

## **Improving patient care during hospital stay through the introduction of an electronic pharmaceutical care plan**

In England each year it is approximated that 237 million medication errors occur during the medication process.<sup>1</sup> When patients transition between primary and secondary care, they are at significant risk of experiencing unintended changes to their medication.<sup>2</sup> One approach to reduce these errors is the adoption of information and communication technology including electronic prescribing.<sup>3</sup>

In September 2017, Bradford Teaching Hospitals NHS Foundation Trust implemented Cerner, an electronic prescribing system, which replaced the traditional paper medical records and chart. Inadvertently, it resulted in a loss of the paper pharmaceutical care plan (PCP), which was used by pharmacy staff as a form of communication to the medical team for drug monitoring and pharmaceutical issues. Pharmacists perceived that their workload had increased since the loss of the PCP, as they had to review the patients' entire medical notes from admission when completing clinical reviews.

A pharmacist led quality improvement project team was established and included 8 pharmacists of differing years of experience, a Cerner specialist, and an academic practitioner. The project aim was to establish a robust proforma and guideline to electronically document a PCP for patients using Cerner and to improve patient care by December 2019. The 'plan-do-study-act' (PDSA) continuous improvement method was chosen as it allowed one to use cycles of iterative change. The main outcome measure was pharmacists' satisfaction with the electronic PCP in relation to improving patient care. Coinciding with this was a reduction in the time taken to review discharge prescriptions post implementation of the electronic PCP.

To investigate the current problem, baseline data was prospectively collected over a 2-week period (Monday - Friday) from pharmacists covering 5 wards. These included the elderly, medical, and surgical specialities. They were specifically chosen to determine if the intervention would work universally prior to a Trust wide roll out. Pharmacists completed **data collection forms** which captured information on the time taken to review a new patient,

a transfer patient with a completed review, and to review a discharge prescription. Pharmacists anonymously completed a satisfaction survey with the current patient handover process.

Baseline data showed that the mean time taken by pharmacists to review new patients was 17.5 minutes versus 12.6 minutes to review a transfer patient. Pharmacists reviewed discharge prescriptions for patients who had been under their care in 13 minutes, versus 15.5 minutes for patients unknown to them.

The mean score was 3/10 at baseline from the pharmacist satisfaction survey. The common themes that emerged from the qualitative data were inconsistencies with the current handover process, and informal documentation of pharmaceutical issues. Pharmacists found it challenging to establish what happened to the patient when they were transferred between wards due to variable documentation. Thus, making the task of clinically reviewing a patient more difficult and time consuming, as it was unclear why medications had been discontinued or initiated.

The **electronic PCP** was produced through 3 PDSA cycles which were undertaken over a 3-week period (November/December 2019). It was based on feedback after each PDSA cycle from the anonymously completed pharmacist satisfaction survey. Pharmacists on the selected wards completed data collection forms as those completed at baseline (Monday to Friday) recording the time taken to complete pharmacist tasks.

Information about the project was disseminated to key stakeholders including Cerner, and the remaining pharmacy team to allow for wider staff engagement. This enabled sustainability and scalability of the project in the future.

Overall improvements in pharmacists' satisfaction with the intervention were observed after each PDSA cycle. The baseline mean score was 3/10 with the handover process, this increased to 8/10 after 3 PDSA cycles. Qualitative data suggested that pharmacists were more satisfied with the new electronic PCP, as it allowed pharmaceutical issues to be documented formally. During the first PDSA cycle pharmacists requested the project team to produce a guideline on

information to be included in the electronic PCP, as well as the process to create the PCP using the Cerner system. This was to improve consistency in documentation.

Quantitative data showed that pharmacists became more efficient in completing tasks after each PDSA cycle. There was a 53.6% reduction in the mean time taken to review a transfer patient. A predictable consequence of the intervention was the increased time taken to complete the electronic PCP. However, the mean time taken reduced from 7.2 minutes after PDSA cycle 1 to 5 minutes after PDSA cycle 2, which could have been a result of user familiarity with the new form. The increase in time was discussed with the project team, as well as reviewing comments made by pharmacists in the satisfaction survey. It was evident that the increase in time was justified, as there was an overall benefit in delivering patient care. Overall, there was strong feedback that the electronic PCP should be rolled out Trust wide.

The project was a success due to the early involvement of key stakeholders in the design of the intervention. Any potential bias created by the Hawthorne effect<sup>4</sup> which may have altered participants behaviour was minimised by anonymising the data collection forms.

A paperless NHS is the future with healthcare professionals having to adapt their working practices due to implementation of electronic prescribing programs. The results showed more pharmacist satisfaction since the adoption of the electronic PCP, with improved patient care and robust pharmacist communication. The overall mean time taken for pharmacists to **undertake daily tasks** reduced since the introduction of the electronic PCP. The next stage of continuous measurement would be to review the number of safety incidents pre and post electronic PCP. This would further demonstrate sustainability and intervention success.

The considerable improvement observed from the intervention has resulted in the project being scaled up next year, and the electronic PCP will be rolled out across the Trust.

### **Patient and public involvement**

Patients and the public were not consulted about this project as they were not directly involved in the design of the intervention. Patient data was not collected during the investigation.

### **Ethics approval**

Ethical approval was granted by the University of Bradford (Ref: EC25923) and was not required by the Trust.

Amna Khan-Patel, Lead pharmacist for renal services, Bradford Teaching Hospitals NHS Foundation Trust.

### **Acknowledgements**

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Pharmacists at Bradford Teaching Hospitals NHS Foundation Trust.

### **References**

1. Elliott R, Camacho E, Campbell F, Jankovic D, Martyn St James M, Kaltenthaler E, Wong R, Sculpher M, Faria R, (2018). Prevalence and Economic Burden of Medication Errors in The NHS in England. Rapid evidence synthesis and economic analysis of the prevalence and burden of medication error in the UK. Available at: <http://www.eepru.org.uk/wp-content/uploads/2018/02/eepru-report-medication-error-feb-2018.pdf> [Accessed 22 Dec. 2019].
2. The Royal pharmaceutical Society of Great Britain. Keeping patients safe when they transfer between providers – getting the medicines right: final report. London; 2012. Available at: <https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Publications/Keeping%20patients%20safe%20transfer%20of%20care%20report.pdf> [Accessed 22 Dec. 2019].

3. Barber, N. (2010). Electronic Prescribing - Safer, Faster, Better?. *Journal of Health Services Research & Policy*, 15(1\_suppl), pp.64-67.
4. McCambridge, J., Witton, J. and Elbourne, D. (2014). Systematic review of the Hawthorne effect: New concepts are needed to study research participation effects. *Journal of Clinical Epidemiology*, 67(3), pp.267-277.

Data collection form

**Pharmacist – Data Collection Form**

**Ward:**



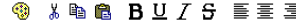




**Date:**

Time (minutes)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	
Time taken to review a <b>newly admitted</b> patient on the ward who has not been seen by a pharmacist																				
Time taken to review a patient <b>transferred from another ward to your ward</b>																				
Time taken to review a discharge prescription for a patient who <b>has been under your care</b>																				
Time taken to review a discharge prescription for a patient <b>who has not been under your care</b>																				
Time taken to complete pharmaceutical care plan																				

Please complete one form for each patient you clinically review. Please tick how long it has taken you to complete the stated task. If you have completed more than one of tasks listed above for the same patient please complete this on the same form for the patient.

Thank you for agreeing to participate in the project and for your time.

# Electronic pharmaceutical care plan

ZZZTEST, DIAG-ONE NHS: MRN: 3001642	<b>Pharmacy Care Plan</b>
<b>Date and time completed</b>	09/12/2019 <input type="text" value="15:28"/> 
<b>Presenting complaint</b>	<div style="border: 1px solid #ccc; height: 30px;"></div>
<b>Current Pharmaceutical Issues and Action Plan</b>	Segoe UI <input type="text" value="9"/>  <div style="border: 1px solid #ccc; height: 80px;"></div>
<b>Relevant Monitoring ( TDM , BP , Bloods)</b>	Segoe UI <input type="text" value="9"/>  <div style="border: 1px solid #ccc; height: 50px;"></div>
<b>Patient using MDS?</b>	<input type="radio"/> No <input checked="" type="radio"/> Yes 
<b>Medication changes</b>	Segoe UI <input type="text" value="9"/>  <div style="border: 1px solid #ccc; height: 20px;"></div>
<b>Community pharmacy details ( from Meds rec form)</b>	test comment from meds rec form 
<b>Discharge details ( from Meds rec form)</b>	<div style="border: 1px solid #ccc; height: 30px;"></div>
<b>Next Pharmacy review date</b>	see form <input type="text" value=""/> 

**Graph to show overall results for the mean time taken to carry out pharmacist tasks after each PDSA cycle**

