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Impact of a dedicated ward pharmacy service

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Dedicated ward pharmacists make an impact

The dedicated ward pharmacy initiative at Royal Blackburn Hospital in the UK has resulted in falls in readmission rates, savings on medicines, more efficient discharges and improved the patient experience

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Ward pharmacist Sabeela Yasin with other members of the ward team (image courtesy of East Lancashire Hospitals NHS Trust Communications Department)

Putting a pharmacist on a consultant-led ward round is nothing new;[1,2] in fact, many of you reading this article will think, 'Well, we do that'. And there will be many centres where this happens – often at large teaching hospitals and tertiary centres.

The reality for many hospitals is that resources are limited and a pharmacist may be responsible for 'covering' two, three, four or more wards, with or without the support of a pharmacy technician. This is what pharmacy services were like in 2013 in East Lancashire Hospitals NHS Trust (ELHT) before a series of pilots led to the development and roll out of the Dedicated Ward Pharmacy project (DWP). This is the story of how we got there, what we did, what we found out – and of persistence and serendipity.

The B18 model

In 2013, our divisional accountant asked the pharmacy directorate if a pharmacist could improve patient flow if they only had one ward to focus on. We felt we had a good idea of the potential (better medicines reconciliation, better patient engagement and counselling, earlier discharges) and were fortunate to be granted funding to make this a reality for several months. A pharmacist was identified and briefed and the 'B18 model' was instigated – so-called because the pilot took place on our cardiology ward: B18. Additionally, we chose to support the project with a dedicated pharmacy technician.

We found that medicines reconciliation was close to 100% (slightly depressed due to the weekend effect), patient and staff feedback was very positive and most patients were home by lunchtime. It turned out that the pharmacist acted as a catalyst for change – the ward culture shifted; nurses and doctors started working subtly differently. Doctors shifted their hours to start 30 minutes sooner so they could pre-emptively write discharge letters, which were authorised by the pharmacist, dispensed and back with the patient typically within 30 minutes. This meant if patients were told they were fit for discharge during the consultant-led ward round, the nurses could make the necessary arrangements immediately and minor amendments to medicines could be fixed within minutes.

A break in service

A business case was built on the basis of this with the recommendation that the B18 model be replicated on all fast-flow wards. But then, in the summer of 2014, a funding crisis occurred within the National Health Service (NHS) and the project was deemed too expensive to carry forward at that stage.

The concept did not go away and neither did the demand to improve

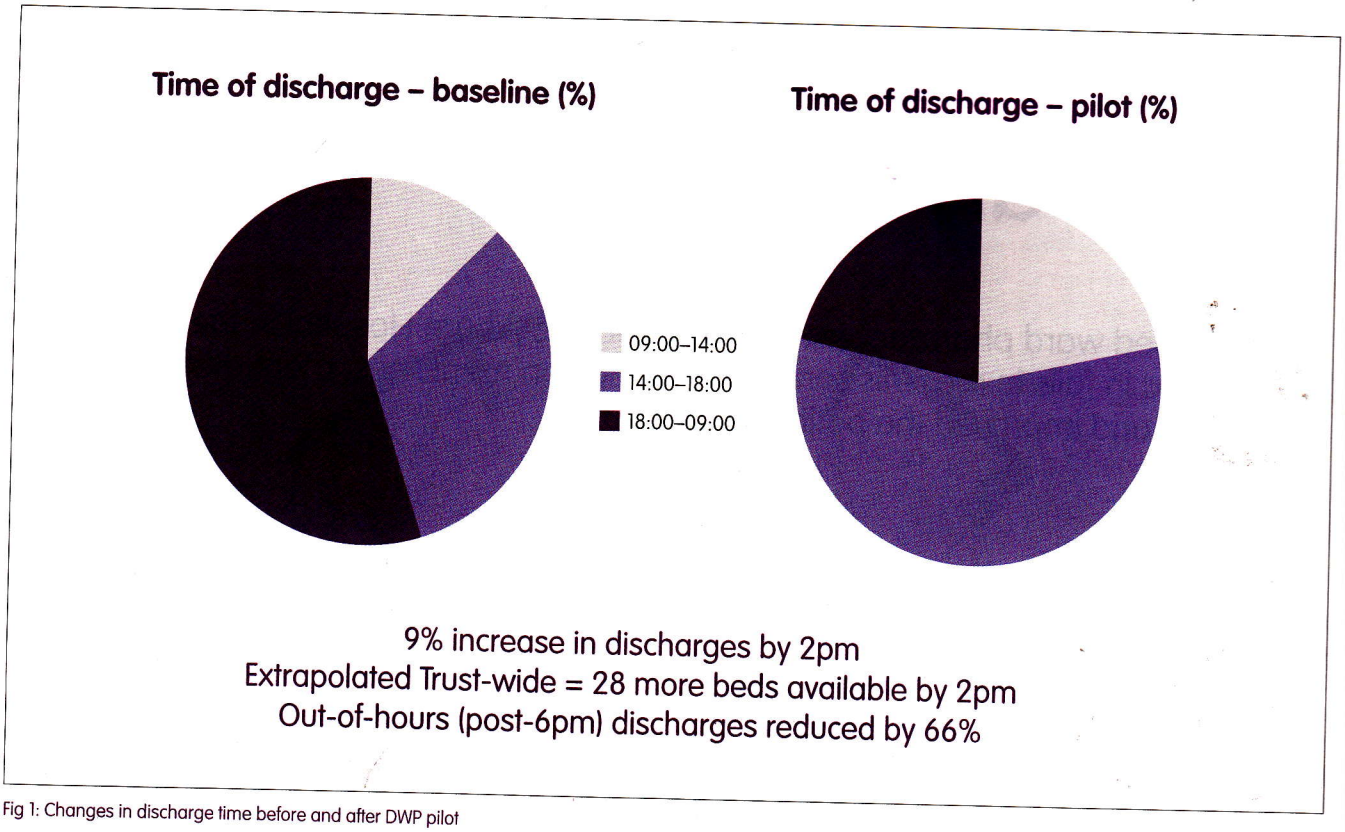

Fig 1: Changes in discharge time before and after DWP pilot

patient flow. The cardiology directorate loved it and wanted it back – predictably, the service had deteriorated once their pharmacist was shared with another ward. Senior managers within the organisation understood this and senior members of the pharmacy team kept talking about the benefits of the 'B18 model'.

In the Spring of 2015, a decision was made to run the pilot again, but this time to do it on a 'regular' ward (not fast-flow) and to see what other outcomes could be measured. With the involvement of the Trust Informatics team we resolved to 'measure everything', and this time put the pharmacist on the consultant-led ward round (this did not occur on B18), and again support the pilot with a dedicated pharmacy technician too.

The C9 model

We chose C9 (a gastroenterology specialty) as the 'regular' ward. A pharmacist and technician were chosen and briefed, and between April and May 2015 they practised pharmacy to the 'nth degree', with the following indicators measured: interventions (nature and value); length of stay (LoS); re-admissions; and medicines reconciliation. In addition, feedback was gathered from patients and ward staff.

The pharmacist prompted the capture of a planned date of discharge (PDD) at each patient-consultant interaction in order to aid discharge planning. This prompted action by many staff to ready patients for discharge, including the pharmacy technician, who made sure that any necessary medicines requiring dispensing were present, and, crucially, completed the medicines sections of the electronic discharge letter (eDL).

Traditionally junior doctors wrote the eDL and transcription inaccuracies frequently occurred.[3] A pharmacy technician is experienced in capturing drug history information (this is what they do for medicines' reconciliation) so they are ideally placed to make this final transcription; and as the pharmacist had been reviewing prescription charts on ward rounds daily, ensuring they were 'clean' of any queries, the technician's task was relatively straightforward. The eDL system in ELHT (Sunquest's ICE) mandates pharmacist authorisation in order to complete a letter, so there is still a check of the transcribed information. And, of course, this saves junior doctor time and lets them focus on completing the clinical summary element of the eDL.

Findings

- LoS was reduced by 4% for patients who stayed in hospital for seven days or longer (which annualised to at least 296 fewer bed days)
- Re-admissions for the same diagnosis at 7, 14 and 28 days were zero (previously having been 40%, 33% and 24%, respectively)
- Medicines reconciliation was performed for 96% of patients (the slight dilution was due to weekend admissions and discharges)
- The value of medicines saved annualised at £15,113 and patients were going home earlier in the day.

"We continually found that patients were getting better, faster and then staying healthy at home"

It was the recorded interventions that explained why there was a reduction in LoS and re-admissions. There were 25 cases of intravenous-to-oral antibiotic switches instigated at the pharmacist's suggestion – these would otherwise have persisted for one or two more days. On numerous occasions, medicines were stopped at the pharmacist's suggestion, as

Pharmacy technician Claire Ryan making an electronic referral to community pharmacy using Refer-to-Pharmacy (image courtesy of East Lancashire Hospitals NHS Trust Communications Department)

they had no clear indication and medicines missed at initial clerking were restarted following early medicines reconciliation. Formulary switches were instigated when patients were admitted on expensive non-formulary medicines. In 22 cases, venous thromboembolism (VTE) assessments had been made, but prophylactic low molecular weight heparin had not been prescribed – in medical patients there is a 17% chance of a hospital-acquired VTE without prophylaxis[4] with an associated cost of five additional days in hospital (for non-fatal VTEs).[5]

The other interesting effect occurred because the pharmacist remained on the ward for the working day after the ward round and therefore gained additional insight into what was happening with each patient. Whereas nurses and doctors worked varying shifts over the weeks, the same pharmacy team was a constant weekday presence; they became unofficial ward co-ordinators.

Putting Pharmacy at the Heart of the Hospital

The findings went into a business case that showed what the safety and financial benefits would be if extrapolated to the whole Trust. The title of the report was *Putting Pharmacy at the Heart of the Hospital* because, as a result of the DWP service, the pharmacy team was becoming the nexus of patient care and flow.

In Autumn 2015, serendipity stepped in with the arrival of a new medical director who understood and supported what had been done and demonstrated. This resulted in funding to recruit two extra pharmacists to run the service on four wards with the hope that outcomes would corroborate previous findings and persuade senior executives to roll out the model Trust-wide.

DWP – pilot phase

Recruitment took place with a plan to pilot four wards from January 2016. The wards identified were: C2 (gastroenterology), C6 and C7 (respiratory wards) and C10 (a multiple specialty ward covering haematology/chemotherapy and rheumatology patients); the cohort had 93 beds in total. Pharmacy and ward staff were identified and briefed. Three of the pharmacists were band 6 and one was an 8a (also involved in leading the project). Each ward had half of a whole-time equivalent technician. The first six weeks' data were analysed and went to produce a business case – with further data included as time passed. We found:

- An observed annualised saving of £67,500 on drug acquisition costs (this extrapolated to £726,000 for the whole Trust – 1000 beds).
- A 65.5% reduction in patients being readmitted with the same diagnosis within 28 days. We believe our Refer-to-Pharmacy scheme, which went live in October 2015, influences this because all eligible patients were referred to their community pharmacist for post-discharge support with their medicines (more information can be found at www.elht.nhs.uk/refer or on the mobile app bit.ly/r2pharm).[6,7]
- LoS was reduced by 2.4 days (this was LoS at midnight) which also equated to 2.4 beds released per ward over the course of a year.
- A 9% increase in discharges by lunchtime (equivalent to 28 patients/day when extrapolated to Trust level) and a 66% reduction in the numbers of patients discharged after 6pm (Figure 1).

There was a weekly average of 185 pharmacy interventions made, including:

- 36 incomplete VTE assessments and prescriptions, and four mismanaged anticoagulated patients
- 29 intravenous-to-oral switches suggested and made
- Chemotherapy adjuvant medication not prescribed including fluconazole,

Table 1. Summary of DWP intervention numbers Sept/Oct 2016

Ward	No. of weeks data	Number of interventions recorded	Average No. of weekly interventions recorded
C10	8	145	18
C2	8	132	17
C6	8	223	28
C7	8	90	11
STU	6	539	90
B18	6	300	50
D1	4	203	51
D3	3	100	33
Total		1732	298

Table 2. Calculated value of pharmacy interventions affecting drug acquisition costs Sept/Oct 2016

Ward	Value	No. of weeks data	Annualised amount
C10	£1896.35	8	£12,326.26
C7	£1233.91	8	£8020.42
C2	£1033.63	8	£67,18.57
C6	£680.10	8	£4420.66
STU	£7447.16	6	£64,542.08
B18	£926.99	6	£8033.90
D1	£237.77	4	£3091.01
D3	£3354.50	3	£58,144.67
Total	£16,810.41	Annualised amount	£165,297.56
		Extrapolated to 33 wards	£681,852.43

co-trimoxazole and aciclovir – this was resolved.

- Aspirin and dalteparin stopped as patient had a subdural bleed; these had been inappropriately restarted when a prescription chart was rewritten
- Hyponatraemia – patient came in on omeprazole – advised switch to ranitidine
- Advised that fludrocortisone and furosemide have opposing effects – furosemide stopped
- Adcal D3 (calcium and vitamin D3) prescribed instead of Adalat LA (nifedipine) – this was resolved
- Holistic review of analgesia for patient with chronic pancreatitis with multiple historic hospital admissions – she has not been readmitted since.

Service questionnaires were completed by patients, doctors and nurses, and all were overwhelmingly positive. Additionally there were many unsolicited comments made; this from a respiratory consultant really getting to the core of what DWP does:

"I would like to thank all of you on the new initiative for Janette (pharmacist) to attend my ward round on C7. I have found this to be very useful in patient management for the following reasons:
1) Drug charts accuracy has improved significantly
2) Discharge planning regarding medication is discussed well in advance
3) Drug interactions and inappropriate medications are highlighted
4) Any drug information is available at bedside during ward round
5) Nurses' and doctors' education
6) Lastly, Janette has become a very important/essential part of the multi-professional team looking after complex needs of patients

I hope this is not a pilot project and will continue in future. I would very much like it to happen on C8 too."

We continually found that patients were getting better, faster and then staying healthy at home. Drug acquisition costs were reduced, patient safety was improved, and both staff and patient experience were improved. Scaling this up across the Trust offered the tantalising prospect of improving patient flow right back to the front door in the ED, and the possibility of requiring fewer hospital beds, or at least reducing the ever-increasing demand on existing (finite) capacity.

A new business case was created that went through various iterations as it progressed through ever-more senior committees until it was eventually given approval to proceed with a couple of caveats. Our desire was to roll the model out to every ward in the Trust and include an enhanced service at weekends, which would mean recruiting 23 extra pharmacists (11 band seven, 12 band six) and 11 extra technicians (5 band five, 6 band four – not every ward needs a dedicated technician) at a total cost of £1.3 million.

The caveats were that recruitment would come in three phases as pump-priming was required to produce the financial benefits that ultimately would make the model self-sustaining. The projected savings when annualised to Trust level were large: £726,000 in drug savings and £540,000 savings due to a 65.5% reduction in patients being readmitted (1060 fewer readmissions). The value placed on the reduction of readmissions was a very conservative estimate. There are many ways this value can be calculated, for example, Lord Carter's report suggests each patient episode costs £3500[8] and this figure would have produced a much greater estimated saving. Similarly, the reduction in LoS will have a financial benefit but proving this in accounting terms is complex.

DWP – phase one

Phase one recruitment took place over the summer of 2016 with an additional eight pharmacists and six technicians joining the organisation, although due to some internal movement and natural turnover all the new positions will not be filled until early 2017. Enough people had completed their induction by October to enable the roll out of DWP to four additional wards: B18 (cardiology), D1 and D3 (endocrinology) and the surgical triage unit (STU). When completed, we will have 15 wards in medicine operating the model plus STU, which previously did not have a pharmacy presence.

New wards have been added stepwise and interventions corroborating the previous findings in terms of safety and fiscal indicators are being observed. A total of 1732 interventions were recorded between September and October (Table 1).

Table 2 shows an extrapolation of drug savings from this period; this is slightly less than the four-ward pilot phase but was attributed the fact that two of the pharmacists involved had not recorded all their interventions, including their successful IV-to-oral switches. This pattern can be seen in both tables and was discovered when retrospectively analysing the data. Pharmacists and technicians have had this feedback, and intervention data gathered in November 2016 now suggests a potential annualised saving of £1,388,705.

Key points

- Dedicated ward pharmacist (DWP)/technician teams have been established on eight acute wards in a district general hospital.
- Drug treatment was optimised and the discharge process was streamlined.
- Length of stay is shorter, readmission rates are lower, and patients are discharged earlier in the day on DWP wards.
- Potential annual savings of more than £1.3 million on medicines are possible
- Subject to continued good results, the scheme will be rolled out to the rest of the hospital in 2017–18.

DWP – phases two and three

The next planned assessment point for the project is March 2017. The outcomes from phase one will be analysed and if these continue to be favourable, will trigger funding for phase two. In this phase, the service will be extended to include surgical wards and remaining medical wards. The effects of phase two will be analysed later in 2017 and hopefully release phase three funding, which will pick up all remaining wards and provide additional resource at weekends.

"Scaling this up across the Trust offered the tantalising prospect of improving patient flow and requiring fewer hospital beds"

The enhancement at the weekend is to support consultant-led ward rounds taking place at that time. We are finding that many of the benefits of DWP result from the pharmacists' presence when prescribing decisions are being made rather than chasing up queries hours or days later. (The prescribing error rate for consultants is reported to be 5.9%).[9] DWP is ensuring the right medicines are being prescribed at effective doses, for the correct duration and timely discharge planning is made possible. The rationale for starting, stopping and changing medicines is captured, supporting effective transfers of care.

Beyond DWP

An unexpected benefit of the recent junior doctors' strike was that our non-medical prescribing pharmacists came to the fore. A prescribing pharmacist worked on one of the DWP wards and undertook much of the routine prescribing during the strike. For the first time, the consultant really saw how a pharmacist can support the MDT with practical prescribing support. Our aim is to increase the numbers of non-medical prescribers we have and take this one step further by giving them advanced practitioner skills so they can be more involved in monitoring and intervening in patient care. Some of this will be through internal training but, increasingly, courses are being offered that deliver these skills.[10] For example, in ELHT, we have the North West region's first ED advanced pharmacist practitioner (follow her on Twitter: @EDpharmpract).

We believe that spreading the model to allow other pharmacy teams and their patients to gain the safety and experiential benefits is important; the spread of innovation within the NHS is traditionally poor. To this end, we have been in contact with the School of Pharmacy at Manchester University and Greater Manchester AHSN to evaluate the research potential of DWP. It is highly likely this will produce a research project examining the data and identifying if DWP improves patient flow without affecting safety. Other Trusts will want robust evidence to support such a 'speculate to accumulate' investment, and we very much hope this research will provide this evidence.

Keep up to date with developments on Twitter – follow @ELHTpharmacist and #DedicatedWardPharmacy. ●

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