharmacies not participating in the LCS taking significantly longer than pharmacies in the LCS.

#### Figure 1: Time taken to access urgent palliative medicines from community pharmacies (see separate file)

Legal errors had minimal effect on access as all urgent PMs with legal errors were available within 30 minutes of presentation. Legal errors were resolved by: contacting the nursing home to specify the dose to be given on a prescription for PMs via a syringe pump using a community medicines administration record, using the pharmacy Patient Medication Record (PMR) to access information on a previously issued prescription, and contacting the prescriber. The SCR was not used to resolve errors in the prescription audit sample.

### Phase 1: Customer Survey

Survey responses showed that representatives collected PMs on behalf of the patient (65.5%); for both themselves and the patient (1.8%); and patients collected their own PMs (32.7%); 72.9% of surveys overall indicating the prescription included urgent item(s). All cases for urgent subcutaneous medications were collected by a representative on behalf of a patient. In 42.6% of cases the patient attended their usual pharmacy. Patients/representatives also indicated the pharmacy was: convenient (14.8%); one of several pharmacies used (20.4%), or that they had been referred to the pharmacy for the medications (21.8%).

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4 In 80% of cases patients/representatives received all medications against the  
5 prescription at the first pharmacy they visited. In 20% (11/55) one or more items on  
6 the prescription was not available, in five of these the item(s) were urgent. Free text  
7 sections were completed for six of the 11 cases of unavailable items. Four indicated  
8 they would return to collect the item from the pharmacy and two said they would try  
9 another pharmacy to obtain the items.  
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15 Thirteen respondents made additional comments on whether their experience could  
16 have been better. Comments were mostly positive: six indicated 'no', 'none', 'no fine'  
17 or similar phrase; five made comments on the staff or service: 'friendly services  
18 under difficult circumstances', 'no - staff really friendly and helpful, service was quick  
19 and efficient', 'Nothing – excellent and quick service'; and one explained 'nothing  
20 much that would make it better, but I phone in advance to make sure my items are in  
21 stock'. One respondent requested to 'keep a stock of all required items'.  
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28 Overall one in five patients/representatives had to go to more than one pharmacy to  
29 get urgently needed PMs, increasing to one in three for urgent subcutaneous  
30 injection prescription items. One in every two patients/representatives referred to the  
31 pharmacy by another HCP had to go to more than one pharmacy. Data from the  
32 prescription audit and customer survey were triangulated to verify the validity of the  
33 information in phase 1.  
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## 38 **Phase 2: Interview findings**

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40 Findings from the interviews are presented in four sections: timely access;  
41 challenges; knowledge of LCS; and communication and collaboration. The findings  
42 are illustrated by verbatim quotes from the interviews where appropriate.  
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### 47 **Timely access**

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49 Anticipating need and forward planning were key themes to ensure timely access to  
50 PMs.  
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53 *... I could go in now and say, 'I need these drugs' (and the CP might say) 'Oh*  
54 *I can get them in for 11 o'clock tomorrow morning' [exasperated laugh] it's like*  
55 *that's not really very helpful, I need them now (HCP7, Community Healthcare*  
56 *Professional)*  
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4 Community nurses and palliative care team staff reported strategies to enhance  
5 access including conducting an end of week check and balance for those on syringe  
6 pumps to ensure sufficient stock for over the weekend when fewer staff were  
7 available. Specialist palliative care team staff also described making do with the  
8 medicines already available in the house and then ordering medication for the next  
9 day. CPs perceived that patients/HCPs phoning ahead for large quantities would be  
10 helpful. Insufficient quantities of PMs could adversely impact patient symptom  
11 management and had consequences for staff resources, however not all situations  
12 could be taken into consideration.  
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19 *... a GP won't prescribe a syringe driver ahead of time...we are*  
20 *always...having to do it now not in a more considered way* (HCP4,  
21 Community Healthcare Professional)  
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25 *... I remember having to go [to the pharmacy] in the middle of doing a*  
26 *[syringe] driver because there weren't enough drugs* (HCP8, Community  
27 Healthcare Professional)  
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32 The local CCG had implemented a template on the GP prescribing system to provide  
33 a 'suite' of PMs according to local last days of life algorithms which included some of  
34 the injectable medicines listed on the LCS formulary. Even so, in phase 1 several  
35 'non-formulary' medications not on the local CCG PM list were prescribed and in  
36 phase 2 CPs in LCS pharmacies described non-compliance with the local formulary  
37 as a reason for a lack of timely access to PMs.  
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42  
43 *We've got three different strengths of oxycodone injection, and they [GPs]*  
44 *prescribe all three, and you might not have one, you might have the*  
45 *other...it's just so frustrating...* (P4, Community Pharmacist)  
46  
47

48  
49 *The big problem is midazolam...so many strengths...volumes of*  
50 *ampoules...the GPs just pick one.* (P5, Community Pharmacist)  
51  
52

### 53 **Challenges**

54  
55 CPs described practical issues in supplying PMs for example: stock ordering  
56 processes including: timing of deliveries and the inability to return CD items to  
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4 suppliers due to legal restrictions; CD cabinet size (to meet UK legal requirements  
5 for storage); and quantities on prescriptions.  
6

7 *We don't have an ability to be able to keep a lot [controlled drugs] and so*  
8 *we have a particular issue with the quantities that they write on the*  
9 *prescriptions sometimes which can impact on the next patient (P4,*  
10 *Community Pharmacist)*  
11  
12  
13

14  
15 *We've only got very small CD cabinets...the more controlled drugs you*  
16 *keep the more issues you are going to have (P1, Community*  
17 *Pharmacist)*  
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21  
22 Furthermore, patient records and charts to check opioid dose changes and syringe  
23 pumps were often not accessible to CPs.  
24

25  
26 *With regards to changing doses or monitoring, I think that would be difficult for*  
27 *a community pharmacist. We have the summary care [record]... with palliative*  
28 *care the dose can change, you've got the pink card...sometimes we see [the*  
29 *pink card] and sometimes we don't (P2, Community Pharmacist)*  
30  
31  
32

33  
34 *... they [CPs] don't get the pink card [syringe pump chart] they simply get the*  
35 *prescription (HCP3, GP)*  
36  
37

38 *I might only need...extra diamorphine...whereas I might be using midazolam*  
39 *and haloperidol...but I've still got a supply of those, so they [CPs] don't always*  
40 *know what's in the [syringe] driver (HCP4, Community Healthcare*  
41 *Professional)*  
42  
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44

## 45 **Knowledge of LCS**

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48 HCPs had little knowledge of either the LCS or the pharmacies commissioned to  
49 provide it but knew which pharmacies were likely to keep some PMs in stock.  
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52  
53 *I don't know who's commissioned we just basically know which ones we go to*  
54 *that are more likely to have it. (HCP4, Community Healthcare Professional)*  
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4 ... relatives who are running right left and centre trying to get hold of these  
5 meds...there is a commissioned service...but we don't know who they are.  
6  
7 (HCP1, Community Healthcare Professional)  
8  
9

10 GPs generally thought that all pharmacies kept some injectable PMs in stock but  
11 said they might ring in advance to check the medication was available if a supply  
12 was needed urgently. Non-LCS pharmacist providers knew of the service and how to  
13 refer a patient/carer if they did not have the requested medication available. Usually  
14 they would phone ahead to the pharmacy to check the medication was available  
15 before making a referral. Being able to make a referral depended on whether the  
16 carer had access to a car.  
17  
18  
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21

22 ... if they haven't got a car it's sometimes a bit tricky (P1, Community  
23 Pharmacist)  
24  
25

## 26 **Communication and Collaboration**

27

28  
29 Participants described strategies to enhance access to PMs. Two non-LCS  
30 pharmacies had worked with GP practices to discuss and agree to stock a subset of  
31 the LCS PMs; they had similar response times to pharmacies in the LCS.  
32  
33

34 ... we went to them [GPs] and said, what are the most common drugs  
35 you would prescribe in palliative care...they [GPs] came back with a  
36 list...so we would try to keep the stock in for what they specified (P3,  
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Community Pharmacist)

CPs reported that some patients/carers contacted the pharmacy when they ordered  
a prescription for a CD that might not be stocked. Community and specialist palliative  
care team staff described how they would suggest the pharmacist kept sufficient  
stock when they had someone on a syringe pump or large quantities of injectable  
medications. There appeared to be some examples where excellent communication  
and collaboration existed between GPs, HCPs and CPs which resulted in more  
timely access for PMs.

... one GP...rang us and said well what have you got in stock and what  
can you get, which I found really, really useful because as the

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3 *prescription came in the stock came in and this thing was completely*  
4 *seamless (P3, Community Pharmacist)*  
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7  
8 *When we were down at [previous community nurse location] ...there was*  
9 *a pharmacy next door so...if we had any quick questions, we would go*  
10 *and talk to them...they were more like part of the team (HCP7,*  
11 *Community Healthcare Professional)*  
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15  
16 However, concerns around patient confidentiality by GPs and other HCPs meant that  
17 more often this information was not shared with the pharmacy team in advance of  
18 receiving the prescription.  
19

20  
21 *... but you're limited by what you can tell them [pharmacists] obviously*  
22 *from a confidentiality point of view... (HCP11, Community Healthcare*  
23 *Professional)*  
24  
25

26  
27 *We don't communicate with them [community pharmacist] what the problem*  
28 *with the patient is we just prescribe the drugs... sometimes they can obviously*  
29 *work it out. (HCP3, GP)*  
30  
31

32  
33 *I do have some slight reservations about them [pharmacists] knowing all*  
34 *those ins and outs...I'm not sure how wide that circle is in there*  
35 *[pharmacy]...I'd prefer it ...on just a case by case basis...to an identified*  
36 *clinician... (HCP10, GP)*  
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## 43 **DISCUSSION**

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45 The sequential use of mixed methods to firstly quantify the “problem” and then  
46 qualitative methods to provide context to the barriers to timely supply of PMs  
47 generated new insights into a longstanding problem. Timeliness of access was found  
48 to primarily relate to a mismatch between medicines stocks held by CPs and the  
49 PMs that GPs prescribed. Legal errors played a much smaller role and had little  
50 impact on access to PMs in this study. Stock availability as a significant factor to  
51 support timely access has also been seen in previous studies.[5,8,10,11]  
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58 Study results appear to indicate a low prevalence of legal errors on palliative care  
59 prescriptions taking into account the high volume of controlled drugs prescribed.  
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4 Previous studies suggest legal errors on prescriptions can range from less than 1%  
5 up to approximately 1.9% [14,20,24–28] though data does not specifically focus on  
6 palliative care prescriptions. Legal errors in the current study arose on computer-  
7 generated prescriptions for controlled drugs administered by a syringe pump. The  
8 proportion of errors is lower than may be anticipated given that 42% of these  
9 prescriptions were for controlled drugs; the primary care organisation prescribing  
10 template for PMs may have impacted positively, minimising the number of errors.  
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16 Our findings of differential time to access PMs between community pharmacies  
17 participating in the LCS for PMs and non-participants, indicates that a local service  
18 can enhance access. Those pharmacies working with local GP practices to keep a  
19 small agreed range of PMs in stock had similar access times to those within the  
20 LCS, suggesting that such collaboration can also support more timely access and  
21 improve patient and carer experience. Such wider collaboration has been advocated  
22 within national policy drivers and enables greater integration of pharmacy teams in  
23 improving patient care.[29-32] Some HCPs considered CPs “part of the team” but  
24 others saw them only in their “supply” role. Together with concerns about  
25 confidentiality this prevented many HCPs from communicating with CPs about  
26 available stock or giving advance warning to allow stock to be obtained in a more  
27 timely way. A particular concern seemed to be who else, in addition to the  
28 pharmacist, might have access to sensitive information. Commissioners could  
29 remind primary care staff of community pharmacy ethical and information  
30 governance practices to correct any misunderstandings. They could also encourage  
31 HCPs to be proactive in checking stock availability with the patient’s usual CP.  
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44 Palliative patients often rely on family members and friends to support them with  
45 managing their medication especially towards the end-of-life.[9,16-18] Our findings  
46 show that some families obtain urgently required medicines from a pharmacy  
47 different than the one that usually supplied the patient’s medicines. It is unclear what  
48 effect these changes in continuity of care between pharmacies might have towards  
49 the end-of-life, but this study shows that some CPs enhance access by calling other  
50 pharmacies to ascertain they have the PMs in stock. A potential solution could be  
51 through CPs having read and write access to SCR allowing them, whether they are  
52 the patient’s regular, out-of-hours or LCS pharmacy, to record patient care scenarios  
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4 to ensure safe, continuity of care of PMs. Variable accessibility and difficulties in use  
5 of SCR by CPs[33] may suggest wider access to patient records is required.  
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8 One in five patients/representatives accessing PMs had to go to more than one  
9 pharmacy. This is the first study to quantify the number of patients/representatives  
10 who had to do so, with associated inconvenience, wasted time and stress. This  
11 finding could be explained by a lack of awareness of the LCS since this is not  
12 advertised to the public and there was also low awareness amongst HCPs and GPs  
13 in the interviews. Monitoring of LCS/LES services by commissioners may not always  
14 be effective. One audit found only one of nineteen pharmacies held all PMs on the  
15 formulary list and some CPs were not aware that the scheme was active. (Aslett, M.  
16 and Wall-Hayes, L. 2015. 'Access to palliative drugs – community pharmacy scheme  
17 – audit.' Unpublished NHS audit report, Birmingham, UK) There was also evidence  
18 in phase 1 of prescriptions being written for items not on the LCS list which would not  
19 usually be stocked in the pharmacies. Commissioners' service audits could  
20 investigate referral patterns from pharmacies not within the LCS, and monitoring of  
21 LCS pharmacies may improve practice and caregivers' experience. Commissioners  
22 could also act to improve awareness of LCS among local HCPs.  
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36 Some limitations affect the interpretation/generalisability of the findings of this study.  
37 The small sample of participating pharmacies, missing data, reliance on CPs to  
38 identify prescriptions and confounding factors such as time of day, number and type  
39 of staff working in the pharmacy may limit interpretation of the results and introduce  
40 a degree of bias. Differences in the commissioning of access to PMs within England  
41 also may limit the findings as there is no standard service specification stating the  
42 outcomes to be measured. Furthermore, the geographical restriction with data only  
43 collected in one city could limit application to other areas including those in remote  
44 locations, with different out-of-hours providers, and access to palliative care support  
45 in the community. Nevertheless, the study adds value to the literature in terms of  
46 barriers that need to be considered if more timely access to PMs is to be more  
47 widely implemented and the methodology has enabled new insights into factors  
48 contributing to timely access.  
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## CONCLUSION

The findings of this study suggest that legal prescribing errors may now have a smaller impact on access to urgent PMs from community pharmacies compared to mismatches between stock availability and PMs prescribed. Both participation in a LCS or collaboration with local prescribers are likely to improve access to PMs.

### Recommendations for future commissioning and practice:

Commissioners should:

- i) encourage GP practices to work with local pharmacies to keep a small range of PMs available
- ii) remind HCPs of the ethical and information governance requirements of community pharmacies and encourage early contact to check stock availability
- iii) involve patients and the public in designing audits of LCS.

Community pharmacies should improve their communication with HCPs around pharmacy opening times and cut-off times for same-day delivery of medicines.

Moving forward, NHS England will be supporting development and integration of CP services into primary care through its Pharmacy Integration Fund[34] and this may also improve interprofessional communication and access to PMs.

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The funders had no input into the research design, collection, analysis or interpretation of the data; the writing of the paper; or the decision for publication. Funders conducted peer review of the original study design as part of the funding application.

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Parts of this study have been previously presented at conferences and published as conference abstracts.

## Author Contributions

EM implemented the study, designed and piloted data collection tools, monitored data collection, wrote the analysis plan, analysed the data, wrote and piloted interview schedule, transcribed interviews, developed the thematic framework and drafted and revised the manuscript. JDM and AB supervised EM in planning and undertaking the study including study design, development of data collection tools, data analysis, drafting and revision of the manuscript.

## Competing interests

EM received research funding from Pharmacy Research UK and Sheffield Teaching Hospitals NHS Foundation Trust as well as support from St Luke's Hospice, Sheffield; JDM and AB are employees of University of Bradford, all these organisations might have an interest in the submitted work – in the previous three years. EM is Treasurer of the Association of Supportive and Palliative Care Pharmacy. AB and JDM report grants from Pharmacy Research UK during the conduct of the study. EM, JDM, and AB are all pharmacists registered with the General Pharmaceutical Council.

### **Ethics approval**

Ethical approval obtained 17<sup>th</sup> December 2015 from the Chair of the Biomedical, Natural, Physical and Health Sciences Ethics Panel, University of Bradford (approval reference E493).

### **Data sharing statement**

Protocol and data collection forms are available upon request from the corresponding author.

### **Patient Involvement**

The design of the study was based on EM's experience as a clinical pharmacist including discussions with patients and their families on accessing medicines. The research question was therefore derived from patients' and family carers' experience on accessing medicines towards the end-of-life. A Hospice Service User Co-ordinator provided support with the customer survey based on their experience of conducting surveys. Furthermore, patients within a hospice day centre supported the piloting of the customer survey.

## References

- 1 Bone AE, Gomes B, Etkind SN, *et al.* What is the impact of population ageing on the future provision of end-of-life care ? Population-based projections of place of death. *Palliat Med* 2018;**32**:329-36. doi:10.1177/0269216317734435
- 2 Department of Health. *End of Life Care Strategy: Promoting high quality care for all adults at the end of life*. London: Department of Health, 2008.
- 3 Gomes B, Calanzani N, Gysels M, *et al.* Heterogeneity and changes in preferences for dying at home: A systematic review. *BMC Palliat Care* 2013;**12**:7. doi:10.1186/1472-684X-12-7
- 4 National Institute for Health and Care Excellence (NICE) - *End of life care for adults Quality Standard (QS13)*. London: NICE, 2017.
- 5 Bennie M, Hudson S, Akram G, *et al.* *Macmillan Pharmacist Facilitator Project Six Month Baseline Report – 2010*. Glasgow: University of Strathclyde, 2010. <https://www.palliativecareggc.org.uk/wp-content/uploads/2013/10/Macmillan-Report-FINAL-04-11-2010sh2MB-2.pdf> (accessed June 2019)
- 6 Miller E, Morgan JD, Blenkinsopp A, *et al.* Are subcutaneous palliative medicines available and accessible: an out of hours (OOH) audit in Sheffield: Abstract 61 Table 1. *BMJ Support Palliat Care* 2016;**6**:407. doi:10.1136/bmjspcare-2016-001204.60
- 7 Savage I, Blenkinsopp A, Closs SJ, *et al.* 'Like doing a jigsaw with half the parts missing': Community pharmacists and the management of cancer pain in the community. *Int J Pharm Pract* 2013;**21**:151–60. doi:10.1111/j.2042-7174.2012.00245.x
- 8 Akram G, Bennie M, McKellar S, *et al.* Effective delivery of pharmaceutical palliative care: challenges in the community pharmacy setting. *J Palliat Med* 2012;**15**(3):317-21. doi:10.1089/jpm.2011.0262
- 9 Sheehy-Skeffington B, McLean S, Bramwell M. Caregivers experiences of managing medications for palliative care patients at the end of life: a qualitative study. *Am J Hosp Palliat Care* 2014;**31**(2):148-154. doi:10.1177/1049909113482514
- 10 Lucey M, McQuillan R, MacCallion A, *et al.* Access to medications in the community by patients in a palliative setting. A systems analysis. *Palliat Med* 2008;**22**(2):185–9. doi:10.1177/0269216307085722

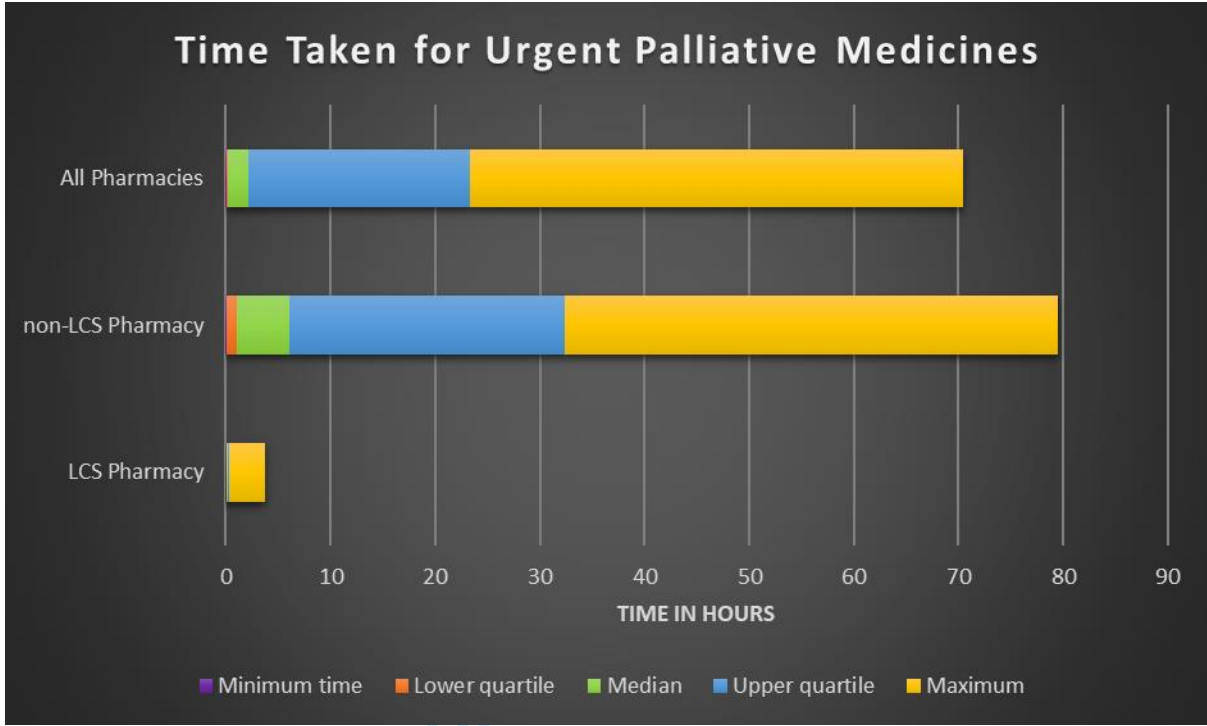
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56  
57  
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59  
60
- 11 Tait P, Gray J, Hakendorf P, *et al.* Community pharmacists: a forgotten resource for palliative care. *BMJ Support Palliat Care* 2013;**3**:436–43. doi:10.1136/bmjspcare-2012-000440
- 12 Faull C, Windridge K, Ockleford E, *et al.* Anticipatory prescribing in terminal care at home: what challenges do community health professionals encounter? *BMJ Support Palliat Care* 2013;**3**:91–7. doi:10.1136/bmjspcare-2012-000193
- 13 MacRobbie A, Bennie M, Akram G, *et al.* *Macmillan Rural Palliative Care Pharmacist Practitioner Project Mapping of the Current Service & Quality Improvement Plan*. Glasgow: University of Strathclyde, 2013. <https://www.nhshighland.scot.nhs.uk/Services/Documents/Palliative%20pharmacy%20project%202016/Macmillan%20RPCPP%20Project%20EXEC%20SUMMARY%2027112013.pdf> (accessed June 2019)
- 14 MacRobbie A, Harrington G, Bennie M, *et al.* *Macmillan Rural Palliative Care Pharmacist Practitioner Project Phase 2 Report*. Glasgow: University of Strathclyde, 2015. [https://www.nhshighland.scot.nhs.uk/Services/Documents/Palliative pharmacy project 2016/MRPP Phase 2 Full Report 2015.pdf](https://www.nhshighland.scot.nhs.uk/Services/Documents/Palliative%20pharmacy%20project%202016/MRPP%20Phase%202%20Full%20Report%202015.pdf) (accessed June 2019)
- 15 Pharmaceutical Services Negotiating Committee (PSNC). *Locally Commissioned Services*. PSNC, 2019. <https://psnc.org.uk/services-commissioning/locally-commissioned-services/> (accessed June 2019).
- 16 Todd A, Holmes H, Pearson S, *et al.* 'I don't think I'd be frightened if the statins went': a phenomenological qualitative study exploring medicines use in palliative care patients, carers and healthcare professionals. *BMC Palliat Care* 2016;**15**:13. doi:10.1186/s12904-016-0086-7
- 17 Joyce BT, Berman R, Lau DT. Formal and informal support of family caregivers managing medications for patients who receive end-of-life care at home: A cross-sectional survey of caregivers. *Palliat Med* 2014;**28**:1146–55. doi:10.1177/0269216314535963
- 18 Payne S, Turner M, Seamark D, *et al.* Managing end of life medications at home - accounts of bereaved family carers: a qualitative interview study. *BMJ Support Palliat Care* 2015;**5**:181–8. doi:10.1136/bmjspcare-2014-000658
- 19 Prescribing and Medicine Team, NHS Digital. *Prescriptions Dispensed in the Community - Statistics for England 2007-2017*. Leeds: NHS Digital, 2018;:1–86. <https://digital.nhs.uk/data-and->

- information/publications/statistical/prescriptions-dispensed-in-the-community/prescriptions-dispensed-in-the-community-england---2007---2017 (accessed June 2019)
- 20 Avery T, Barber N, Ghaleb B, *et al.* *Investigating the prevalence and causes of prescribing errors in general practice: The PRACTiCe Study (PRevalence And Causes of prescribing errors in general practiCe) A report for the General Medical Council (GMC)*. Manchester: GMC 2012;:1–187. doi:10.1.1.680.8379
- 21 Pharmaceutical Services Negotiating Committee (PSNC). *Community Pharmacy Patient Questionnaire (CPPQ)*: PSNC, 2019 <https://psnc.org.uk/contract-it/essential-service-clinical-governance/cppq/> (accessed June 2019).
- 22 Gale NK, Heath G, Cameron E, *et al.* Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Med Res Methodol* 2013;**13**:117. doi:10.1186/1471-2288-13-117
- 23 Palliative and end of life care Priority Setting Partnership (PeolcPSP). *Putting patients, carers and clinicians at the heart of palliative and end of life care research*. PeolcPSP, 2015. [https://palliativecarepsp.files.wordpress.com/2018/08/a812\\_jameslind\\_report.pdf](https://palliativecarepsp.files.wordpress.com/2018/08/a812_jameslind_report.pdf) (accessed June 2019).
- 24 Quinlan P, Ashcroft DM, Blenkinsopp A. Medication errors: a baseline survey of dispensing errors reported in community pharmacies. *Int J Pharm Pract* 2011;**10**:R68–R68. doi:10.1111/j.2042-7174.2002.tb00673.x
- 25 Sayers YM, Armstrong P, Hanley K. Prescribing errors in general practice: A prospective study. *Eur J Gen Pract* 2009;**15**:81–3. doi:10.1080/13814780802705984
- 26 Hawksworth GM, Corlett AJ, Wright DJ, *et al.* Clinical pharmacy interventions by community pharmacists during the dispensing process. *Br J Clin Pharmacol* 1999;**47**:695–700. doi:10.1046/j.1365-2125.1999.00964.x
- 27 Chen Y-F, Neil KE, Avery AJ, *et al.* Prescribing errors and other problems reported by community pharmacists. *Ther Clin Risk Manag* 2005;**1**(4):333–42. <http://www.ncbi.nlm.nih.gov/pubmed/18360575> (accessed June 2019).
- 28 Shah SNH, Aslam M, Avery AJ. A survey of prescription errors in general practice. *Pharm J* 2001;**267**(7178):860–2.
- 29 NHS England. *Commissioning person centred end of life care: A toolkit for*



- 1  
2  
3 *health and social care*. London: NHS England, 2016.  
4  
5 30 NHS England. *Five Year Forward View*. London: NHS England, 2014.  
6  
7 31 NHS England. *Next Steps on the NHS Five Year Forward View*. London: NHS  
8  
9 England, 2017.  
10 32 Baqir W, Paes P, Stoker A, *et al*. Impact of an integrated pharmacy service on  
11  
12 hospital admission costs. *Clinical Pharmacist* 2018;**10**(5) **online**  
13  
14 doi:10.1211/CP.2018.20204550 (accessed June 2019)  
15  
16 33 Robinson J. Majority of community pharmacists do not access the SCR in a  
17  
18 typical week, analysis shows. *Pharm J* [25<sup>th</sup> October], 2018; **online**.  
19  
20 doi:10.1211/PJ.2018.20205645 (accessed June 2019)  
21  
22 34 NHS England. *NHS England - Pharmacy Integration Fund*. [Internet] 2019.  
23  
24 [https://www.england.nhs.uk/primary-care/pharmacy/pharmacy-integration-](https://www.england.nhs.uk/primary-care/pharmacy/pharmacy-integration-fund/)  
25  
26 [fund/](https://www.england.nhs.uk/primary-care/pharmacy/pharmacy-integration-fund/) (accessed June 2019).  
27  
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Peer review only

# BMJ Open

## How timely is access to palliative care medicines in the community? A mixed methods study in a UK city

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2019-029016.R2
Article Type:	Original research
Date Submitted by the Author:	10-Sep-2019
Complete List of Authors:	Miller, Elizabeth; Sheffield Teaching Hospitals NHS Foundation Trust, Pharmacy Morgan, Julie; University of Bradford Faculty of Life Sciences, School of Pharmacy and Medical Sciences Blenkinsopp, Alison ; University of Bradford Faculty of Life Sciences, School of Pharmacy and Medical Sciences
<b>Primary Subject Heading</b>:	Palliative care
Secondary Subject Heading:	General practice / Family practice, Health services research, Health policy
Keywords:	PALLIATIVE CARE, community pharmacy services, pharmacists, prescriptions, interprofessional issues

SCHOLARONE™  
Manuscripts

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4 **Title: How timely is access to palliative care medicines in the community? A**  
5 **mixed methods study in a UK city**  
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15  
16 **ABSTRACT**  
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18 **Objective:** To investigate timely access to palliative medicines/drugs (PMs) from  
19 community pharmacies to inform palliative care service delivery.  
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22 **Design:** Mixed methods in two sequential phases: 1. Prospective audit of  
23 prescriptions and concurrent survey of patients/representatives collecting PMs from  
24 pharmacy; 2. Interviews with community pharmacists (CPs) and other healthcare  
25 professionals (HCPs).  
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29 **Setting:** Five community pharmacies in Sheffield, UK and healthcare professionals  
30 that deliver palliative care in that community.  
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33 **Participants:** Phase 1: Five CPs: two providing access to PMs within a locally  
34 commissioned service (LCS) and three not in the LCS; 55 patients/representatives  
35 who completed the survey when accessing PMs; Phase 2: 16 HCPs, including five  
36 Phase 1 CPs, were interviewed.  
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40 **Results:** The prescription audit collected information on 75 prescriptions (75  
41 patients) with 271 individual PMs; 55 patients/representatives (73%) completed the  
42 survey. Patients/representatives reported 73% of PMs were needed urgently. In 80%  
43 of cases patients/representatives received all PMs on the first pharmacy visit. One in  
44 five had to travel to more than one pharmacy to access PMs. The range of PMs  
45 stocked by pharmacies was the key facilitating factor. CPs reported practical issues  
46 causing difficulty keeping PMs in stock and playing a reactive role with palliative  
47 prescriptions. Confidentiality concerns were cited by other HCPs who were reluctant  
48 to share key patient information proactively with pharmacy teams. Inadequate  
49 information transfer, lack of CP integration into the care of palliative patients, and  
50 poor HCP knowledge of which pharmacies stock PMs meant patients and their  
51 families were not always able to access PMs promptly.  
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4 **Conclusions:** Consistent routine information transfer and integration of pharmacy  
5 teams in the care of palliative patients are needed to achieve timely access to PMs.  
6 Commissioners of PM access schemes should review and monitor access. HCPs  
7 need to be routinely made aware and reminded about the service and its locations.  
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11 **Key Words:** palliative care; community pharmacy services; pharmacists;  
12 prescriptions; interprofessional issues  
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15 **Word Count** 5403  
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## 17 **Article Summary**

### 18 **Strengths and limitations of this study**

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23 This is the first published study to identify the relative impact of factors contributing to  
24 non-timely access to palliative medicines/drugs.  
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27 This paper is the first in the UK to examine perspectives of different healthcare  
28 professionals (HCPs) on factors supporting and hindering access to palliative  
29 medicines/drugs.  
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33 The study is also novel in its examination of customer experience of accessing  
34 palliative medicines/drugs and the survey achieved a high response rate.  
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38 The study is possibly limited by the low number of sites but adds value to the  
39 literature in terms of barriers that need to be considered if more timely access to  
40 palliative medicines/drugs is to be more widely implemented.  
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44 number GA10. The views expressed are those of the author(s) and not necessarily  
45 those of Pharmacy Research UK.  
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## INTRODUCTION

Palliative care is a holistic approach that seeks to improve the quality of life of patients with life-limiting or life-threatening illnesses.[1] Population aging together with an increase in those dying with cancer and non-communicable diseases will increase the need for palliative care at the end-of-life[2] with predictions suggesting end-of-life care provision in the community and care homes needs to double by 2040.[3] Whilst the phrase 'end-of-life' is not precisely defined, it is commonly used in United Kingdom (UK) policy and professional guidance to refer to the final year of life [4]. Nevertheless, for many people, end-of-life care will encompass a much shorter timescale and timely access to medicines for pain and symptom management, which are referred to in this study as palliative medicines/drugs (PMs), will be a crucial aspect of palliative care service delivery.[4]

For most patients in primary care the source of medicines is from their community pharmacy (retail pharmacy or "chemist shop"); however previous research and service audits show access to medicines such as injectable medicines used for symptom control in palliative care towards the end-of-life may not be as timely as patients and their families may need and wish.[5–9] Pharmacies cannot stock every possible PM; local formularies which provide lists of preferred medicines to support symptom management towards the end-of-life help address this in the UK.[7,8] However knowledge on which PMs are listed in the formulary and those pharmacies holding stocks may be lacking among prescribers[7,8] which could lead to prescriptions being issued for 'non-formulary' items not on the local list and/or prescriptions being presented to pharmacies that do not routinely hold PMs.[5–12] Delays may also be caused by legal errors on controlled drug (CD) prescriptions that do not comply with UK government legislation necessitating the pharmacist making professional and ethical judgements in supporting patient care especially in the out-of-hours period.[5,7,8] There is a suggestion that hand-written prescriptions may be particularly problematic due to higher prescription error rate and out-of-hours presentation[7,13,14] and they are still in use in the UK for home visits.[5,7,14]

Australian research on a proposed core set of PMs found that pharmacies stocked on average three out of the list of 12,[11] while a systems analysis in Ireland found that not stocking PMs in the pharmacy was the most likely factor leading to delays[10] and this has also been found in the UK.[5,7,8,12] Reported contributory

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4 factors include: the unpredictable nature of PM prescription requests; national stock  
5 shortages; the prescription of PMs or strengths not on the recommended list;  
6 unlicensed medicines; errors on CD prescriptions and the inability to contact the  
7 prescriber, for instance outside GP (family doctor) practice opening hours.[5,8,14]  
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11 Community pharmacies may take part in local or nationally commissioned services  
12 to support access to PMs in the community. In England, a locally commissioned  
13 service (LCS) can be provided by the local clinical commissioning group (CCG) or a  
14 local enhanced service (LES) can be commissioned by National Health Service  
15 (NHS) England Area Teams in response to public need.[15] Such services differ  
16 across geographical regions and are not commissioned from all pharmacies, causing  
17 confusion for patients and their caregivers who are often involved in prescription  
18 collection and medicines management when a patient's condition deteriorates.[9,16–  
19 18] Furthermore, a lack of monitoring of PM availability against those prescribed both  
20 within the pharmacy and by the commissioning body could mean PMs are not  
21 available when needed. (Aslett, M. and Wall-Hayes, L. 2015. 'Access to palliative  
22 drugs – community pharmacy scheme – audit.' Unpublished NHS audit report,  
23 Birmingham, UK)  
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34 There is little research internationally on community pharmacists' (CPs) involvement  
35 in supporting timely access to PMs. Hence this study seeks to answer the question  
36 'What barriers are encountered by community pharmacists in delivering timely  
37 access to palliative care medicines.' Due to the dearth of published research  
38 particularly in the context of community pharmacy services in England the aim of this  
39 study was to evaluate timely access to PMs in the community pharmacy setting and  
40 make recommendations to inform the commissioning of services and future practice.  
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45 The objectives were to:

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48     ▪ determine the timeliness of access to PMs in the community;
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51     ▪ investigate the prevalence and nature of prescribing errors on prescriptions  
52 for PMs presented to community pharmacies and determine whether errors  
53 impact on access to urgent PMs;
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56     ▪ investigate processes for accessing PMs from pharmacies where a locally  
57 commissioned service (LCS) operates including referrals when PMs are not  
58 available;  
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- explore the views and experiences of CPs and other stakeholders on accessing PMs from community pharmacies.

## METHODS

This study used mixed methods across two sequential phases (See Table 1 for study overview) conducted in Sheffield, UK. Participants in both phases gave informed consent before taking part. Ethical approval was obtained from the University of Bradford.

**Table 1 Overview of study phases**

*Phase 1:*

Audit of palliative prescriptions meeting inclusion criteria in participating pharmacies from May - October 2016

Customer survey for those collecting palliative prescriptions in participating pharmacies from May - October 2016

*Phase 2:*

Semi-structured face-to-face interviews with pharmacists participating in Phase 1 and other healthcare professionals involved in palliative care in the community from September 2016 - March 2017

*Phase 1: Audit of PM supplies over six-month data collection period.* Sheffield pharmacies were recruited through e-bulletin sent by the Local Pharmaceutical Committee (LPC), fax invitation to LCS PM pharmacies (19 of the 128 in the city), and verbal invitation at a local pharmacy practice development event. CPs expressing interest in taking part were given an information leaflet and consent form via email providing further information and the study inclusion criteria. Eligible CPs participated in the LCS or usually dispensed thirty or more PM prescriptions in a month based on NHS Digital prescription data for opioid analgesics and midazolam dispensed in pharmacies in the region.[19] Exclusion criteria were: i) pharmacists who had worked in the UK for less than 12 months (to ensure participants were familiar with UK and local community pharmacy services), and ii) if the company or manager did not give permission for participation. None of the interested pharmacies had to be excluded based on these criteria.



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3 A pragmatic approach to sample size was taken; the intention was to recruit up to 15  
4 pharmacies however only five CPs consented to participate, partly due to the  
5 unexpectedly low level of PM prescriptions reported. Informed consent was obtained.  
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7 EM personally visited each participating pharmacy to brief them on the project, data  
8 collection forms and answer any questions to enhance consistency of data  
9 collection.  
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14 Consenting pharmacies collected data on thirty consecutively presented  
15 prescriptions which contained medicines likely to be prescribed for palliative care  
16 patients using criteria developed by EM. Eligible prescriptions were for adults aged  
17 18 years or over and included one or more of the following: a long acting oral or  
18 transdermal strong opioid co-prescribed with a short acting opioid; fast acting  
19 fentanyl product; prescription of subcutaneous or syringe pump PMs, specified  
20 unlicensed medicines used in palliative care, as well as any prescription issued by  
21 the palliative care team. Prescription data was collected for six months between May  
22 to October 2016. Pharmacy data collection forms were developed by EM and  
23 reviewed by JDM and piloted in one community pharmacy. The form recorded  
24 anonymised prescription data including: names of medications on the prescription;  
25 whether there was a legal or non-legal error on a controlled drug prescription and  
26 further information on how that error was resolved including whether the patient's  
27 summary care record (SCR) was accessed to resolve an error. Legal and non-legal  
28 prescription errors were identified by the CPs and non-legal errors were classified by  
29 EM according to criteria within the PRACTiCe study.[20] Further details on non-legal  
30 errors were completed on a separate form to allow EM to verify the classification.  
31 Previous research suggested that delays may be caused by doctors prescribing  
32 products not on the community pharmacy PM list[7,8] (e.g. midazolam 5mg/5ml  
33 prescribed when midazolam 10mg/2ml on list) hence where prescribers issued  
34 legally correct prescriptions for products not recommended on the LCS PM list these  
35 were classified as non-legal errors. Subcutaneous items in the audit were checked  
36 by EM against the LCS list to identify non-formulary items in both LCS and non-LCS  
37 pharmacies.  
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56 Prescriptions were classified as urgent when i) the survey respondent stated it was  
57 urgent, ii) they included anticipatory subcutaneous medicines and/or PMs to be given  
58 by a syringe pump or iii) they were from an out-of-hours provider. The date/time a  
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3 prescription was received by the pharmacy and the date/time when it was ready for  
4 collection were recorded by pharmacy staff.  
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7 *Survey of patients/representatives collecting PM prescriptions.* The national  
8 pharmacy contracting organisation the Pharmaceutical Services Negotiating  
9 Committee (PSNC) community pharmacy patient questionnaire (CPPQ)[21] was  
10 used as a basis to develop a short customer survey of experiences of patients and  
11 their representatives of collecting PM prescriptions from the community pharmacy.  
12 Questions included the perceived urgency of the prescription, the customer's  
13 previous use of the pharmacy, whether they were the patient or the patient's  
14 representative, whether they were able to access all required PMs, whether they had  
15 been referred to the pharmacy (e.g. by another HCP) and whether they had to visit  
16 more than one pharmacy to access the PMs on the prescription. When  
17 patients/representatives indicated that not all items were available they were given  
18 the option of completing a free text section to explain how they intended to get these  
19 items. A free text section allowed respondents to record their answer to 'are there  
20 any things that could have been improved to make your visit better?' The customer  
21 survey was developed by EM with input from JDM, AB, a hospice service user co-  
22 ordinator and risk manager. It was piloted in one pharmacy, further refined and  
23 piloted with patients within a hospice day centre. Pharmacy teams were provided  
24 with a written briefing on how to introduce the survey to patients/representatives.  
25 Individuals collecting prescriptions for PMs were invited to participate by pharmacy  
26 support staff or the CP depending on the pharmacy. A unique number was used to  
27 match the customer survey to the pharmacy data form to allow verification of the  
28 data and assess any discrepancies. Patients/representatives not attending the  
29 pharmacy, e.g. home deliveries and care home residents, did not complete the  
30 customer survey.  
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49 *Phase 2: Semi-structured interviews with CPs and other HCPs involved in care of*  
50 *palliative patients.* EM conducted interviews with the five CPs participating in phase  
51 1 and with a purposive sample of other HCPs involved in palliative care in the  
52 community including GPs, community specialist palliative care team, community  
53 nurses, district nurses and intermediate care team members. HCPs were invited to  
54 participate via e-bulletin, email and through gatekeepers (practice managers and  
55 team leaders). Interviews were audio-recorded with consent and transcribed  
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3 verbatim by EM. The interviews explored views and experiences of accessing PMs  
4 in the community; factors that supported or hindered access and their knowledge of  
5 the LCS. The interview schedule is available on request from the authors.  
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### 8 9 **Data analysis**

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11 Prescription data were entered into and analysed using IBM SPSS® V.23 statistical  
12 software by EM. Frequencies and percentages were calculated for all categorical  
13 variables with mean and standard deviation calculated for time to process  
14 prescriptions. Crosstabs was used to check relationship between legal or clinical  
15 errors and prescription generation method.  
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19 Interview transcripts were read by EM for content familiarisation then annotated and  
20 coded manually using a priori themes from the study objectives. Following  
21 development of an analytical framework, two over-arching themes were then used to  
22 'chart' the coded data: (1) timely access to PMs, (2) the community pharmacist's role  
23 in palliative care, using the Framework Method.[22] The framework was revised and  
24 iteratively refined with CW and AB against the coded interview transcripts with  
25 emergent themes and subthemes applied across the whole data set. Summaries of  
26 data were added within the framework to capture participants' views. Mapping and  
27 interpretation of findings compared similarities and contrasts between and across  
28 professional groups and was supported through discussion and reflection with AB  
29 and CW.  
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33 Data from both phases were then triangulated where two or more sources agreed or  
34 contrasted with each other to help explain the quantitative results of the study.  
35 Triangulation enhanced the validity and reliability of the results and enabled  
36 integration of the findings, such that it was possible to make recommendations for  
37 practice improvement and identify issues for service commissioners to consider.  
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### 40 41 **Patient Involvement**

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43 The study was informed by research priorities in palliative care[23] and through EM's  
44 professional experience including discussion with patients and carers experiencing  
45 medicines access problems following admission to a hospice. The customer survey  
46 tool was developed and piloted with patients in a hospice setting.  
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## RESULTS

### Participants in each phase of the study

*Phase 1 CP audit:* Participating pharmacies were diverse in that they included pharmacies classified as independent (having fewer than five branches) and multiple (having five or more branches); two provided access to PMs under an LCS and three did not. Pharmacy sites were a combination of high street/local parade of shops (3), and suburban (2) with both suburban pharmacies co-located with a GP practice. For pharmacies not consenting to take part, the main reason cited was small numbers of palliative care prescriptions dispensed in the pharmacy.

*Customer survey:* Customer surveys were completed against 55/75 CP audit forms; response rate 73.3%. Non-completion related primarily to home deliveries and care home prescriptions.

*Phase 2 CP and other HCP Interviews:* 16 individuals participated: CPs (5), GPs (3), Specialist Palliative Care Team (2), Community Nurses (5), and Intermediate Care Team (1). The five CPs were also involved in phase 1. Median interview durations were 51 minutes for CPs and 18.5 minutes for GPs and other HCPs.

### Phase 1: Prescription characteristics

A total of 271 prescription items on 75 prescription forms was recorded (range 2 to 33 per pharmacy, median 14) over the 6-month audit period with a mean number of 3.6 prescription items per form. This included 68.3% ( $n = 185$ ) of PMs identified as urgent, 49.8% ( $n = 135$ ) containing subcutaneously administered PMs and 24.7% ( $n = 67$ ) containing subcutaneously administered CDs. In 91.1% ( $n = 123$ ) of cases, subcutaneous items were chosen from the LCS formulary list. Non-formulary choices were either different presentations of formulary items (5.9%,  $n = 8$ ) or items not on the LCS list (3.0%,  $n = 4$ ). Varying strengths of midazolam ampoules accounted for 41.7% ( $n = 5$ ) of non-formulary choices.

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4 Prescriptions were computer-generated ( $n = 245$ , 90.4%) or hand-written ( $n = 22$ ,  
5 8.1%), with no prescriptions delivered electronically via the electronic prescription  
6 service (EPS); missing data ( $n = 4$ , 1.5%). Most prescriptions were written by NHS  
7 GPs providing in-hours services ( $n = 233$ , 86%), with out-of-hours GPs ( $n = 33$ ,  
8 12.2%) or specialist palliative care team ( $n = 5$ , 1.8%) writing the remainder. There  
9 were no non-medical prescriber prescriptions within the sample. Prescriptions were  
10 presented to the pharmacy during GP opening hours (from 9-6pm Monday to Friday)  
11 ( $n = 176$ , 64.9%) or outside GP hours (evenings and weekends) ( $n = 77$ , 28.4%);  
12 missing data on 6.6% of forms ( $n = 18$ ).  
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### 20 **Phase 1: Prescription audit**

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22 Legal errors were present in 1.1% ( $n = 3$ ) of prescription items; all of which were  
23 computer-generated, not specifying a dose on a CD given via infusion. There were  
24 no legal errors on handwritten prescriptions. There was insufficient evidence of a  
25 difference between prescription generation method and legal errors (Fisher's Exact  
26 2-sided test,  $p = 0.052$ ). Other non-legal prescribing errors such as incomplete  
27 information, dose/ strength error, generic/ brand error, allergy, and quantity error  
28 occurred in 3.0% ( $n = 8$ ) of items. Table 2 summarises prevalence of different  
29 medication problems on prescriptions and table 3 indicates types of prescribing  
30 errors using categories as in the PRACTiCe study.[20]  
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**Table 2: Prevalence of medication problems**

Type of medication problem	Frequency of problem	Total number of prescription items	Percentage prevalence
Legal errors	3	271	1.1%
Prescribing errors (see table 3)	8	271	3.0%
Out of stock with supplier	1	271	0.4%
Non-formulary LCS item requested	12	135	8.9%

**Table 3: Prescribing errors (n=271)**

Type of prescribing error	Frequency	Percentage prevalence
Incomplete information on prescription	2	0.7%
Dose / strength error	2	0.7%
Generic / brand error	2	0.7%
Allergy <sup>1</sup>	1	0.4%
Quantity error	1	0.4%

<sup>1</sup> Allergy ascertained from patient or patient's medical record on pharmacy dispensing system

### Phase 1: Time to access urgent palliative care medicines

Valid time data was available for 57.8% ( $n = 107$ ) of 185 urgent items ( $n = 73$  missing data;  $n = 5$  excluded where PMs unavailable and prescription taken elsewhere and recorded as 0 minutes). Median time to process urgent PMs (time of prescription receipt to time of complete supply of PMs) was 2 hours (10 minutes in LCS pharmacies and 5 hours in non-LCS pharmacies). The maximum time to process urgent PMs was 3 hours and 39 minutes within LCS pharmacies, and 47 hours and 15 minutes within non-LCS pharmacies (see figure 1).

The median time taken to access urgent medications ( $n = 107$ ) between pharmacies participating in the LCS and pharmacies not participating in the service was significantly different (independent samples median test  $p = 0.002$  at 95% confidence level); with pharmacies not participating in the LCS taking significantly longer than pharmacies in the LCS.

**Figure 1: Time taken to access urgent palliative medicines from community pharmacies** (see separate file)

Legal errors had minimal effect on access as all urgent PMs with legal errors were available within 30 minutes of presentation. Legal errors were resolved by: contacting the nursing home to specify the dose to be given on a prescription for PMs via a syringe pump using a community medicines administration record, using the pharmacy patient medication record to access information on a previously issued prescription, and contacting the prescriber. The patient's summary care record (SCR) was not used to resolve errors in the prescription audit sample.

### Phase 1: Customer Survey

Survey responses showed that representatives collected PMs on behalf of the patient (65.5%); for both themselves and the patient (1.8%); and patients collected their own PMs (32.7%); 72.9% of surveys overall indicating the prescription included urgent item(s). All cases for urgent subcutaneous medications were collected by a representative on behalf of a patient. In 42.6% of cases the patient attended their usual pharmacy. Patients/representatives also indicated the pharmacy was:

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4 convenient (14.8%); one of several pharmacies used (20.4%), or that they had been  
5 referred to the pharmacy for the medications (21.8%).  
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8 In 80% of cases patients/representatives received all medications against the  
9 prescription at the first pharmacy they visited. In 20% (11/55) one or more items on  
10 the prescription was not available, in five of these the item(s) were urgent. Free text  
11 sections were completed for six of the 11 cases of unavailable items. Four indicated  
12 they would return to collect the item from the pharmacy and two said they would try  
13 another pharmacy to obtain the items.  
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19 Thirteen respondents made additional comments on whether their experience could  
20 have been better. Comments were mostly positive: six indicated 'no', 'none', 'no fine'  
21 or similar phrase; five made comments on the staff or service: 'friendly services  
22 under difficult circumstances', 'no - staff really friendly and helpful, service was quick  
23 and efficient', 'Nothing – excellent and quick service'; and one explained 'nothing  
24 much that would make it better, but I phone in advance to make sure my items are in  
25 stock'. One respondent requested to 'keep a stock of all required items'.  
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31 Overall one in five patients/representatives had to go to more than one pharmacy to  
32 get urgently needed PMs, increasing to one in three for urgent subcutaneous  
33 injection prescription items. One in every two patients/representatives referred to the  
34 pharmacy by another HCP had to go to more than one pharmacy. Data from the  
35 prescription audit and customer survey were triangulated to verify the validity of the  
36 information in phase 1.  
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## 42 **Phase 2: Interview findings**

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44 Findings from the interviews are presented in four sections: timely access;  
45 challenges; knowledge of LCS; and communication and collaboration. The findings  
46 are illustrated by verbatim quotes from the interviews where appropriate.  
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### 51 **Timely access**

52 Anticipating need and forward planning were key themes to ensure timely access to  
53 PMs.  
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57 *... I could go in now and say, 'I need these drugs' (and the CP might say) 'Oh*  
58 *I can get them in for 11 o'clock tomorrow morning' [exasperated laugh] it's like*  
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3 *that's not really very helpful, I need them now* (HCP7, Community Healthcare  
4 Professional)  
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8 Community nurses and palliative care team staff reported strategies to enhance  
9 access including conducting an end of week check and balance for those on syringe  
10 pumps to ensure sufficient stock for over the weekend when fewer staff were  
11 available. Specialist palliative care team staff also described making do with the  
12 medicines already available in the house and then ordering medication for the next  
13 day. CPs perceived that patients/HCPs phoning ahead for large quantities would be  
14 helpful. Insufficient quantities of PMs could adversely impact patient symptom  
15 management and had consequences for staff resources, however not all situations  
16 could be taken into consideration.  
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23 *... a GP won't prescribe a syringe driver ahead of time...we are*  
24 *always...having to do it now not in a more considered way* (HCP4,  
25 Community Healthcare Professional)  
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29 *... I remember having to go [to the pharmacy] in the middle of doing a*  
30 *[syringe] driver because there weren't enough drugs* (HCP8, Community  
31 Healthcare Professional)  
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36 The local clinical commissioning group (CCG) had implemented a template on the  
37 GP prescribing system to provide a 'suite' of PMs according to local last days of life  
38 algorithms which included some of the injectable medicines listed on the LCS  
39 formulary. Even so, in phase 1 several 'non-formulary' medications not on the local  
40 CCG PM list were prescribed and in phase 2 CPs in LCS pharmacies described non-  
41 compliance with the local formulary as a reason for a lack of timely access to PMs.  
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47 *We've got three different strengths of oxycodone injection, and they [GPs]*  
48 *prescribe all three, and you might not have one, you might have the*  
49 *other...it's just so frustrating...* (P4, Community Pharmacist)  
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52 *The big problem is midazolam...so many strengths...volumes of*  
53 *ampoules...the GPs just pick one.* (P5, Community Pharmacist)  
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## Challenges

CPs described practical issues in supplying PMs for example: stock ordering processes including: timing of deliveries and the inability to return CD items to suppliers due to legal restrictions; CD cabinet size (to meet UK legal requirements for storage); and quantities on prescriptions.

*We don't have an ability to be able to keep a lot [controlled drugs] and so we have a particular issue with the quantities that they write on the prescriptions sometimes which can impact on the next patient (P4, Community Pharmacist)*

*We've only got very small CD cabinets...the more controlled drugs you keep the more issues you are going to have (P1, Community Pharmacist)*

Furthermore, patient records and charts to check opioid dose changes and syringe pumps were often not accessible to CPs.

*With regards to changing doses or monitoring, I think that would be difficult for a community pharmacist. We have the summary care [record]... with palliative care the dose can change, you've got the pink card...sometimes we see [the pink card] and sometimes we don't (P2, Community Pharmacist)*

*... they [CPs] don't get the pink card [syringe pump chart] they simply get the prescription (HCP3, GP)*

*I might only need...extra diamorphine...whereas I might be using midazolam and haloperidol...but I've still got a supply of those, so they [CPs] don't always know what's in the [syringe] driver (HCP4, Community Healthcare Professional)*

## Knowledge of LCS

HCPs had little knowledge of either the LCS or the pharmacies commissioned to provide it but knew which pharmacies were likely to keep some PMs in stock.

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3  
4 *I don't know who's commissioned we just basically know which ones we go to*  
5 *that are more likely to have it. (HCP4, Community Healthcare Professional)*  
6

7  
8 *... relatives who are running right left and centre trying to get hold of these*  
9 *meds...there is a commissioned service...but we don't know who they are.*  
10  
11 *(HCP1, Community Healthcare Professional)*  
12

13  
14 GPs generally thought that all pharmacies kept some injectable PMs in stock but  
15 said they might ring in advance to check the medication was available if a supply  
16 was needed urgently. Non-LCS pharmacist providers knew of the service and how to  
17 refer a patient/carer if they did not have the requested medication available. Usually  
18 they would phone ahead to the pharmacy to check the medication was available  
19 before making a referral. Being able to make a referral depended on whether the  
20 carer had access to a car.  
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26 *... if they haven't got a car it's sometimes a bit tricky (P1, Community*  
27 *Pharmacist)*  
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### 30 31 **Communication and Collaboration**

32  
33 Participants described strategies to enhance access to PMs. Two non-LCS  
34 pharmacies had worked with GP practices to discuss and agree to stock a subset of  
35 the LCS PMs; they had similar response times to pharmacies in the LCS.  
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38  
39 *... we went to them [GPs] and said, what are the most common drugs*  
40 *you would prescribe in palliative care...they [GPs] came back with a*  
41 *list...so we would try to keep the stock in for what they specified (P3,*  
42 *Community Pharmacist)*  
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46  
47 CPs reported that some patients/carers contacted the pharmacy when they ordered  
48 a prescription for a CD that might not be stocked. Community and specialist palliative  
49 care team staff described how they would suggest the pharmacist kept sufficient  
50 stock when they had someone on a syringe pump or large quantities of injectable  
51 medications. There appeared to be some examples where excellent communication  
52 and collaboration existed between GPs, HCPs and CPs which resulted in more  
53 timely access for PMs.  
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3 ... one GP...rang us and said well what have you got in stock and what  
4 can you get, which I found really, really useful because as the  
5 prescription came in the stock came in and this thing was completely  
6 seamless (P3, Community Pharmacist)  
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11 When we were down at [previous community nurse location] ...there was  
12 a pharmacy next door so...if we had any quick questions, we would go  
13 and talk to them...they were more like part of the team (HCP7,  
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15  
16 Community Healthcare Professional)  
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19 However, concerns around patient confidentiality by GPs and other HCPs meant that  
20 more often this information was not shared with the pharmacy team in advance of  
21 receiving the prescription.  
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24  
25 ... but you're limited by what you can tell them [pharmacists] obviously  
26 from a confidentiality point of view... (HCP11, Community Healthcare  
27  
28 Professional)  
29

30  
31 We don't communicate with them [community pharmacist] what the problem  
32 with the patient is we just prescribe the drugs... sometimes they can obviously  
33 work it out. (HCP3, GP)  
34  
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36  
37 I do have some slight reservations about them [pharmacists] knowing all  
38 those ins and outs...I'm not sure how wide that circle is in there  
39 [pharmacy]...I'd prefer it ...on just a case by case basis...to an identified  
40  
41  
42 clinician... (HCP10, GP)  
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## 46 47 **DISCUSSION**

48  
49 The sequential use of mixed methods to firstly quantify the "problem" and then  
50 qualitative methods to provide context to the barriers to timely supply of PMs  
51 generated new insights into a longstanding problem. Timeliness of access was found  
52 to primarily relate to a mismatch between medicines stocks held by CPs and the  
53 PMs that GPs prescribed. Legal errors on CD prescriptions played a much smaller  
54 role and had little impact on access to PMs in this study. Stock availability as a  
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4 significant factor to support timely access has also been seen in previous  
5 studies.[5,8,10,11]  
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8 Study results appear to indicate a low prevalence of legal errors on palliative care  
9 prescriptions considering 42% of prescriptions were for CDs. Previous studies  
10 suggest legal errors on prescriptions can range from less than 1% up to  
11 approximately 1.9% [14,20,24–28] though data does not specifically focus on  
12 palliative care prescriptions. Legal errors in the current study arose on computer-  
13 generated prescriptions for controlled drugs administered by a syringe pump. The  
14 primary care organisation prescribing template for PMs may have impacted  
15 positively, minimising the number of legal errors.  
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22 Our findings of differential time to access PMs between community pharmacies  
23 participating in the LCS for PMs and non-participants, indicates that a local service  
24 can enhance access. Those pharmacies working with local GP practices to keep a  
25 small agreed range of PMs in stock had similar access times to those within the  
26 LCS, suggesting that such collaboration can also support more timely access and  
27 improve patient and carer experience. Such wider collaboration has been advocated  
28 within national policy drivers and enables greater integration of pharmacy teams in  
29 improving patient care.[29-32] Some HCPs considered CPs “part of the team” but  
30 others saw them only in their “supply” role. Together with concerns about  
31 confidentiality this prevented many HCPs from communicating with CPs about  
32 available stock or giving advance warning to allow stock to be obtained in a more  
33 timely way. A particular concern seemed to be who else, in addition to the  
34 pharmacist, might have access to sensitive information. Commissioners could  
35 remind primary care staff of community pharmacy ethical and information  
36 governance practices to correct any misunderstandings. They could also encourage  
37 HCPs to be proactive in checking stock availability with the patient’s usual pharmacy.  
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50 Palliative patients often rely on family members and friends to support them with  
51 managing their medication especially towards the end-of-life.[9,16-18] Our findings  
52 show that some families obtain urgently required medicines from a pharmacy  
53 different than the one that usually supplied the patient’s medicines. It is unclear what  
54 effect these changes in continuity of care between pharmacies might have towards  
55 the end-of-life, but this study shows that some CPs enhance access by calling other  
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4 pharmacies to ascertain they have PMs in stock. A potential solution could be  
5 through CPs having read and write access to the summary care record (SCR)  
6 allowing them, whether they are the patient's regular, out-of-hours or LCS pharmacy,  
7 to record patient care scenarios to ensure safe, continuity of care of PMs. Variable  
8 accessibility and difficulties in use of SCR by CPs[33] may suggest wider access to  
9 patient records is required.  
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14 One in five patients/representatives accessing PMs had to go to more than one  
15 pharmacy. This is the first study to quantify the number of patients/representatives  
16 who had to do so, with associated inconvenience, wasted time and stress. This  
17 finding could be explained by a lack of awareness of the LCS since this is not  
18 advertised to the public and there was also low awareness amongst HCPs and GPs  
19 in the interviews. Monitoring of LCS/LES services by commissioners may not always  
20 be effective. One audit found only one of nineteen pharmacies held all PMs on the  
21 formulary list and some CPs were not aware that the scheme was active. (Aslett, M.  
22 and Wall-Hayes, L. 2015. 'Access to palliative drugs – community pharmacy scheme  
23 – audit.' Unpublished NHS audit report, Birmingham, UK) There was also evidence  
24 in phase 1 of prescriptions being written for items not on the LCS list which would not  
25 usually be stocked in the pharmacies. Commissioners' service audits could  
26 investigate referral patterns from pharmacies not within the LCS, furthermore  
27 monitoring of LCS pharmacies may improve practice and caregivers' experience.  
28 Commissioners could also act to improve awareness of LCS among local HCPs.  
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43 Some limitations affect the interpretation/generalisability of the findings of this study.  
44 The small sample of participating pharmacies, missing data, reliance on CPs to  
45 identify prescriptions and confounding factors such as time of day, number and type  
46 of staff working in the pharmacy may limit interpretation of the results and introduce  
47 a degree of bias. Differences in the commissioning of access to PMs within England  
48 also may limit the findings as there is no standard service specification stating the  
49 outcomes to be measured. Furthermore, the geographical restriction with data only  
50 collected in one city could limit application to other areas including those in remote  
51 locations, with different out-of-hours providers, and access to palliative care support  
52 in the community. Nevertheless, the study adds value to the literature in terms of  
53 barriers that need to be considered if more timely access to PMs is to be more  
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widely implemented and the methodology has enabled new insights into factors contributing to timely access.

## CONCLUSION

The findings of this study suggest that legal prescribing errors may now have a smaller impact on access to urgent PMs from community pharmacies compared to mismatches between stock availability and PMs prescribed. Both participation in a LCS or collaboration with local prescribers are likely to improve access to PMs.

### Recommendations for future commissioning and practice:

Commissioners should:

- i) encourage GP practices to work with local pharmacies to keep a small range of PMs available
- ii) remind HCPs of the ethical and information governance requirements of community pharmacies and encourage early contact to check stock availability
- iii) involve patients and the public in designing audits of LCS.

Community pharmacies should improve their communication with HCPs around pharmacy opening times and cut-off times for same-day delivery of medicines.

Moving forward, NHS England will be supporting development and integration of CP services into primary care through its Pharmacy Integration Fund[34] and this may also improve interprofessional communication and access to PMs.

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Parts of this study have been previously presented at conferences and published as conference abstracts.

## Author Contributions

EM implemented the study, designed and piloted data collection tools, monitored data collection, wrote the analysis plan, analysed the data, wrote and piloted interview schedule, transcribed interviews, developed the thematic framework and drafted and revised the manuscript. JDM and AB supervised EM in planning and undertaking the study including study design, development of data collection tools, data analysis, drafting and revision of the manuscript.

## Competing interests

EM received research funding from Pharmacy Research UK and Sheffield Teaching Hospitals NHS Foundation Trust as well as support from St Luke's Hospice, Sheffield; JDM and AB are employees of University of Bradford, all these organisations might have an interest in the submitted work – in the previous three years. EM is Treasurer of the Association of Supportive and Palliative Care Pharmacy. AB and JDM report grants from Pharmacy Research UK during the conduct of the study. EM, JDM, and AB are all pharmacists registered with the General Pharmaceutical Council.



### **Ethics approval**

Ethical approval obtained 17<sup>th</sup> December 2015 from the Chair of the Biomedical, Natural, Physical and Health Sciences Ethics Panel, University of Bradford (approval reference E493).

### **Data sharing statement**

Protocol and data collection forms are available upon request from the corresponding author.

### **Patient Involvement**

The design of the study was based on EM's experience as a clinical pharmacist including discussions with patients and their families on accessing medicines. The research question was therefore derived from patients' and family carers' experience on accessing medicines towards the end-of-life. A Hospice Service User Co-ordinator provided support with the customer survey based on their experience of conducting surveys. Furthermore, patients within a hospice day centre supported the piloting of the customer survey.

## References

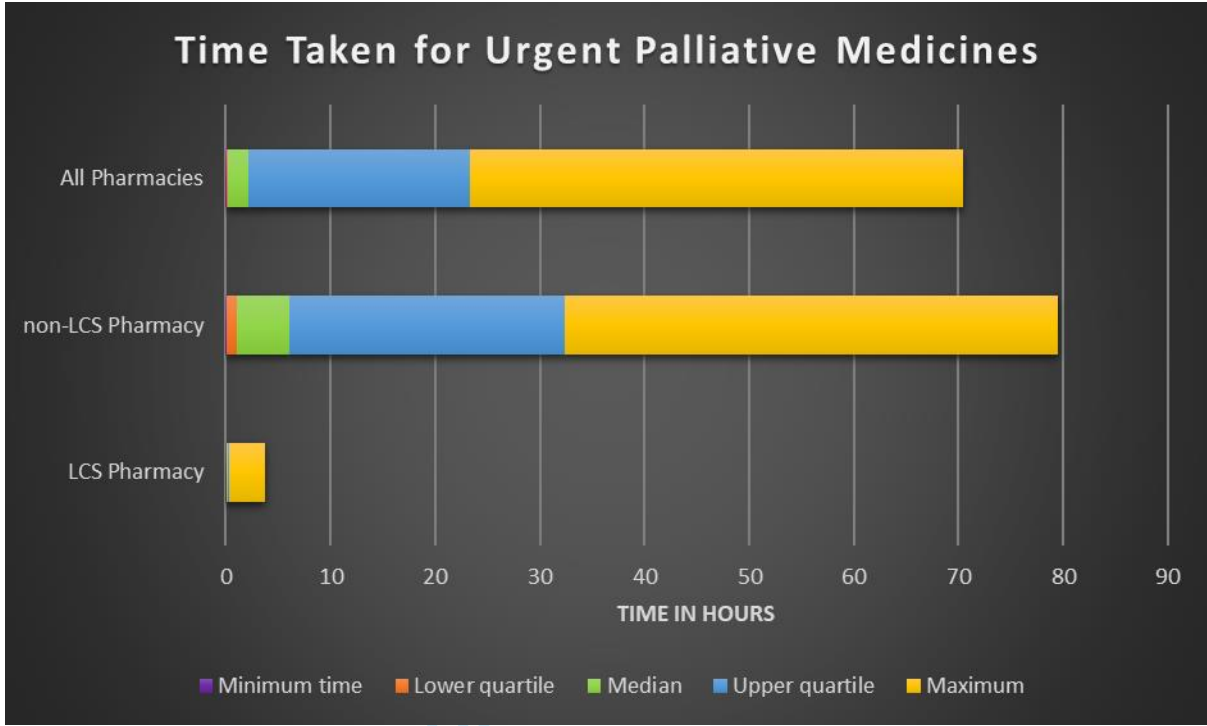
- 1 World Health Organisation (WHO) WHO Definition of Palliative Care. WHO (2012) <http://www.who.int/cancer/palliative/definition/en/> (accessed Sept 2019)
- 2 The World Hospice Palliative Care Association. WHO Global Atlas on Palliative Care At the End of Life. <http://www.thewhpc.org/resources/global-atlas-on-end-of-life-care> (accessed Sept 2019).
- 3 Bone AE, Gomes B, Etkind SN, *et al.* What is the impact of population ageing on the future provision of end-of-life care ? Population-based projections of place of death. *Palliat Med* 2018;**32**:329-36. doi:10.1177/0269216317734435
- 4 National Institute for Health and Care Excellence (NICE) - *End of life care for adults Quality Standard (QS13)*. London: NICE, 2017.
- 5 Bennie M, Hudson S, Akram G, *et al.* *Macmillan Pharmacist Facilitator Project Six Month Baseline Report – 2010*. Glasgow: University of Strathclyde, 2010. <https://www.palliativecareggc.org.uk/wp-content/uploads/2013/10/Macmillan-Report-FINAL-04-11-2010sh2MB-2.pdf> (accessed Sept 2019)
- 6 Miller E, Morgan JD, Blenkinsopp A, *et al.* Are subcutaneous palliative medicines available and accessible: an out of hours (OOH) audit in Sheffield: Abstract 61 Table 1. *BMJ Support Palliat Care* 2016;**6**:407. doi:10.1136/bmjspcare-2016-001204.60
- 7 Savage I, Blenkinsopp A, Closs SJ, *et al.* 'Like doing a jigsaw with half the parts missing': Community pharmacists and the management of cancer pain in the community. *Int J Pharm Pract* 2013;**21**:151–60. doi:10.1111/j.2042-7174.2012.00245.x
- 8 Akram G, Bennie M, McKellar S, *et al.* Effective delivery of pharmaceutical palliative care: challenges in the community pharmacy setting. *J Palliat Med* 2012;**15**(3):317-21. doi:10.1089/jpm.2011.0262
- 9 Sheehy-Skeffington B, McLean S, Bramwell M. Caregivers experiences of managing medications for palliative care patients at the end of life: a qualitative study. *Am J Hosp Palliat Care* 2014;**31**(2):148-154. doi:10.1177/1049909113482514
- 10 Lucey M, McQuillan R, MacCallion A, *et al.* Access to medications in the community by patients in a palliative setting. A systems analysis. *Palliat Med* 2008;**22**(2):185–9. doi:10.1177/0269216307085722

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- 11 Tait P, Gray J, Hakendorf P, *et al.* Community pharmacists: a forgotten resource for palliative care. *BMJ Support Palliat Care* 2013;**3**:436–43. doi:10.1136/bmjspcare-2012-000440
- 12 Faull C, Windridge K, Ockleford E, *et al.* Anticipatory prescribing in terminal care at home: what challenges do community health professionals encounter? *BMJ Support Palliat Care* 2013;**3**:91–7. doi:10.1136/bmjspcare-2012-000193
- 13 MacRobbie A, Bennie M, Akram G, *et al.* *Macmillan Rural Palliative Care Pharmacist Practitioner Project Mapping of the Current Service & Quality Improvement Plan*. Glasgow: University of Strathclyde, 2013. <https://www.nhshighland.scot.nhs.uk/Services/Documents/Palliative%20pharmacy%20project%202016/Macmillan%20RPCPP%20Project%20EXEC%20SUMMARY%2027112013.pdf> (accessed Sept 2019)
- 14 MacRobbie A, Harrington G, Bennie M, *et al.* *Macmillan Rural Palliative Care Pharmacist Practitioner Project Phase 2 Report*. Glasgow: University of Strathclyde, 2015. [https://www.nhshighland.scot.nhs.uk/Services/Documents/Palliative pharmacy project 2016/MRPP Phase 2 Full Report 2015.pdf](https://www.nhshighland.scot.nhs.uk/Services/Documents/Palliative%20pharmacy%20project%202016/MRPP%20Phase%202%20Full%20Report%202015.pdf) (accessed Sept 2019)
- 15 Pharmaceutical Services Negotiating Committee (PSNC). *Locally Commissioned Services*. PSNC, 2019. <https://psnc.org.uk/services-commissioning/locally-commissioned-services/> (accessed Sept 2019).
- 16 Todd A, Holmes H, Pearson S, *et al.* 'I don't think I'd be frightened if the statins went': a phenomenological qualitative study exploring medicines use in palliative care patients, carers and healthcare professionals. *BMC Palliat Care* 2016;**15**:13. doi:10.1186/s12904-016-0086-7
- 17 Joyce BT, Berman R, Lau DT. Formal and informal support of family caregivers managing medications for patients who receive end-of-life care at home: A cross-sectional survey of caregivers. *Palliat Med* 2014;**28**:1146–55. doi:10.1177/0269216314535963
- 18 Payne S, Turner M, Seamark D, *et al.* Managing end of life medications at home - accounts of bereaved family carers: a qualitative interview study. *BMJ Support Palliat Care* 2015;**5**:181–8. doi:10.1136/bmjspcare-2014-000658
- 19 Prescribing and Medicine Team, NHS Digital. *Prescriptions Dispensed in the Community - Statistics for England 2007-2017*. Leeds: NHS Digital, 2018;:1–86. <https://digital.nhs.uk/data-and->

- information/publications/statistical/prescriptions-dispensed-in-the-community/prescriptions-dispensed-in-the-community-england---2007---2017 (accessed Sept 2019)
- 20 Avery T, Barber N, Ghaleb B, *et al.* *Investigating the prevalence and causes of prescribing errors in general practice: The PRACTiCe Study (PRevalence And Causes of prescribing errors in general practiCe) A report for the General Medical Council (GMC)*. Manchester: GMC 2012;:1–187. doi:10.1.1.680.8379
- 21 Pharmaceutical Services Negotiating Committee (PSNC). *Community Pharmacy Patient Questionnaire (CPPQ)*: PSNC,. 2019 <https://psnc.org.uk/contract-it/essential-service-clinical-governance/cppq/> (accessed Sept 2019).
- 22 Gale NK, Heath G, Cameron E, *et al.* Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Med Res Methodol* 2013;**13**:117. doi:10.1186/1471-2288-13-117
- 23 Palliative and end of life care Priority Setting Partnership (PeolcPSP). *Putting patients, carers and clinicians at the heart of palliative and end of life care research*. PeolcPSP, 2015. [https://palliativecarepsp.files.wordpress.com/2018/08/a812\\_jameslind\\_report.pdf](https://palliativecarepsp.files.wordpress.com/2018/08/a812_jameslind_report.pdf) (accessed Sept 2019).
- 24 Quinlan P, Ashcroft DM, Blenkinsopp A. Medication errors: a baseline survey of dispensing errors reported in community pharmacies. *Int J Pharm Pract* 2011;**10**:R68–R68. doi:10.1111/j.2042-7174.2002.tb00673.x
- 25 Sayers YM, Armstrong P, Hanley K. Prescribing errors in general practice: A prospective study. *Eur J Gen Pract* 2009;**15**:81–3. doi:10.1080/13814780802705984
- 26 Hawksworth GM, Corlett AJ, Wright DJ, *et al.* Clinical pharmacy interventions by community pharmacists during the dispensing process. *Br J Clin Pharmacol* 1999;**47**:695–700. doi:10.1046/j.1365-2125.1999.00964.x
- 27 Chen Y-F, Neil KE, Avery AJ, *et al.* Prescribing errors and other problems reported by community pharmacists. *Ther Clin Risk Manag* 2005;**1**(4):333–42. <http://www.ncbi.nlm.nih.gov/pubmed/18360575> (accessed Sept 2019).
- 28 Shah SNH, Aslam M, Avery AJ. A survey of prescription errors in general practice. *Pharm J* 2001;**267**(7178):860–2.
- 29 NHS England. *Commissioning person centred end of life care: A toolkit for*

- 1  
2  
3 *health and social care*. London: NHS England, 2016.  
4  
5 30 NHS England. *Five Year Forward View*. London: NHS England, 2014.  
6  
7 31 NHS England. *Next Steps on the NHS Five Year Forward View*. London: NHS  
8  
9 England, 2017.  
10 32 Baqir W, Paes P, Stoker A, *et al*. Impact of an integrated pharmacy service on  
11  
12 hospital admission costs. *Clinical Pharmacist* 2018;**10**(5) **online**  
13  
14 doi:10.1211/CP.2018.20204550 (accessed Sept 2019)  
15 33 Robinson J. Majority of community pharmacists do not access the SCR in a  
16  
17 typical week, analysis shows. *Pharm J* [25<sup>th</sup> October], 2018; **online**.  
18  
19 doi:10.1211/PJ.2018.20205645 (accessed Sept 2019)  
20 34 NHS England. *NHS England - Pharmacy Integration Fund*. [Intranet] 2019.  
21  
22 [https://www.england.nhs.uk/primary-care/pharmacy/pharmacy-integration-](https://www.england.nhs.uk/primary-care/pharmacy/pharmacy-integration-fund/)  
23  
24 [fund/](https://www.england.nhs.uk/primary-care/pharmacy/pharmacy-integration-fund/) (accessed Sept 2019).  
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