

Research Article

Impact of a Systems - Centred Intervention for Reducing Repeat Prescribing Risks in a Large Primary Care Organisation

Julie Price
Medical Protection Society, Leeds, UK

Diane Baylis
Medical Protection Society, Leeds, UK

Kate Taylor
Medical Protection Society, Leeds, UK

Matthew Mason
Medical Protection Society, Leeds, UK

Vanessa Burgess
NHS Lambeth Clinical Commissioning Group, London, UK

Shu Ling Man
NHS Lambeth Clinical Commissioning Group, London, UK

Paul Bowie
Institute of Health and Wellbeing, University of Glasgow, UK

ABSTRACT

Background and aim: Repeat prescribing of medications is a high volume general practice activity that carries significant patient safety risk. Building on previous work to design and test an online systems-based risk management model to identify and measure repeat prescribing hazards, we aimed to advise and support practices to implement recommended improvement actions, with the target goal to reduce baseline risk rating profile scores by 80%.

Methods: Multiple methods were utilised including use of a web-based risk assessment system, application of a risk rating scoring process, external review visits and follow-up visit or telephone support calls by experienced, independent Medical Protection risk professionals who made multiple improvement recommendations and provided related implementation advice to local practices.

Results: 45/48 practices in a large primary care organisation participated (93.8%), with 40 (88.9%) achieving the target goal of reducing their risk rating score by 80% or greater. The aggregated mean risk rating profile score reduced from 1781.8 (range: 405 to 3890; SD=907.2) to 146.6 (range: 0 to 1290; SD=255.0). 26 practice teams (57.8%) were able to comply with 100% of the improvement actions recommended, with a further 12 (26.7%) complying with 80.0 to 99.5% of recommendations. Overall the mean percentage of recommended actions implemented was 88.8% (range: 0 to 100%; SD=20.5).

Conclusion: The combined web-based benchmarking system and risk management method employed have potential to drive safety improvements in repeat prescribing systems at local practice and primary care organisational levels. The improvement approach described will be of strong interest to primary care organisations internationally as part of evolving patient safety priorities.

Keywords: Patient safety; Quality improvement; Test results; Risk management; Primary care

Introduction

A majority of National Health Service (NHS) patients in the United Kingdom (UK) who are prescribed medicines receive these as "*repeat prescriptions*" - medication items prescribed for long-term use, usually without extensive clinical monitoring [1]. It is a convenient system for both patients and clinicians as it allows for a more structured workload, fewer "*urgent*" requests and telephone calls and less traffic in frontline reception areas [2]. However, the process is complex and attracts a high level of risk as it involves over 20 steps from the initial decision to prescribe to the patient finally taking the medication [3]. While patients, General Practitioners (GPs), support staff, and pharmacists all have a role in the process and responsibility in creating related safety, it is the clinician who signs the prescription who is accountable for it from a medico-legal perspective [3,4].

With the ageing population growing and patients living longer, workload and risk related to the repeat prescribing process are increasing [1]. In the past two decades the quantity of repeat prescriptions issued has doubled from 5.8 to 13.3 items per patient per annum. Repeat prescribing now accounts

for around 75% of prescriptions issued in general practice, with approximately half of all patients receiving them [5,6]. Furthermore, a study of 300,000 patients in Scotland showed that 5.8% of patients were receiving 10 or more drugs [1]. For older people the figures are higher, with one in six patients over the age of 65 receiving 10 or more drugs

As a consequence of the significant increase in repeat prescribing, multifactorial impacts are apparent in terms of, for example, avoidable harm to patients, significant rises in drug budget expenditure, increasing practice workloads, negative patient experiences of related care processes, and variations in the quality of practice systems to monitor this activity [7-12]. Medico-legal case data also suggests around 20% of general practice litigation claims are medication related, providing further evidence of the safety management issues and consequences involved [13]. Overall, the available evidence strongly suggests that repeat prescribing of medications is a high-volume practice activity that carries a significant risk and, as such, is a priority area for patient safety improvement in primary care settings internationally [14,15].

In a previously published study [16], we described the implementation of an online systems-based risk management model (Figure 1) designed by the UK Medical Protection Society (Box 1) to identify, measure and reduce repeat prescribing risks in all 48 general practices in an NHS Clinical Commissioning Group (CCG) in early 2015. A total of 62 unique repeat prescribing hazards were highlighted (e.g. practices frequently experiencing difficulty interpreting medication changes on hospital discharge summaries) and 767 actions were recommended (e.g. alerting hospitals to illegible writing and delays with discharge summaries). The mean MPS risk rating score (Box 2) achieved by practices was 1784 points (range: 405 to 3890; SD=906.9), leading to 767 individual system improvement actions being recommended in 80 different categories. The mean number of recommended improvements to reduce risks per practice was 15.6 (SD=8.0. range: 0 to 34). Common improvement recommendations included amending the repeat prescribing protocol to ensure appropriate clinical action is recorded when high risk medications are not collected by patients or carers (33, 69%) and formally alerting hospitals to illegible writing, anomalies and delays with discharge summaries (21, 43.8%). Overall, the web based system and risk management approach implemented uncovered important safety issues and provided individual practices and the CCG organisation with system-wide information on hazardous repeat prescribing processes and how these risks could be reduced to as low as reasonably practicable.

However, while the first stage highlighted important system hazards and provided practices with recommended opportunities for improvement, only one third had made significant progress in implementing related actions after four months – the overall risk reduction rating was standing at <20%. This prompted the CCG and MPS to rethink the project method and insert a further intervention stage in the study. The proposed next steps of the project, therefore, were designed to follow through on the implementation of improvement recommendations with the individual practice participants with targeted support and advice from MPS as part of the risk reduction goal to strengthen local repeat prescribing system safeguards. In this follow-up study we, therefore, aimed to support individual practices and the CCG organisation to implement the improvement actions recommended by MPS in the original study to assess, quantify and reduce the overall risks posed to their repeat prescribing systems. The measureable goal agreed with the CCG organisation was to quantifiably reduce the overall baseline risk rating profile score by 80% for each practice.

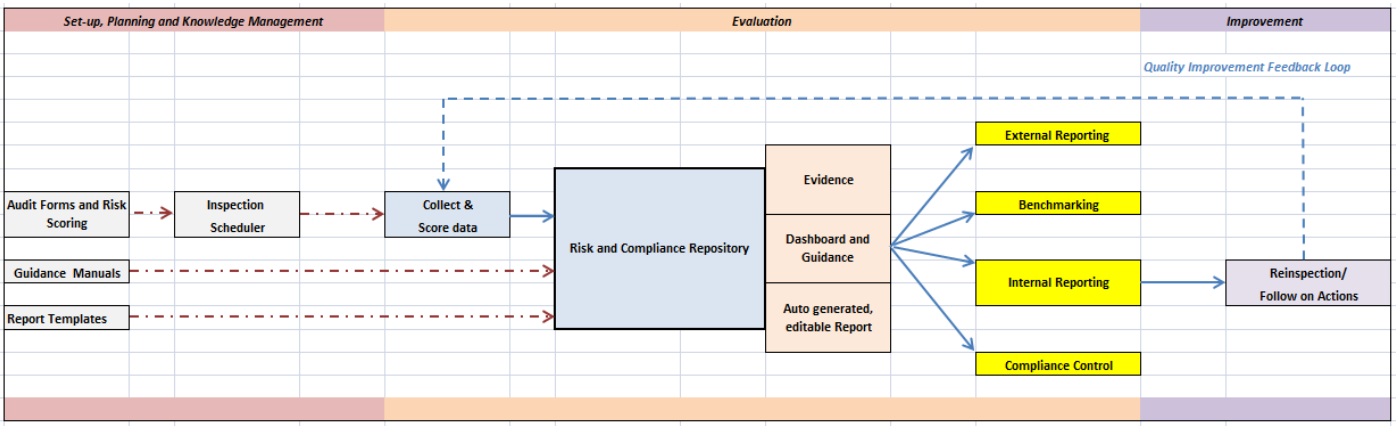

Figure 1: Conceptual model of the NHS CCG organisational level risk monitoring, evaluation and improvement system underpinning the study.

Box 1: About the medical protection society (MPS) education and risk management.

- MPS is a not-for-profit mutual organisation, which is at the forefront of understanding risks and how to overcome them. The organisation is the leading provider of comprehensive professional indemnity and expert advice to more than 300,000 doctors and health professionals worldwide.
- The Clinical Risk Assessments and other educational programmes featured in this study were developed because MPS is committed to patient safety and values the important link between education and risk management, while managing risk is an integral part of the development of every healthcare professional.

Box 2: MPS risk rating system.

- The rating system provides a combined point score out of 400 for *every* identified repeat prescribing hazard.
- Each hazard is externally and independently identified and risk assessed by an experienced MPS clinical risk facilitator in relation to its potential impact on the following four domains: patient safety (100 points), clinical risk (100 points), legislation (100 points) and financial risk (100 points).
- The combined points score acts as overall measure of risk which is visibly and quantifiably reduced on the web system (at individual practice level and aggregated NHS CCG level) as recommended mitigation actions are implemented over time.

Methods

Setting and participants

All 48 general medical practices in NHS Lambeth Clinical Commissioning Group (a London inner city area) were invited and financially incentivised to participate during 2016 - to cover practice time and use of resources - as part of the CCG Medicines Optimisation Plan.

Study interventions

A range of educational, information technology (IT) and improvement interventions were delivered by the MPS and local clinical leaders as an integrated package - more comprehensive descriptive detail of these original study interventions (1-5 below) have been previously published [16]. In brief summary form, the interventions included:

1. ***'Repeat prescribing' 1 day educational workshops:*** 1 GP and 1 practice manager per practice attended.
2. *Web-based risk assessment and monitoring system:* A 'risk and compliance' computerised service framework was design and implemented to provide 'audit and feedback' data oversight [17] at individual practice and NHS system organisational levels.
3. *External repeat prescribing risk assessments:* Undertaken during a visit by experienced MPS risk facilitators to comprehensively review each practice's current systems for repeat prescribing and identify risks across 6 pre-identified priority areas, e.g. staff training and protocol availability/content. A report on risks identified is generated for the practice and NHS CCG with each risk colour-coded in terms of prioritisation: short-term (red), medium-term (orange) and long-term (yellow).
4. *Application of a risk rating system:* This is described in Box 2.
5. *Follow-on-action by practices:* Practices were encouraged to implement report recommendations and enter related details of actions to reduce risks onto the 'follow-on actions' section of the online assessment and monitoring system.
6. *Follow-up practice review visits 2016 (the focus of this study):* MPS provided additional support to each practice and the CCG organisation as part of the risk reduction programme phase of the project. This involved a 2-tier approach as follows (along with the introduction of a new bench marker comparator intervention):

- **Tier 1:** 15 practices had proactively entered completed improvement actions completed on the online system (i.e., started to reduce their risk). MPS therefore arranged a telephone consultation with either the practice manager or lead prescribing GP to discuss the practice's repeat prescribing recommendations, as detailed in their support visit report, and provide assistance to facilitate the completion of these actions as well as explore issues or problems that may preclude the practice from completing the actions. MPS also provided the CCG organisation with a brief summary of the consultation and any actions required.
- **Tier 2:** For the remaining practices, MPS sought to arrange a further 'onsite' visit to discuss, face-to-face, any assistance required by the practice to complete the recommendations detailed on the practice 'follow-on action' section of the online system. MPS aimed to encourage practices to work through these recommendations and discuss any issues/problems that may preclude the practice from completing the actions. MPS also provided the CCG organisation with a brief summary of the support visit.
- **Benchmarking comparator**: Benchmarking is the process of comparing a practice's performance with an external standard (similar to 'audit and feedback' theory and practice in healthcare [17]). It is a recognised, useful tool that can motivate a practice to engage in improvement work and to help team members understand where system performance sits in comparison to others. Benchmarking can stimulate healthy competition and aid team members to reflect more effectively on individual performance to recognise and take action to improve patient care. Practices are able to check their risk reduction progress using a benchmarking tool (Figure 2) which enables them to view: their own risk score relative to all the other Lambeth practices and their own risk reduction by way of a green bar imposed on the overall red risk bar.

Data collection and analysis

Data on identified risks and actions implemented (e.g. documented short narratives and the risk rating scores) were uploaded to and generated by the aforementioned web based system. For research purposes, these data were then downloaded to a Microsoft Excel spread sheet to enable a basic content analysis [18] to be undertaken by PB to theme actions implemented (cross checked by JP with any disagreements

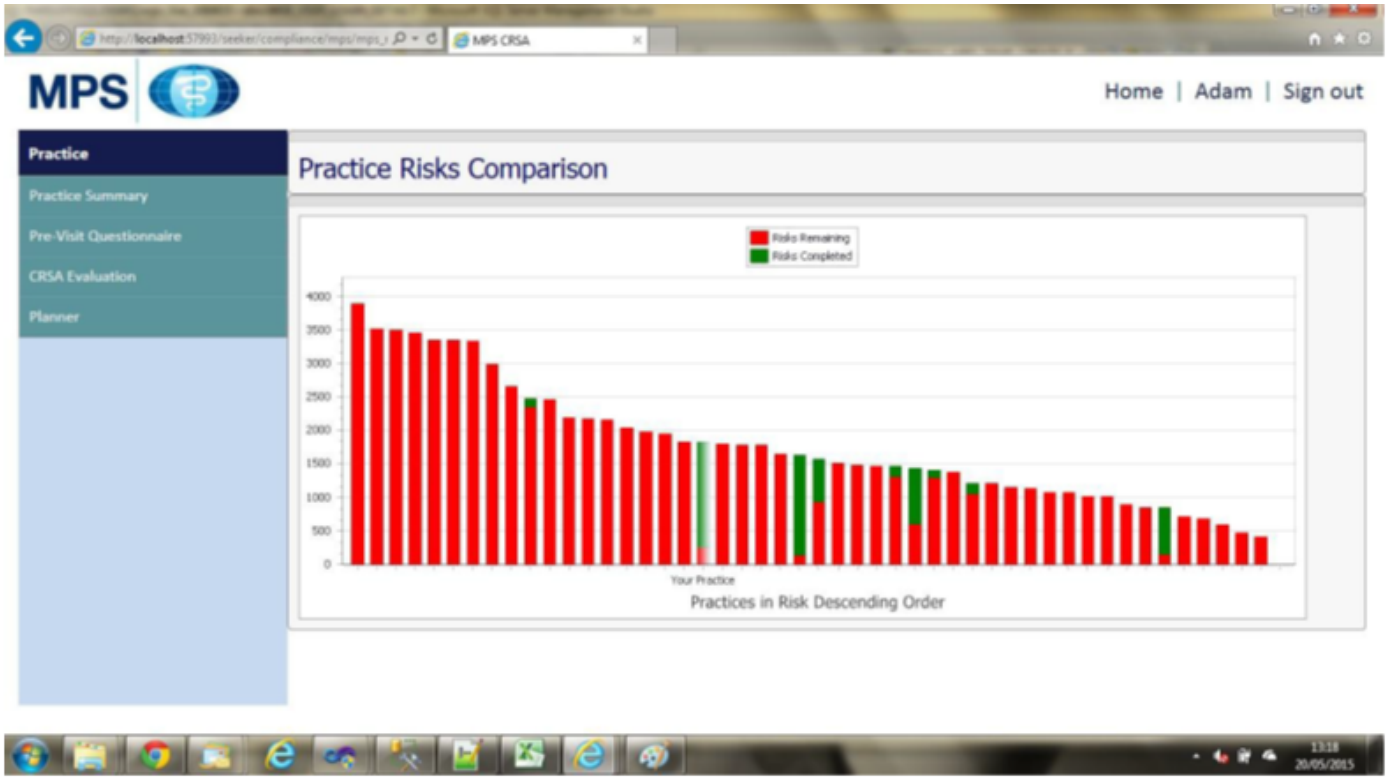

Figure 2: Screen shot example of the graphical MPS benchmarking tool enabling practices to check their risk reduction progress against others in the CCG organisation.

resolved by joint review until consensus was reached). For quantitative data, basic descriptive statistics (e.g. frequency counts, percentages, means, ranges and standard deviations) were generated and are presented in tabular and graphical form.

Results

A total of 45/48 NHS CCG practice participated in this follow-up study (87.9%). A breakdown of the demographic details of participating practices, including list size, number of GP partners and practice nurses, employment of a practice-based pharmacist and if they had acquired speciality training accreditation status, are outlined in Table 1.

Table 1: Demographic details of participating NHS CCG general practices (n=48*).

Study factor	n	%
Practice List Size		
<5000	9	18.8
5001-10000	28	58.3
10001-15000	9	18.8
15000+	2	4.2
Number of GP Partners		
Single-handed	6	12.5
2-3	27	56.2
4-6	12	25.0
7-9	2	4.2
10+	1	2.1
Number of Salaried GPs/Locums		
0	9	17.5
1-2	20	34.5
3-5	15	31.25
>5	3	6.25
Varies	1	2.1
Number of Practice Nurses		
1-2	30	62.5
3-4	16	33.3
>4	1	2.1
Not recorded	1	2.1
Healthcare Assistants		
Yes	5	10.4
No	43	89.6
Practice-based Pharmacist		
Yes	4	8.3
No	44	91.7
Specialty Training Practice Accreditation		
Yes	28	58.3
No	20	41.7

*2 practices merged during the risk reduction phase of the programme; a further 3 opted not to participate

Table 2: Practice data on follow-on actions, actions completed, aggregated risk rating profile score at the MPS initial visit and follow-up visit and risk reduction percentage (n=48).

Practice Code	*Follow-on Actions Recommended (n)	*Follow-on Actions Completed (n)	% Follow-on Actions Completed (%)	*After initial MPS visit aggregated rating Score (n)	After second MPS visit aggregated rating Score (n)	% Risk Reduction (%)
1	25	25	100	2985	0	**100**
2	12	12	100	1500	0	**100**
3	9	6	66.6	1010	235	**77**
4	4	4	100	470	0	**100**
5	8	8	100	710	0	**100**
6	14	14	100	1570	0	**100**
7	11	11	100	1140	0	**100**
8	7	7	100	850	0	**100**
9	28	27	96.4	3325	90	**97**
10	20	16	80.0	1970	400	**80**
11	13	12	92.3	1480	85	**94**
12	30	27	90.0	3340	205	**94**
13	24	8	33.3	2185	1290	**41**
14	19	19	100	1785	0	**100**
15	8	8	100	890	0	**100**
16	34	28	82.4	3890	540	**86**
17	4	4	100	405	0	**100**
18	30	0	0	3515	0	**0**
19	20	20	100	1825	0	**100**
20	10	10	100	1130	0	**100**
21	10	10	100	1075	0	**100**
22	11	11	100	1335	0	**100**
23	21	18	85.7	2450	460	**81**
24	18	18	100	2470	60	**98**
25	12	11	91.7	1285	50	**96**
26	22	12	54.6	2150	640	**70**
27	5	3	60.0	595	185	**69**
28	12	12	100	1460	100	**93**
29	17	17	100	2175	0	**100**
30	24	24	100	2650	0	**100**
31	19	12	63.2	1945	620	**68**
32	8	8	100	1065	0	**100**
33	10	10	100	1210	0	**100**
34	15	15	100	1635	0	**100**
35	10	10	100	1005	0	**100**
36	30	28	93.3	3455	185	**95**
37	27	20	74.1	3345	645	**81**
38	8	8	100	850	0	**100**
39	16	16	100	1800	0	**100**
40	27	26	96.3	3495	105	**97**
41	8	4	50.0	685	335	**51**
42	19	19	100	1820	0	**100**
43	13	13	100	1430	0	**100**
44	15	14	93.3	1375	35	**97**
45	12	9	75.0	1505	430	**71**
46	18	17	94.4	2040	140	**93**
47	12	12	100	1465	55	**96**
48	18	16	88.9	1785	135	**92**

*Data are slightly updated from that reported in original study

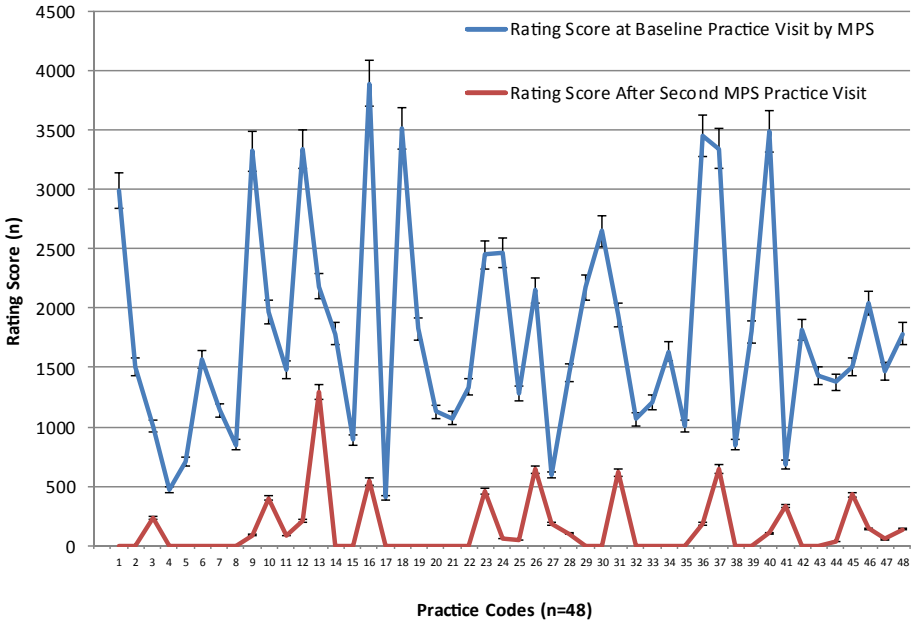

Figure 3: Chart illustrating a comparison of risk profile rating scores by individual practice at the initial MPS practice visit and after recommended improvements was implemented with subsequent MPS support and advice at the second practice visit.

A total of 40 of 45 practice teams (88.9%) achieved the stated goal of reducing their individual risk rating profile score by the agreed target of 80% or greater after completing the implementation of recommended actions for improvement prompted by the second follow-up contact visit by MPS (Table 2 and Figure 3). Overall the aggregated mean risk rating profile score reduced from 1781.8 (range: 405 to 3890; SD=907.2) to 146.6 (range: 0 to 1290; SD=255.0). The mean percentage risk reduction achieved for all practices was 89.9% (range: 0 to 100.00%, SD=19.0).

In terms of the implementation of actions for improvement, a total of 26 practice teams (57.8%) were able to comply with 100% of the actions recommended by MPS to reduce system risks for repeat prescribing, with a further 12 practices (26.7%) complying with 80.0 to 99.9% of improvement actions. The mean percentage of recommended actions that were implemented overall was 88.8% (range: 0 to 100%; SD=20.5)

In Table 3, typical examples of short-term, medium-term and long-term recommended actions for improvement are described alongside a qualitative description of how the highlighted

Table 3: Examples of short-term, medium-term and long-term recommended actions for improvement with a qualitative description of how practice teams responded to reduce related systems risks.

Practice code	Risk Category	Recommended Action	Practice Response
4	*Short Term*	Review procedure for generating repeat prescriptions. Important procedure should be carefully undertaken by a designated person in a quiet location where full concentration can be given to the task. Ensure staffs are fully trained and understand the importance of the process.	Repeat prescriptions are now handled by the practice pharmacist.
	Medium term	To ensure repeat medication items are not routinely delivered to patients, whether required or not, develop and agree with pharmacists a protocol to make sure only those medications required are dispatched. Excessive and over-prescribed medications are a possible hazard to patients and a waste of resources.	Invited local pharmacists to our clinical meetings to discuss the potential risk of delivering medicines which the patient does not need. Advised local pharmacies of our repeat medication policy on over prescribed medicines and what steps we are enforcing to reduce medication wastage. The pharmacies have altered some standard operating procedures to align with ours.
	Long Term	Describe in your repeat prescribing protocol the system for ensuring that appropriate action by the prescribing doctor is recorded when prescriptions for important medication (such as antipsychotics) are not collected.	The repeat prescribing policy has been rewritten to define this process.

	Short Term	Discuss with local hospital and CCG to ensure there is clarity on whose responsibility it is to prescribe the relevant categories of drugs. Remember that the clinician is responsible for any prescription he/she signs.	Regular feedback now given to medicines team at CCG and GP lead for medicines optimisation. Standard letters and documents available to practice from BMA to address to hospitals requesting GP to prescribe medicines not recommended for primary care. We are seeking shared care agreements where required and if unlicensed refer back to hospital clinician.
	Medium Term	Encourage staff to report all incidents and/or near misses. Consider using a 'grumbles' or 'incident log' book in reception to encourage reception staff to record near misses or incidents.	New incident book introduced.
13	*Long Term*	The GP should consider each request for NHS prescriptions, following a private consultation, on a case by case basis, using his/her clinical judgement.	GP will now only to consider these requests on a case by case basis.
	Short Term	Extend your system for safely issuing repeat prescriptions for DMARDs and other potentially toxic drugs. Ensure that the required blood tests are normal before prescriptions are signed for all these drugs.	DMARDS audit was completed in March 2015 following these recommendations and a follow-up audit will be completed in 12 months. All DMARDS have a prescribing alert to ensure clinicians review blood tests prior to issuing.
	Medium Term	Ensure a fax policy is in place. Use pre-set fax numbers whenever possible. Continue to encourage patients to sign up for EPS to reduce the need to fax prescriptions. MPS advises that faxing carries an increased risk of breach of confidentiality and/or faxes going astray and should be minimised.	Commonly used pharmacies now have the numbers programmed in to the fax machine. We have increased the use of EPS and are logging an entry that a prescription has either been faxed/posted in EMIS.
27	*Long Term*	Audit of prescription errors identified by local pharmacies. This is a useful exercise to discuss as a team and highlight any recurrent errors that might be addressed.	The topic has been discussed with the staff and it has been agreed that any errors are fed though the significant events meetings via the practice manager.
	Short Term	Formally alert hospitals to illegible writing, discrepancies, anomalies and delays with discharge summaries. Report anomalous discharge summaries to the CCG.	Acting on hospital letter: 2 weeks ago rang hospital consultant about discrepancy in dose of medication, as s/he suggested 5 mg of drug and our repeat prescribing showed 0.5 mg, confirmed our dose is right and it was a hospital error. Also our repeat prescribing manager is contacting hospital whenever discharge summaries are unclear. Incidents are now reported on Datix.
	Medium Term	Ensure the practice's repeat prescribing protocol outlines all the good prescribing systems that take place at the practice.	Amended old protocol and added new actions which originated from risk assessment.
39	*Long Term*	Consider a shorter time period for informing GP, and of cancelling and destroying uncollected scripts. Describe in your repeat prescribing protocol a simple system for ensuring that appropriate action by the prescribing doctor is recorded when prescriptions for important medication (such as antipsychotics) are not collected.	We are now checking box three monthly and those who have not been collected are given to GP and he will check for compliance.
	Short Term	Discuss with the hospital warfarin clinic how INR results could be delivered to the practice prior to the practice issuing a prescription. Ensure that you have an anticoagulant policy in place.	We now have a warfarin protocol in place. Team now implementing it - admin and clinical. Discussed and agreed in clinical meeting.
	Medium Term	Consider requesting pharmacy staff to sign for the prescriptions that they collect.	Implemented a process involving a book kept at the reception desk to record prescriptions collected by the pharmacies. The pharmacies all have their own book which they complete when they collect prescriptions and this identifies which prescriptions have been collected.
46	*Long Term*	Ensure that a record is kept of prescription pad serial numbers. Consider security of prescriptions and ensure that the consulting rooms are locked when not in use during the day and at night.	This task has been allocated to the practice administrator; she keeps manual records of all the prescription pads. And all the printer trays are emptied and pads are now locked away.

practice teams responded to each recommendation to provide evidence of a diverse range of changes and improvements to reduce risks related to their repeat prescribing systems. For example, a common short-term recommended improvement action was for a practice to "*Review procedure for generating repeat prescriptions...should be carefully undertaken by a designated person in a quiet location where full concentration can be given to the task*"; while the practice risk-reduction response to the recommendation was: "*Repeat prescriptions are now handled by the practice pharmacist*".

Discussion

The study achieved its main aim of advising CCG practices to reduce repeat prescribing related risks by making a series of system-wide recommendations and supporting them to implement these improvement actions. This was achieved using a combination of independent professional advice and follow-up contact from MPS and a web-based benchmarking system which provided visual 'audit and feedback' information on practice risk reduction performance over time compared with all other participating practices. The quantifiable goal to reduce the CCG risk rating profile rating by 80% in this high-volume area of primary care practice was achieved and surpassed, with just under half of participating reducing their risk by 100%.

It is interesting that following the initial support visits in 2015; only 15 practices had made attempts to implement the recommendations for improvement, which necessitated the addition of a further follow-up contact from MPS as agreed with the CCG. The practices reported that they found the 2nd stage of the repeat prescribing support contacts useful in prompting them to review the report again and begin to complete the follow actions. It should be recognised that some of the practices had started to implement recommended changes since the original support visits in 2015, but had not updated the online system to reflect these actions. In this instance MPS facilitators were able to demonstrate, at the second visit, how to do this to ensure that practice dashboards were up-to-date.

During the second visit, several practices reported a range of barriers to implementing some of the recommendations highlighted in the risk assessment report which are common to any improvement intervention [19-22], for example: rising workload; limited resources and time for improvement activity; staff requiring related training; motivating staff to change behaviours; and issues raised related to secondary care that outside of the practices control.

In this study it is probable that face-to-face support from MPS facilitators was a key success factor driving the system improvement process. Practices were engaged with the first stage but due to time pressures at work, staff shortages and some not fully understanding the online system, this may have precluded them from implementing their recommendations. With further face-to-face support and encouragement from external experts they were willing to implement the recommendations, which was an unexpected but welcome change management success.

A further positive study attribute was the continued strong engagement from the CCG and its general practices to participate in the project (albeit with minimal financial incentivisation) and this enabled the continued collection and monitoring of repeat prescribing risk data at the practice (meso) level and CCG (macro) organisational level, which acted as a significant prompt to implement a diverse range of improvement actions and reduce related risks to patients and the practice.

The evidence is strongly encouraging that the MPS online system can clearly identify important systems-wide risks and is feasible to implement at the practice level, which provides some evidence of its validity in terms of professional acceptability of the method and its potential to impact on local improvement and wider organisational learning. The study data generated will also make an important contribution to knowledge of hazards related to repeat prescribing and also potentially to the design of a preliminary coding taxonomy for future classification of risks in this area [19,22]. In our previous publication we outlined several limitations with our approach including, for example, that it is overly focused on reducing comparatively small numbers of safety incidents, rather than also understanding and learning from why repeat prescribing practice is more frequently safe and successful for patients [16]. In this additional stage of the study three practices declined to participate, however two practices had already demonstrated 95% and 100% risk reduction which is likely to explain non-engagement. Unfortunately, there was no time and resource to follow-up with the remaining practice to explore the barriers to non-engagement in this phase of the project, which would have added significantly to our understanding of the implementation and sustainability challenges posed by this type of approach. Informal feedback to MPS from many participating practices strongly suggested that they found the second review visit very helpful.

Key questions remain for the study approach adopted in terms of both feasibility of the method employed and the sustainability of the reported improvement gains made. The recent Berwick Report [23] outlined the limited capacity to analyse, monitor or learn from risk and safety data at the healthcare organisational level. Our approach offers a feasible method for organisations to systematically collect safety-related data and monitor, learn and improve to reduce overall risks and preventable harm to patients. The approach is relatively low-cost and is a comparatively small price worth paying given, for example, the potential human and financial costs associated with significant patient safety incidents and the potential for medico-legal action. Sustainability of the method and risk management improvements gained is still an open question, particularly as external advice and support from MPS risk professionals was key to encouraging practices to engage with the process and use time and resources to identify hazards and implement solutions to minimise risk to as low as reasonably practicable within their contexts. Further research and evaluation of the overall utility of the intervention is clearly necessary to provide further evidence of feasibility, impacts and sustainability (e.g. on patient safety improvements, effectiveness of practice safeguards, team experiences and acceptability of the process and so on) (Box 3).

Box 3: Ten most frequently recommended improvement actions to reduce repeat prescribing risks.

1. Ensure that the repeat prescribing protocol describes a simple system for ensuring that appropriate action by the prescribing doctor is recorded when prescriptions for important medication (such as antipsychotics) are not collected.
2. Ensure that the repeat prescribing protocol outlines all the good prescribing systems that take place at the practice.
3. Discuss with local hospitals and CCG to ensure that there is clarity of responsibility around the prescribing of relevant categories of drugs.
4. Formally alert hospitals to illegible writing, discrepancies, anomalies and delays with discharge summaries and report anomalous discharge summaries to the CCG.
5. Include details of the Electronic Prescribing Service (EPS) in the practice leaflet as well as the website.
6. Ensure out-of-date electronic protocols are stored in a separate folder and the date they are withdrawn recorded, rather than simply updating the electronic original.
7. Discuss with the local pharmacy issues raised about the Multi-compartment compliance Aids (MCAs). Keep a log of the specific issues in order to discuss with the relevant pharmacies. If issues are not resolved report the issues to Lambeth Medicines Optimisation Team.
8. Audit errors in prescriptions identified by local pharmacies and discuss as a team to highlight any recurrent errors that might be addressed.
9. Ensure that staff is aware that some drugs cannot be added to the EPS system and the patients are fully informed and acquainted with the system.
10. Implement a system that requires a prescription for controlled drugs to be signed for when collected.

Conclusion

The routine availability of organisational system level information on hazards, risks and mitigations related to a patient safety-critical area of clinical practice is very limited. The combined MPS risk assessment process and the web based monitoring system have potential to close this gap and contribute significantly to assisting NHS CCG organisations, and general practices in the UK and internationally, to monitor, learn and implement safety improvements in repeat prescribing processes [24,25].

ACKNOWLEDGEMENT

We would like to sincerely thank NHS Lambeth CCG and all the general practice teams who participated in this study. In particular, special thanks are due to the following MPS risk assessment facilitators, Lesley Walker, MPS Education Senior Risk Management Project Co-ordinator, and Stephen and Jess Bartlett from Invigilatis.

SOURCE OF FUNDING

The funding for this study was provided by NHS Lambeth Clinical Commissioning Group.

ETHICAL REVIEW

The study was judged to be a service evaluation of a quality improvement intervention, rather than research, and therefore it did not require ethical review under the 'Governance Arrangements for Research Ethics Committees' in the UK.

CONFLICTS OF INTEREST

JP, DB, KT, MM and VB are employees of MPS. PB received a consultancy fee from MPS for contributing to this work.

REFERENCES

1. Guthrie B, Makubate B. The rising tide of polypharmacy and potentially serious drug interactions 1995-2010: Repeated cross sectional analysis of dispensed prescribing in one region. BMC Med 2012; 13: 45-57.
2. Spencer R, Avery A, Serumaga B, Crowe S. Prescribing errors in general practice and how to avoid them. Clin Risk 2011; 17: 39-42.
3. http://www.medicalprotection.org/uk/for-members/press-releases/press-releases/mps-highlights-prescribing-as-one-of-the-top-risks-in-general-practice
4. http://www.medicalprotection.org/uk/practice-matters-issue-3/risk-alert-repeat-prescribing
5. Smet PA, Dautzenberg M. Repeat prescribing: Scale, problems and quality management in ambulatory care patients. Drugs 2004; 64: 1779-1800.
6. Swinglehurst D, Greenhalgh T, Russell J, Myall M. Receptionist input to quality and safety in repeat prescribing in UK general practice: Ethnographic case study. BMJ 2011; 343: 1-5.
7. Lillis S, Lord H. Repeat prescribing - reducing errors. J Prim Health Care 2011; 3: 153-158.
8. Taylor RJ. Repeat prescribing - Still our Achilles' heel. Br J Gen Pract 1996; 46: 640-641.
9. Avery T. Avoidable prescribing errors: incidence and the causes. Prescriber 2010; 21: 52-55.
10. Payne RA, Avery AJ. Polypharmacy: One of the greatest prescribing challenges in general practice. Br J Gen Pract 2011; 6: 83-84.
11. Howard R, Avery A, Bissell P. Causes of preventable drug-related hospital admissions: A qualitative study. Qual Saf Health Care 2008; 17: 109-116.
12. Comptroller and Auditor General. Prescribing costs in primary care. National Audit Office 2007.

13. Silk N. An analysis of 1000 consecutive general practice negligence claims. Medical Protection Society 2000.

14. https://www.gmc-uk.org/-/media/documents/Prescribing_guidance.pdf_59055247.pdf

15. Garfield S, Barber N, Walley P, Willson A, Eliasson L. Quality of medication use in primary care - mapping the problem, working to a solution: A systematic review of the literature. BMC Med 2009; 7: 50.

16. Price J, Man SL, Bartlett S, Taylor K, Dinwoodie M, et al. Repeat prescribing of medications: A system-centred risk management model for primary care organisations. J Eval Clin Pract 2017; 23: 779-796.

17. Ivers N, Jamtvedt G, Flottorp S, Young JM, Odgaard JJ. Audit and feedback: Effects on professional practice and healthcare outcomes. Cochrane Database Syst Rev 2012, 6: 2.

18. Neuendorf KA. The Content Analysis Guidebook. CA. Sage Publications Ltd 2002.

19. https://www.health.org.uk/sites/health/files/MeasuringAndMonitoringSafetyAPrimaryCarePerspective.pdf

20. Cox S, Wilcock P, Young J. Improving the repeat prescribing process in a busy general practice. A study using continuous quality improvement methodology. BMJ Qual Health Care 1999; 8: 119-125.

21. https://www.health.org.uk/sites/health/files/ImprovingSafetyInPrimaryCare.pdf

22. Vincent C, Burnett S, Carthey J. Measurement and monitoring of safety: Impact and challenges of putting a conceptual framework into practice. BMJ Qual Saf 2013; 1-4.

23. Francis R. Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry. London: The Stationery Office 2013.

24. http://webarchive.nationalarchives.gov.uk/20130107105354/

25. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_400572

ADDRESS FOR CORRESPONDENCE:

Dr. Paul Bowie, Institute of Health and Wellbeing, University of Glasgow, Scotland, United Kingdom, Tel: 0044 +141 3308330; E-mail: pslhumanfactors@gmail.com

Submitted: April 19, 2018; Accepted: May 01, 2018; Published: May 08, 2018