The Report of the Short Life Working Group on reducing medication-related harm

Contents

Executive summary

Patient safety is fundamental in any healthcare system. The World Health Organization (WHO) aims to coordinate, disseminate and accelerate improvements in patient safety worldwide. In March 2017, WHO launched its third Global Patient Safety Challenge: *Medication Without Harm*. The aim of this Challenge is to reduce severe avoidable medication-related harm globally by 50% in the next 5 years, as it is estimated the worldwide burden of medication errors is in the region of $42 billion.

In support of WHO's campaign, the Department of Health and Social Care commissioned a review of the evidence base on medication errors in England to assess the extent and scale of medication error. The Department also established a Short Life Working Group (SLWG) in September 2017 to provide advice to the Secretary of State for Health and Social Care on the scope of a programme of work to improve medication safety.

The SLWG met four times between September and December 2017, and recommended the establishment of a medication error and safety programme as well as a number of priorities to create positive change in medicines safety.

The SLWG agreed that in an increasing digital age, further technological developments to aid patient safety were key. The roll-out and optimisation of electronic-prescribing and medicines administration in secondary care is important as the benefits are now well documented. These systems demonstrate, amongst other things, a substantial reduction in medication-related error, particularly when they have been optimised after implementation. In primary care settings, the use of interventions such as pharmacist-led information technology intervention (PINCER) should be employed; which, by computer searches, identifies patients at risk from hazardous prescribing. From here, pharmacists can work with each general practice to develop an action plan to address the issues identified.

Technology will also play an important part in better shared decision-making, so that patients and carers are encouraged to ask questions about their medications. By improving the information available to patients, it will promote joint decision-making and healthy challenge between patients and health care professionals. With patients and carers playing a more active role in their medication management, we will move towards an environment in which they are their own safety advocate. This can be further facilitated through patient friendly packaging and labelling, and work should be done to ensure that labelling contributes to safer use of medicines.

Cultural change within health care systems must also occur in order to deliver the best results for patients. Health care professionals should work closely together across all areas, in order to not only address the significant issue of over medication, which can lead to medication safety issues, but improve shared care with more comprehensive knowledge and support. Professional regulation in parallel to this will help adequate training in safe and effective medicines use be embedded in undergraduate training, as well as continuing professional development.

In order to create an environment which best promotes shared learning professional regulators and leadership bodies should encourage the reporting of medication errors. To promote further learning the SLWG has tasked the NHS Specialist Pharmacy Service to build an online repository, consisting of examples of good medicine safety practice. Similarly, a set of prescribing safety metrics is being developed by NHS Digital and NHS Business Services Authority (BSA). The purpose of this is to develop indicators that quantify prescribing practice

that has a higher risk of harm and that is associated with admission to hospital; with the aim of promoting safer prescribing and reduce medication error.

1. Background

Medication is the most common intervention in medicine and is a critical component of modern healthcare, with over 1 billion prescription items dispensed in the community in 2016. Medication also represents a substantial total cost to the NHS, being the second largest outgoing in the NHS after staff costs; the total net ingredient cost (NIC) is over £9 billion for prescription items dispensed in 2016 in primary care alone, and about £16 billion for total annual drug expenditure.

Medication has a huge potential to do good, but errors can occur at many points in the medication cycle – prescribing, dispensing, administering, monitoring and use. Such errors can include errors of omission and commission. However, there is no universally agreed definition of medication error. For example, an error might include administering a drug slightly later than planned in a hospital setting or prescribing an incorrect dosage.

Medication errors vary in type, setting and impact. Many errors will be noticed before they reach a patient or would have little impact on a patient, but others can have devastating consequences. The impact of a medication error can also vary dramatically according to the mistake made and the individual it affects; the same mistake made in relation to two different people can have vastly different outcomes.

Whilst there is no consensus on the definition of medication error the World Health Organization (WHO) hold the view that preventable errors can occur in any part of the medication process and a broad definition should be adopted.

In 2016 the WHO published a paper *Medication Errors: Technical Series on Safer Primary Care,* which made reference to The United States National Coordinating Council for Medication Error Reporting and Prevention definition of a medication error: *"any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems, including prescribing, order communication, product labelling, packaging, and nomenclature, compounding, dispensing, distribution, administration, education, monitoring, and use."*

2. WHO Global Patient Safety Challenge

The World Health Organization (WHO) has focused on improving patient safety worldwide through its Patient Safety Programme.

In March 2017 WHO launched its third Global Patient Safety Challenge: Medication Without Harm. Beyond the harm caused to patients, it is estimated unsafe medication practice and errors are associated with a worldwide annual burden in the region of $42 billion. Reducing the impact and frequency of medication error will therefore help to improve patient safety, relieve economic burdens and develop healthcare systems.

WHO has identified three early priorities for action: high risk situations, polypharmacy and transitions of care. These sit within an overarching strategic framework of four domains:

- Patients and the public

- Medicines

- Health care professionals

- Systems and practices of medication.

Through the *Medication Without Harm* challenge WHO aims to *"reduce severe avoidable medication related harm globally by 50% in the next 5 years"*. This will be achieved by encouraging countries and key stakeholders to focus on early action priorities as well as developmental programmes to improve practice and health systems.

3. Medicines Safety Programme

Improving medicines safety requires action across health and care professionals, care settings and services, and with patients and the public. This means designing safety into systems, recognising the increasing complexity of care for a population that is ageing and living with different health conditions, and working closely with patients to ensure they are able to use medicines effectively.

In support of the WHO campaign, the Secretary of State for Health and Social Care asked a Short Life Working Group to advise him on what should be done to reduce medication errors, including:

- Improving how technology is used such as electronic prescribing and medicines administration systems and the use of software tools to identify patients prescribed drugs that are commonly and consistently associated with medication errors.

- Understanding how best to engage patients with their medicines.

- Supporting 7 day clinical pharmacy services in acute hospitals.

- Working with care homes and GPs.

- Improving the transfer of information about medicines when patients move between care settings, as we know that these transition points can be times when things go wrong.

To support the advice of the Short Life Working Group, the Department commissioned an evidence based review of the available literature on medication error, with a focus on the UK, to assess the scale of the issue. Similarly, NHS Digital and NHS Business Services Authority were tasked to develop metrics to assess and monitor higher risk prescribing, and link this with outcomes such as hospital admission. These areas of work have run in parallel.

4. Short Life Working Group

In September 2017 the Short Life Working Group (SLWG) was established. The purpose of this group was to advise on the scope of a programme to improve safety in the use of medicines, including how to reduce medication errors and establish the best way to measure progress.

The objectives of the group were to:

- In the context of the WHO Global Patient Safety Challenge *Medication Without Harm*, advise on the overall strategy and programme required to drive improvement in medicines safety, drawing on work underway across NHS England, NHS Improvement, the Care Quality Commission (CQC), the Medicines and Healthcare products Regulatory Agency (MHRA) and in the NHS and academia.

- Identify those areas in which efforts need to be targeted in the short, medium and long-term.

- Provide clinical and academic expertise and advice on the current barriers and issues in medicines safety, and how these can be overcome.

- Advise on the best ways to measure medication errors and medication safety.

The SLWG considered the roles of both health professionals and patients, and particularly considered high-risk groups of patients (such as children, older people and people with learning disabilities), high-risk drugs, and high-risk situations (such as transition points). The SLWG discussed the use of technology and how the industry can improve safe use of medicines.

The framework proposed by WHO has helped to structure the SLWG in terms of its thinking. WHO identified four key domains to the medication error challenge: patients and the public; medicines as products; healthcare professionals; and systems and practices of medication. The SLWG used these domains to consider possible areas for improvement, as well as new ways of thinking to drive positive change. Within each domain, the SLWG discussed the current situation and identified areas where progress could be achieved.

Between September and December 2017 the SLWG met four times. This report outlines the main areas of discussion by the group, and although it is not all-encompassing, the report highlights key recommendations for improvement in medicines safety.

5. WHO Domain - Patients and the Public

"Patients and the public are not always medication-wise. They are too often made to be passive recipients of medicines and not informed and empowered to play their part in making the process of medication safer". [WHO]

Shared Decision Making

Shared decision making is when health professionals and patients work together. This puts people at the centre of decisions about their own treatment and care. During shared decision making, it is important that:

- Care or treatment options are fully explored, along with their risks and benefits.

- Different choices available to the patient are discussed.

- A decision is reached together with a health and social care professional.

The group agreed that shared decision making was important in improving medication safety and were clear that patients and their carers should be encouraged and supported to play a more active role in managing their medication, including when to stop previously prescribed medication. This would allow patients to better manage their own care, be their own safety advocate, and have more confidence to raise concerns and question clinicians about the drugs they take.

Meaningful conversations between clinicians and patients before prescriptions are issued may also lead to fewer drugs being dispensed as opposed to unnecessary over prescribing of drugs, which are then not taken by a patient because they don't see the value of them. This could reduce both the risk to patients of unnecessary and avoidable admissions to hospital and avoidable costs to the NHS. NHS England's initiative, as part of the Medicines Value Programme, to deploy clinical pharmacists into general practices provides an obvious focus of expertise to take a lead on improving shared decision making on medicines, as well as improving medication monitoring and review.

There is much work already underway to encourage shared decision making. A shared decision making collaborative has been established consisting of over 40 organisations, including the National Institute for Health and Care Excellence (NICE), NHS England (NHSE) and the General Medical Counsel (GMC), to support the wider health and care system to embed shared decision making into routine practice. The aim is to ensure that those who deliver and those who receive care work together to select tests, treatments and support, based on evidence and what really matters to the individual. The SLWG recommended that this work is considered to see if a greater emphasis on shared decision making around medicines would be helpful.

Informing Patients

Digital technology has an important role in helping shape patient knowledge on medicines. This could take the form of apps which provide key material on common drugs or developing information online about medication safety. NHS Digital Domain A is already improving the level of digital support for patients, including transforming the NHS Choices website, developing the NHS Apps library and encouraging patient portals to allow patients access to their health records. Therefore, working closely with NHS Digital is important to best promote reductions in

medication error, through improved patient and carer knowledge. Understanding how patients wish to access information is also important, as digital solutions may not be appropriate for everyone.

Patients need access to details of their prescribed medication whether in primary or secondary care. Whilst electronic prescribing systems can provide the opportunity to provide better information for patients, particularly when transferring between care settings, it can also present some practical problems. For example if patients can no longer view a paper drug chart on their hospital bed, they may find it more difficult to have constructive conversations with healthcare professionals about their medication. Therefore, when implementing an electronic system, it is important to ensure that patients still get easy access to their medication information, possibly through the use of portable electronic devices.

The Academy of Medical Royal Colleges' *Choosing Wisely* campaign is a good example of clinicians supporting patient involvement in their care. The Choosing Wisely principles encourage patients get the best from conversations with their doctors, pharmacists and nurses by asking five questions:

1. Do I really need this test, treatment or procedure?

2. What are the risks or downsides?

3. What are the possible side effects?

4. Are there simpler, safer options?

5. What will happen if I do nothing?

Using behavioural insights methodology will also provide a valuable opportunity to determine key points at which to engage with professionals and patients about medication understanding and choice. This will help to improve delivery and engagement. There is already work underway funded with Pharmacy Research UK to explore patients' use of patient held medication records. Behavioural insights are also to be used in work to improve patient safety alerts, and has been used on major public health issues such [antimicrobial resistance](#), demonstrating reductions in inappropriate prescribing of antibiotics in primary care.

Case study

Stopping over-medication of people with a learning disability, autism or both (STOMP)

"On 14 July 2015, [reports](#) were published highlighting widespread inappropriate use of antipsychotics and other medicines used to treat mental illness in people with learning disabilities.

Following these reports, NHS England led a 'call to action' which brought together representatives of professional and patients groups to make sure changes were made to these inappropriate practices. This led to a pledge to reduce over medication and the start of the STOMP project about stopping the over use of psychotropic medicines. The three year project runs until 2019.

It is estimated that every day about 35,000 people with learning disabilities or autism are prescribed psychotropic medicines when they do not have a diagnosed mental health condition, often to manage behaviour which is seen as challenging. This includes medicines used to treat psychosis, depression, anxiety and sleep disorders. It also includes epilepsy medication when it is only used for its calming effect, rather than to treat epilepsy.

STOMP is about making sure people get the right medicine if they need it and that people get all the help they need in other ways as well. It is about encouraging people to have regular medication reviews, supporting health professionals to involve people in decisions and showing how families and social care providers can be involved. STOMP also aims to improve awareness of non-drug therapies and practical ways of supporting people whose behaviour is seen as challenging." [1]

Key Priorities

The key priority in this area is working with patients and their families to understand where improvements can be made. The SWLG identified a number of areas that might help:

- Improved shared decision making so that patients and carers are encouraged to ask questions about their medications and health and care professionals actively support patients and carers in making decisions jointly, including when to stop medication.

- Work closely with NHS Digital and others to improve information for patients and families, and improve access to inpatient medication information.

- Encourage and support patients and families to raise any concerns about their medication.

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[1] https://www.england.nhs.uk/learning-disabilities/improving-health/stomp/

6. WHO Domain - Health Care Professionals

"Health care professionals sometimes prescribe and administer medicines in ways and circumstances that increase the risk of harm to patients" [WHO]

The SLWG considered the importance of shared care, and appropriate training and support for health and care professionals.

Shared Care and Education

High risk drug prescribing in a primary care setting was highlighted as an important issue to consider. GPs need to be supported by secondary care specialists to help ensure safe and effective prescribing and monitoring of medication. National guidance on appropriate shared care arrangements between GPs and consultants would help ensure that clinicians have access to the right information to make decisions and that decisions are made by those with the appropriate knowledge. It would be helpful to agree which medications would be particularly useful for shared care arrangements across primary and secondary care.

Working with professional regulators, and leadership bodies, to enhance professional development and education is important. This should take the form of undergraduate education or continued professional development and re-validation, with a focus on achieving best outcomes from medicines. The SLWG however recognised that professional development was not the only answer. Initiatives such as the [Prescribing Safety Assessment](#) which assesses foundation doctors prescribing skills are to be commended, and they should build on appropriate training in pharmacology and therapeutics. The expansion of non-medical prescribing means that all prescribing professionals must ensure they maintain their competence in the areas they specialise in.

The SLWG identified a good example of further education in the [report](#) by the Royal College Physicians (RCP), in supporting junior doctors and prescribing. The report has key recommendations for better education, collaborative working and shared learning. It aims to give guidance which will ultimately enhance support for junior doctors and create safer care for patients in the long run. It is important the future programme on medication error connects with such initiatives to ensure the maximum level of impact. A recommendation from the report is that multidisciplinary teams all have a degree of responsibility for supporting junior doctors in safer prescribing. This highlights the potential of schemes including using [pharmacist 'buddies'](#); which creates a positive cultural and practical movement towards improving medication safety. The RCP report builds on earlier work from the General Medical Council; [Good practice in prescribing and managing medicines and devices](#). These guidelines include outlining the importance of healthcare professionals sharing information to promote safe transfer of care, reviewing prescriptions (particularly when dealing with multiple conditions), as well as the responsibilities involved with shared care.

Case Study

Foundation Doctor - Pharmacist Buddy Scheme; County Durham and Darlington NHS Foundation Trust

"Slips and knowledge-based mistakes are the most common type of prescribing error seen amongst F1 doctors when commencing a new job or rotation. Pharmacists are ideally placed to prevent and correct such errors. Indeed, although F1 doctors in the [EQUIP study](#) were found to

have a prescribing error rate of 8.4% almost all of these were detected and corrected by the pharmacist. F1 doctors report that they often feel inadequately supported when prescribing, and support by pharmacists is valued. Studies have shown that one to one education and feedback can lead to prescribing improvements.

[This study] sought to foster a positive pharmacist-F1 relationship within the acute Trust by increasing the contact with pharmacists during the induction period and adding structure to the initial meeting between the ward based pharmacist and F1 doctor.

The majority of foundation doctors and pharmacists felt that the pharmacy buddy scheme was a valuable exercise and it was believed that this model could be replicated in other trusts across the UK.

Subjectively, F1 doctors reported increased confidence and felt less likely to make mistakes whilst pharmacists felt that the exercise improved their working relationship with junior doctors and 59% of pharmacists felt that having an early opportunity to discuss prescribing and ward based issues had reduced prescribing errors on the ward.

For the scheme to be effective, it appears to be important to have a pharmacist based on the same ward as their buddy and to ensure that the activity is timetabled."

Polypharmacy

Professionals should also work together to help reduce inappropriate polypharmacy and overmedication. Work to tackle overmedication is already underway by NHS England through the Medicines Value Programme, which should be encouraged and supported. The programme aims to use structured medicine reviews to get the best health outcomes for patients, by reducing the prescribing of medicines which pose no clinical benefit to the patient. By 2020/21, 2000 pharmacists will be deployed in general practice to review patient medications and reduce polypharmacy. As well as this, there are current proposals for 240 pharmacists and technicians to support appropriate prescribing and medicines use in care home residents. This work will not only reduce waste, but benefit the patients in terms of improved medication optimization and safety.

The key priorities

- Improved shared care between health and care professionals; with increased knowledge and support.

- Professional regulators must ensure adequate training in safe and effective medicines use is embedded in undergraduate training, and professional leadership bodies, working with professional regulators must ensure continuing professional development adequately reflects safe and effective medicines use too.

- Professional regulators and professional leadership bodies should also encourage reporting and learning from medication errors.

7. WHO Domain - Medicines

"Medicines are sometimes complex and can be puzzling in their names, or packaging and sometimes lack sufficient or clear information. Confusing 'lookalike sound alike' medicines names and/or labelling and packaging are frequent sources of error and medication-related harm that can be addressed." [WHO]

Labelling and Packaging

The SLWG acknowledged that the UK is making good progress in the area of labelling and packaging. There should be a concerted effort to share this expertise internationally as part of the Global Patient Safety Challenge. This would promote shared learning and help to drive global improvements in reducing medication error.

Despite progress, the SLWG recognised that the issue of colour and name differentiation in medication and its packaging could be problematic. It was suggested that more emphasis is needed on patients self-checking and challenging professionals on medication they are given, in both primary and secondary care settings. This links closely with the suggestion to empower patients with the necessary knowledge and confidence to be able to do this. Pharmacy dispensing computer system suppliers should also ensure that labelling is clear and in plain English. Guidance is available on how labelling is used in practice so that labels added at the point of dispensing do not obscure important information on packaging, and allow the most effective self-checking by patients.

Some patients may find it more difficult to check their medicines and may face barriers such as language or learning ability. Although these should not deter movements towards patients taking a more active role in their medication, these issues should be considered.

Feedback to regulators and manufacturers on design was important. The SLWG considered that collaborative working with the pharmaceutical industry to reduce frequent changes of packaging might be helpful as patients often rely on packaging to manage their medication. Therefore there may be scope for the pharmaceutical industry to play a greater role in testing packaging and products with users.

Drug differentiation

Minimising selection and dispensing errors is critical. The research on what works to reduce 'look alike sound alike' errors is still developing, so a range of initiatives to reduce the risk of selection errors should be considered and tested. Amongst other options, further considerations are being given to make patients and professionals more aware of errors, developing more robust checking of medication, and the use of barcode scanning to try and reduce incorrect selection. The work of [MHRA](#) has included highlighting some of the more recent drugs that have been confused and encouraging individuals to report such incidents in an effort to promote shared learning.

Key Priorities

- Work with industry and MHRA to produce more patient friendly packaging and labelling.

- Work with pharmacy dispensing computer system suppliers to ensure that labelling contributes to safer use of medicines and does not hinder, for example by labels being stuck over packaging or by using unfamiliar language.

- Build on work to identify and increase awareness of 'look alike sound alike' drugs and develop solutions to prevent these being introduced.

8. WHO Domain- Systems and Practice of medication

"Systems and practice of medication are complex and often dysfunctional, and can be made more resilient to risk and harm if they are well understood and designed". [WHO]

The SLWG identified two key themes in how to improve systems around medication: the use of hospital electronic prescribing and medicines administration (HePMA) in the inpatient setting, and systematic use of information in primary care.

Hospital E-prescribing and medicines administration - deployment and optimisation

The benefits of HePMA are now well documented and demonstrate, amongst other things, a significant reduction in medication related error, particularly when systems have been optimised after implementation. Even without optimisation, a recent National Institute for Health Research (NIHR) funded study has shown that high-risk medication errors can be reduced by up to 50%, as well as showing the system to be cost effective. Optimisation however remains a challenge. It is clear from work undertaken by NIHR, and the national digital e-prescribing and medicines administration (HePMA) maturity information, that there are significant challenges and delays with sites optimising systems once they have been implemented. This is leading to delays in benefits being realised as expected, particularly around medication safety, and system generated errors being missed.

HePMA systems are possibly one of the most challenging digital health systems to implement in provider organisations but the rewards more than outweigh this. Systems are technically complex. Successful implementation requires considerable change to working practices across three clinical professional groups (medicine, nursing and pharmacy). These challenges mean that implementing systems can take some time, typically 18 months to two years from conception to implementation.

The rollout of HePMA systems across the NHS remains low – figures from November 2017 show that only 35% of acute Trusts had rolled out systems (where greater than 80% of inpatients prescriptions are written digitally) and less than 12% of mental health organisations.

An ePrescribing toolkit is available to support sites looking to install and use HePMA as an output of the recently completed NIHR research that has been investigating implementation. The research has demonstrated that HePMA is a good first step for sites in their digital journey and that the learning they derive is applicable for other digital initiatives.

The Global Digital Exemplar (GDE) Programme will provide additional blueprints to support implementation and should resolve some of the current technical challenges around more advanced HePMA functionality. These will be available to the wider NHS over the next eighteen months to three years which is helpful, but the NHS should not wait to accelerate deployment.

International work has shown that using a simulation tool to run a series of tests identifying how well systems have been locally configured to avoid error can help sites to optimise more quickly than may otherwise have occurred.[2] Funding has been committed to developing an NHS

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[2] Metzger et al. Mixed Results In The Safety Performance of Computerized Physician Order Entry. Health Affairs 2010 29(4): 655-663

focussed tool specifically looking at the avoidance of medication errors to see if such an approach can deliver for the NHS. A research project is also being scoped to follow the NIHR work on implementation to understand why optimisation is not addressed in a timely manner so that we can understand how best to increase the rate at which benefits are realised.

In the context of robust evidence of clinical and cost effectiveness, the group considered that roll-out of HePMA must be accelerated. Implementation knowledge and support from the NIHR work, the GDE programme and other sites that have successfully implemented is available. The work to provide a simulation tool and enhanced knowledge has been initiated to provide a sound basis for supporting and reducing the time to optimisation when sites are ready for that part of their journey.

In addition to improving the implementation and optimisation of electronic prescribing and medicines administration in hospitals there is research to show that pharmacists can improve prescribing and monitoring in primary care by using technology to identify high risk prescribing practice in general practice. Research has tested if a pharmacist-led information technology intervention (PINCER) produced better results than simple feedback in minimising those at risk of higher risk prescribing and monitoring practices.

PINCER intervention

The PINCER intervention involves running searches on GP computer systems to identify patients at risk from hazardous prescribing. From here, pharmacists, trained in the PINCER approach, work with each general practice to develop an action plan to address the issues identified. Finally, pharmacists, working with and supporting general practice staff, will help implement the action plan.

Findings from the PINCER Trial, published in the Lancet, demonstrated that the PINCER intervention is an effective method for reducing a range of clinically important examples of hazardous prescribing in primary care.

PINCER has now been incorporated into national guidelines to support medicines optimisation by both NICE and NHS England, and since January 2015 there has been a large-scale roll-out across the East Midlands. Rollout has taken place in 361 GP practices (93% uptake) across 12 CCGs and it has identified 21,617 instances of hazardous prescribing in a patient population of just over 2.9 million people. A more detailed evaluation of this rollout has just commenced as part of a £2.43 million NIHR funded programme grant (PRoTeCT).

The computer queries used in the PINCER trial have been updated and made available to general practices in England through the Primary Care Information Services (PRIMIS) Query Library. Since its release in February 2013, the PINCER Query Library has been downloaded by 2,296 practices across 196 CCGs (approximately 30% of all practices in England) with potential benefits to thousands of patients, and the NHS, from this cost-effective intervention.

Key priorities

- The accelerated roll-out and optimisation of hospital e-prescribing and medicines administration systems.

- The roll-out of proven interventions in primary care such as PINCER.

9. Metrics

Transparency and measurement are key to learning and improvement. As part of the medication error programme a set of prescribing indicators is being developed by NHS Digital and NHS Business Services Authority (BSA) to reduce medication error and promote safer prescribing. The indicators will be published in a dashboard that will assess the current position and monitor progress. The aim is to reduce preventable admissions to hospitals associated with high risk prescribing or prescribing that increases the risk of harm. The purpose of the work therefore is to develop indicators that quantify prescribing practice that has a high or higher risk of harm and that is associated with admission to hospital due to that potential harm.

The indicators will be derived by the linkage of patient level and identifiable primary care prescribing data (available from BSA) with Hospital Episode Statistics (HES) data on admission/episodes of care (available from NHS Digital).

Indicators were selected based on available evidence and feasibility, and will be launched in phases. Phase 1 will include 5 indicators with a focus on gastrointestinal bleeds; as this is where the majority of evidence and research exists. Following phases will involve further development on a broader selection of indicators, as well as refinement of phase 1, to develop a more comprehensive overview. The SLWG advised on this programme, including the indicator development, and recommends this ground-breaking work continues to better understand and monitor higher risk prescribing.

Key priority

- The development of a prioritised and comprehensive suite of metrics on medication error aimed at improvement.

10. Good Practice Repository

The SLWG tasked the [NHS Specialist Pharmacy Service](#) to build an online repository, consisting of examples of good practice identified against WHO's domains and early action areas. Its purpose is to support the sharing of good practice across the NHS where that relates to the WHO Challenge. The repository is initially being built using examples gathered primarily via NHS England and NHS Improvement regional pharmacists.

An initial resource will be available later in 2018, and will provide examples of good practice which can be searched. The success of this resource will be assessed to inform future developments. Such developments may include online submission, assessment, and publication by practitioners. In addition, routes to enabling, spreading, and monitoring good practice through the Regional Medicines Optimisation Committees in England will be explored.

Key Priority

- Development of a repository of good practice to share learning.

11. Evidence Base Review

The Department commissioned a review of the available literature on medication error, to assess the extent and scale of the issue. The review was helpful to highlight that action should be taken, and will pave the way for future work in combatting the issues.

The review found that the scale of medication error was large and the burden to the NHS significant. Although the review relies on certain assumptions and estimates, the work was agreed by the SLWG to be the best possible based on the evidence available. The research underpinning the review still remains world leading in trying to identify and quantify medication error, as this field still requires more academic attention. The review will be published.

12.Research Priorities

As part of WHO's campaign to improve patient safety, WHO has invited research topics from around the world. The SLWG agreed it is important to ensure that medication error receives the attention it warrants, and that research is directed down the best avenue to facilitate positive change. Priority areas for research were considered by the SLWG and below are the recommended areas:

- Develop and test interventions to reduce avoidable hospital admissions due to medication.

- Develop and implement interventions to improve use of the most appropriate antimicrobial (or none) in acute infections in both primary and secondary care, aiming to optimise treatment of sepsis and minimise antimicrobial resistance.

- Enhance patient engagement and involvement in relation to medication, in both primary and secondary care.

- Build consistency in the definition and measurement of 'medication-related harm' so that progress can be tracked and comparisons made between studies.

- Develop and evaluate methods for providing feedback on medication-related errors with a view to improving patient safety.

- Develop and test interventions to make best use of technology such as clinical decision support, electronic prescribing and barcode verification, in both primary and secondary care, so as to optimise the potential benefits and to avoid or mitigate its unintended negative consequences.

- Explore how better use can be made of routinely collected electronic health data to identify and evaluate areas for intervention in relation to patient safety.

Key Priority

- New research on medication error should be encouraged and directed down the best avenue to facilitate positive change.

13. Governance and Ownership

The SLWG recommends a programme board is established to lead a programme of work to tackle medication safety and error. The board should have clear leadership and representative membership including clinicians, patients, and academics. There may also be a need for a sub group to manage the metrics aspects of the programme. The programme should be in line with domains and early priorities set out by WHO.

The SLWG also identified the importance of evaluating whether actions were having the required impact and suggested this could be done through NIHR Patient Safety Translational Research Centres at Manchester, Imperial, Leeds/ Bradford, and should include ongoing evaluation as the programme develops, as well as on its completion.

Key priority

- A programme on medication safety and error should be established, in line with the domains and high risk areas set out by WHO.

14. Summary of Recommendations

In summary, the SLWG recommended a programme on medication error and safety be established in line with the WHO domains. Early priorities should include:

- Improved shared decision making so that patients and carers are encouraged to ask questions about their medications and health and care professionals actively support patients and carers in making decisions jointly, including when to stop medication.

- Work closely with NHS Digital and others to improve information for patients and families, and improve access to inpatient medication information.

- Encourage and support patients and families to raise any concerns about their medication.

- Improved shared care between health and care professionals; with increased knowledge and support.

- Professional regulators must ensure adequate training in safe and effective medicines use is embedded in undergraduate training, and professional leadership bodies, working with professional regulators must ensure continuing professional development adequately reflects safe and effective medicines use too.

- Professional regulators and professional leadership bodies should also encourage reporting and learning from medication errors.

- Work with industry and MHRA to produce more patient friendly packaging and labelling.

- Work with pharmacy dispensing computer system suppliers to ensure that labelling contributes to safer use of medicines and does not hinder, for example by labels being stuck over packaging or by using unfamiliar language.

- Build on work to identify and increase awareness of 'look alike sound alike' drugs and develop solutions to prevent these being introduced.

- The accelerated roll-out and optimisation of hospital e-prescribing and medicines administration systems.

- The roll-out of proven interventions in primary care such as PINCER.

- The development of a prioritised and comprehensive suite of metrics on medication error aimed at improvement.

- Development of a repository of good practice to share learning.

- New research on medication error should be encouraged and directed down the best avenue to facilitate positive change.

- A programme on medication safety and error should be established, in line with the domains and early priorities set out by WHO.