A Longitudinal Evaluation of a Multi-Sector Pre-Registration Programme for Pharmacists in Wales

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Background: Pharmacists traditionally work in either hospital or community settings and increasingly, primary care. As demands on healthcare continue to rise, pharmacists need to be capable of working in any setting with a well-rounded understanding of the patient journey and transfer of care. In response, Heath Education and Improvement Wales (HEIW) launched a multi-sector pre-registration pharmacy training programme. Trainees experience all three pharmacy settings throughout the year, in contrast to the traditional, single-sector programmes. The aim of this study was to explore the views of the now-qualified pharmacists, their tutors and line managers on the multi-sector programme and how it prepares pharmacists for practice.

Methods: This longitudinal study followed pharmacists through the multi-sector programme to approximately one-year qualified. Data were collected via interviews (n=27) with pharmacists (n=9), tutors (n=16) and line-managers (n=2), yielding almost nine hours of recorded conversation data. All data was transcribed, pattern coded and analysed thematically.

Results: Pharmacists maintained that they benefited from the multi-sector training programme and would choose to do it again. Pharmacists, tutors and line-managers considered that the programme provided a more holistic perspective of pharmacy compared to single-sector programmes and a greater understanding of the patient journey and transfer of care. Pharmacists had mixed views on their sense of preparedness for practice following their training, however this was not longstanding and appeared to be down to the big step from pre-registration to the responsibility of a qualified pharmacist, rather than poor training. Nonetheless, there remains a lack of consensus on how the programme is best structured and there is scope to increase the hands-on experience in primary care settings.

Implications: The multi-sector programme appears to successfully prepare pharmacists for practice. The programme equips pharmacists for their expanding role across different settings and the increasing demands on the pharmacy profession. The programme offers greater communication across sectors and a smoother transfer of patient care which benefits employers and patients as well as the pharmacists. We provide a series of recommendations that might be considered in future planning of multi-sector programmes further afield, including consideration of appropriate programme structure and rotations across sectors, additional hands-on experience in primary care settings and including increased time in hospital settings to ensure sufficient clinical knowledge is gained.

Deprescribing Antidepressant Medications: Lessons Learnt from The Current Literature

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Background: Australia has one of the world's highest antidepressant prescribing rates, placing a significant and unnecessary burden on both individuals and the healthcare system. Research has shown that this is due to an increase in long term use, rather than higher numbers of people being diagnosed with disorders for which antidepressants are indicated. Whilst antidepressants are an effective treatment for some, research has shown that 1 in 3 patients in primary care are taking antidepressants with no clinical reason to do so. Long term antidepressant use may increase risk of serious health complications (e.g., diabetes, cardiovascular events). Deprescribing, which is the process of ceasing an inappropriate medication under the supervision of a healthcare professional, offers a potential solution. The aim of this research is to examine the extant deprescribing literature, in order to identify approaches relevant to deprescribing inappropriate antidepressants in primary care.

Methods: This study followed the Arksey and O'Malley scoping review framework. A systematic search was conducted in April 2020 using Medline, EMBASE, CINAHL, Cochrane Library and clinical trials registries. Relevant journals were hand searched. "Deprescribing" and "Primary care" (and synonyms of) were the main keywords used in the searches. A content analysis was performed using NVivo to determine key elements of deprescribing intervention.

Results: 4927 search results were screened. 50 studies were found to eligible and were included in the review. 13 interventions focused on deprescribing mental health medications (benzodiazepines and antidepressants). These interventions used gradual withdrawal regimens often in conjunction with psychological therapy conducted by a psychologist or other mental health professional.

Implications: Deprescribing interventions for mental health medications have been intensive and require substantial resources. Research that explores more scalable interventions is required.

Potentially Hazardous Prescribing and Inadequate Medication Monitoring Related to Mental Health In UK Primary Care

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Background: Most patients with mental illness are managed entirely in primary care, yet there is a lack of data exploring potential safety issues related to prescribing in this setting for this population. Mental health related prescribing safety indicators (PSIs) have been developed to assess the safety of prescribing for patients with mental illness and identify those who may be at higher risk of harm, but they have not yet been implemented to guide improvement efforts. Therefore, we aimed to examine the overall prevalence, variation in the prevalence between practices and change in the prevalence over time of 18 potentially hazardous prescribing indicators and 4 inadequate medication monitoring indicators.

Methods: We performed a series of consecutive cross-sectional analyses by calendar quarter from 2009 to the third quarter of 2019 of routinely collected health data of general practices contributing to the Clinical Practice Research Datalink GOLD. Patients were included in the analyses and were defined as at risk if they had the potential to trigger a PSI because of an existing diagnosis, medication, age and/or sex. The intraclass correlation coefficient (ICC) and Median Odds Ratio (MOR) were estimated using two-level logistic regression models to examine variation in PSIs prevalence between practices. We also examined the relationship between patient and practice characteristics with a composite including 16 of the 18 prescribing indicators and a composite of the 4 monitoring indicators using multilevel logistic regression models. Unpaired t-test was used to compare the prevalence of the first and last quarter of each PSI.

Results: A total of 9.4% of patients at risk (151,469 out of 1,611,129) received at least one potentially hazardous prescription in the third quarter of 2019, and between practices this varied from 3.2% to 24.1% (ICC 0.03, MOR 1.22). For medication monitoring PSIs, 90.2% of patients at risk (38,671 out of 42,879) were exposed to at least one inadequate medication monitoring episode in the same quarter, with between practice variation of 33.3% to 100% (ICC 0.27, MOR 2.84) (Figure 1).

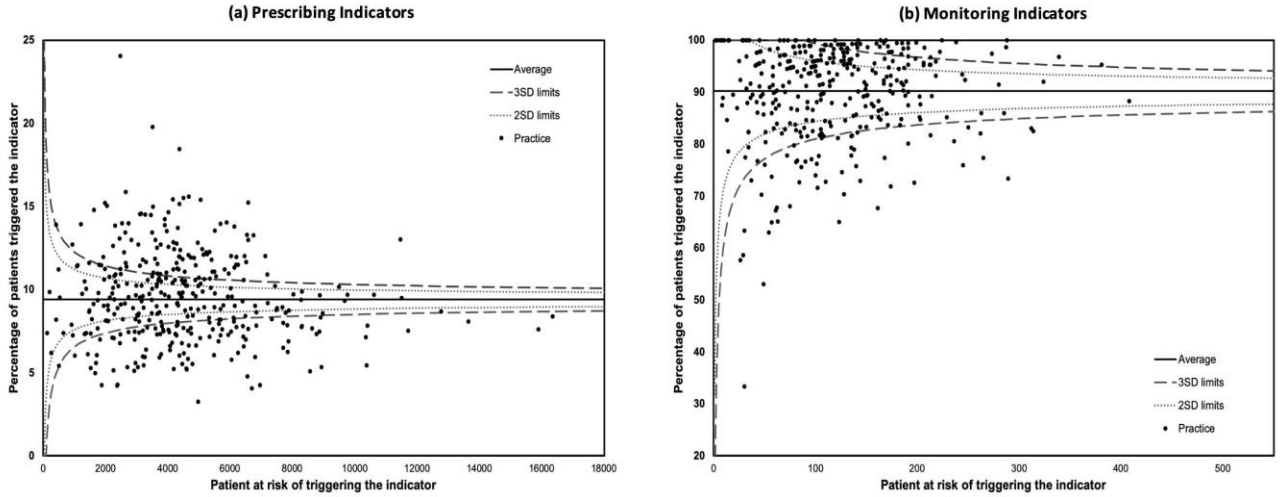

Fig 1: Proportion of (a) patients receiving at least one potentially hazardous prescribing and (b) patients experiencing at least one inadequate medication monitoring, for each general practice in the third quarter of 2019.

Women were found to have greater chance of receiving potentiality hazardous prescribing and experiencing inadequate medication monitoring than men (adjusted OR 1.43, 95% CI 1.41 to 1.45 and adjusted OR 1.43, 95% CI 1.41 to 1.45, respectively). Patients with more than 9 repeat prescriptions had the most increased risk of receiving potentially hazardous prescribing compared to patients with <2 repeat prescriptions (adjusted OR 30.2, 95% CI 29.4 to 31.0). Patients from the most deprived areas also had greater risk of receiving potentially hazardous prescribing compared to patients from the least deprived areas (adjusted OR 1.10, 95% CI 1.03 to 1.17).

When comparing the first and last quarters, the percentage of patients receiving at least one potentially hazardous prescription increased from 6.8% to 9.5% ($p < 0.05$) while the percentage of patients receiving at least one inadequate

medication monitoring increased from 78.5% to 90.1% ($p<0.05$). Of the 22 PSIs, 9 showed significant increase over the study period, 9 showed significant reductions and 4 showed no difference.

Implications: Potentially hazardous prescribing and inadequate medication monitoring commonly affect patients with mental illness in primary care, and the proportion of patients triggering some PSIs have been increasing over time with marked variation between practices after controlling for differences in patient characteristics. The information obtained by these indicators identify targets for remedial intervention and support the development of safety improvement efforts.

Ward To Board? The Role Of Cultures In The Governance Of Medication Safety

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Background: Professional cultures – that is, shared values, attitudes, and behaviours among a professional group – have been identified to play an important role in affecting aspects of patient safety in healthcare. High profile failures – such as the Francis Inquiry, Gosport Inquiry, Kennedy report, and the recent Okenden report – highlight the role of 'cultures' in patient safety and quality failings. In these reports there was evidence of 'poor' or unsafe cultures that existed which facilitated unsafe care and thus, the role of cultures has been well discussed in the media, policy, and research. Overall, it is argued that these cultures can affirm or contradict an organisation's safety aims. Despite academic and policy interest, there remains a gap in our understanding of the impact of cultures on the governance and assurance of medication safety.

Methods: This thesis addresses this gap by conceptualising the role of professional and local ward cultures on the governance and assurance of medication safety across three hospitals within one NHS Foundation Trust. Through an ethnographic lens, this thesis generates detailed insights from structured and unstructured observations (271 hours), interviews (20), and documentary analysis at micro (wards), meso (divisions), and macro (Trust) levels within an organisation to identify the different 'cultures' that existed and their relationship with medication safety.

Results: The role and influence of cultures, for example professional cultures, was studied at all levels in the organisation. Differing professional ownership existed towards medication safety, giving nurses and pharmacists a more 'present voice' than doctors. The incident reporting system – that is, the way professionals reported and learnt from medication incidents – was set up to involve nurses and pharmacists over doctors. Doctors spoke of being "out of the conversation" of incident reporting and identified that as a result, incident reporting was more of a job nurses and pharmacists engaged with. Therefore, where research identifies doctors being less involved in medication reporting due to their professional cultures, this research study identifies the importance of the reporting system in exposing nurses and pharmacists to incident reporting and how it affects ownership of medication safety.

A focus on inter- and intra-professional working around medication safety identified a fluid conceptualisation of hierarchy across the three study sites. Hierarchical barriers existed but professionals used key tactics to flatten this hierarchy to ensure medication safety. These key tactics included the use of semantics – for example specific vernacular to identify knowledge and experience to persuade the person in 'power' to change their practice e.g. prescribing. This identifies the importance that professional cultures may be 'broken down' with certain tools and thus, this presents a fluid understanding of hierarchy between professionals. This study also identified the key role professional cultures play in the operationalisation of external governance, exposing senior leaders' struggle to influence change medication-specific cultures in line with organisational aims.

Implications: This study is one of the few to specifically consider the effect of cultures on the governance and assurance of medication safety in the hospital. It also contributes to organisational learning literature by following the operationalisation of two pieces of external governance through a complex and multi-layer organisation and identifying the role of cultures at every level of the organisation. Whilst culture as a concept is nebulous and its impact on safety and quality hard to define, this study has identified the manifestations of culture – for example hierarchy – which impact the governance of medication safety.

Results Of Precept2: A Cluster RCT Comparing Two Methods of Improving Uptake of Mgso4 for Neuroprotection in Preterm Labour

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Presenting Author: Ruta Margelyte

Background: In preterm labour, magnesium sulphate (MgSO4) is a neuroprotectant and reduces the risk of Cerebral Palsy (CP) by 30%. Despite national guidance recommending its use in all preterm (≤30 weeks gestation) births, uptake varied widely across maternity units. In 2018 NHS England rolled out the National Precept Programme (NPP) to increase MgSO4 uptake. The NPP includes the dissemination of the Precept Quality Improvement (QI) toolkit, comprised of practical tools and training to improve maternity staff knowledge of MgSO4 and increase uptake. This trial compared the effectiveness of two different methods of implementing the toolkit.

Methods: A cluster randomised controlled trial of 40 maternity units. Units were eligible if they had ≥ten pre-term deliveries annually and MgSO4 uptake of ≤70%. Control units followed the NPP standard implementation, receiving the toolkit materials, funding and regional-level support for a midwife 'champion'. Intervention units additionally received further clinical backfill funding and unit-level coaching. The intervention was implemented over nine months with a further nine months follow-up. Anonymised patient-level data came from the National Neonatal Research Database. Linear regression modelling compared groups for MgSO4 uptake at follow up, adjusted for baseline uptake. Trends in uptake over time, missing MgSO4 data over time, reasons MgSO4 was not given, and variations in uptake by patient and maternity unit characteristics are described.

Results: MgSO4 uptake improved significantly in both trial arms. There appeared to be similar benefit from both implementation methods. Data recording also improved over the study period with the amount of missing MgSO4 data decreasing. This improvement again appeared similar across trial arms. Disparities in uptake at baseline by socio-economic factors, level of birth unit, and gestational age had equalised by follow-up. Full details of results will be included in the presentation if accepted.

Implications: This is the first RCT comparing two methods of implementing a Quality Improvement toolkit in perinatal medicine. It is possible that a real difference in outcome between the groups may have been masked by contamination between trial arms and variations in local implementation practices. Both are challenges particular to trials involving QI projects. Findings show that with appropriate tools, support and investment in staff learning, significant improvements in perinatal care are achievable. Full details of implications will be included in the presentation if accepted.

How Can We Improve Training and Support for Families Who Do Medical Procedures at Home?

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Background: It is now commonplace for family members to do medical procedures at home, which were historically only performed by highly trained healthcare professionals on hospital wards (1). Parents of children with complex medical needs provide feeding tube care, tracheostomy care, home oxygen etc. In comparison to healthcare professionals, parents receive very little training and support. Many feel unprepared and anxious, and worry about hurting their child (2,3). In an analysis of incident report data on children with feeding tubes, there was evidence that poor training for parents was resulting in harm to children (4). This series of studies explores how we can improve training and support for parents who care for children with gastrostomies (feeding tubes), and evaluates a training package co-produced with families and healthcare professionals.

Methods: We formed a stakeholder group of parents, paediatricians and nurses from the hospital and community. We conducted online surveys with 150 parents who care for children who need specialist medical care, to understand their experiences and ideas for improvement. We produced 16 videos with parents and healthcare professionals to train and support parents caring for children with gastrostomies, and evaluated the videos through an online experiment and surveys on acceptability and implementation with healthcare professionals and families.

Results: Parents' experiences of training were highly variable. Two in five families felt 'not at all confident' or 'not very confident' in the first week of caring for their child's gastrostomy at home. Parents rated supervised practice with healthcare professionals, training videos which are "real" and based at home, and hands-on practice with dolls and equipment as particularly useful, and wanted more preparation for managing problems. Parents liked how real life the example video shown was, and rated all the video topics as "very helpful". In an online experiment, the set of videos we co-produced with families and healthcare professionals significantly improved learning.

Implications: There is too much variability in the training and support families receive to care for children with gastrostomies, and some parents are falling through the gaps. Parents would benefit from more training prior to taking their child home from hospital to ensure parents are prepared, not just for routine care but also for problems. Videos and other training materials could be made available to parents prior to the child's surgery, to be revisited as needed. Parent also want more hands-on practice. We are currently piloting hands-on training with 3D-printed models with families. There is much that can be done to prepare families which does not require substantial staff time and resources, and can improve the lives of families, reduce avoidable harm to children and reduce demand on services. There is huge value in involving families in designing improvements to services, and treating them as equal partners. This research provides a template for how to improve training for other family carers who do medical procedures at home.

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Combining Research and Design Approaches to Optimise Inpatient Medication Storage Systems to Support Safe and Efficient Medication Administration

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Background: Nearly every patient admitted to hospital will receive medication during their stay. However medication errors are an important cause of patient morbidity and mortality, as well as an economic burden for healthcare institutions. Research suggests that current methods of storing medication on hospital wards are not fit for purpose, contributing to inefficiency and error.

Our aim was to improve medication storage in inpatient areas, to facilitate safe and efficient medication administration. Objectives were to:

1. explore the challenges associated with current medication storage and administration systems and identify the needs for improvement as perceived by relevant stakeholders;
2. design a frugal and practical solution to support safer and more efficient medication storage and/or administration.

Methods: We conducted a qualitative research study comprising medication round observations and interviews with staff and patients, on six wards in a large English hospital trust. Wards were selected through purposive sampling, aiming for maximum variation.

Observations focussed on the tasks, events and decision-making processes associated with medication administration and medication storage during medication administration rounds. Interviews included questions on how different types of storage were used, satisfaction with the current system of medication storage and the experiences of patients who administer their own medication as inpatients. Data were analysed thematically. National Research Ethics Service approval was obtained.

Working with designers using people-centred design methods, we synthesised the data collected according to the tasks, people and systems involved. Alongside human insights, this allowed for a deeper understanding of the needs, motivations and behaviours of people affected by how medication is stored. These were then translated into opportunities for intervention and the identification of prototype solutions for testing.

Results: Eighteen observations of medication rounds were undertaken by a researcher, as well as two by a lay person. We conducted interviews with 12 patients, 10 nurses and 3 pharmacy staff.

Following data synthesis, five problem areas were identified: poor management of multiple storage facilities and practices; lack of visibility and organisation of medication within trolleys; inadequate size of storage; lack of ownership alignment and knowledge of standard practice; use of key locks; and issues relating to the use of computers on wheels. These were presented to an advisory group comprising designers, nurses, patients, pharmacists and quality improvement experts. Five approaches to optimising inpatient medication storage systems were then developed and presented back both to the advisory group and to nurses who had participated in the study. Systematic and consistent physical organisation of medication in storage facilities, particularly medication trolleys, and integrating and implementing effective best practice principles were selected as approaches for taking forward and developing into prototypes for testing.

Implications: This study identified a number of challenges associated with medication storage. It also highlighted the importance of consulting those involved with medication administration when making changes to practice. Next steps will be to implement and test the initial prototype solution developed through this work. to empower healthcare professionals with actionable methods and tools to organise medication storage in an efficient manner, that meets the individual needs of the setting. This will be done using a plan-do-study-act approach, in collaboration with the organisation's quality improvement team. Additionally, based on the patient interviews, considering and facilitating patients' playing an active role in their medication administration e.g. through self-administration or being able to check medication prepared for them, may facilitate improved patient satisfaction.