Summary of Pharmaceutical Price Regulation Scheme/Medicines Optimisation National Roadshows

March - May 2015

Organised by the

Association of the British Pharmaceutical Industry, NHS England
and

15 Academic Health Science Networks

The Pharmaceutical Price Regulation Scheme (PPRS) and Medicines Optimisation
ensuring the right patients, get the right choice of medicine at the right time

NHS England INFORMATION READER BOX		
Directorate		
Medical	Commissioning Operations	Patients and Information
Nursing	Trans. & Corp. Ops.	Commissioning Strategy
Finance		

Publications Gateway Reference:	**4835**
Document Purpose	Report
Document Name	Summary of PPRS/MO National Roadshow Events
Author	International Science Writers
Publication Date	22 February 2016
Target Audience	CCG Clinical Leaders, CCG Accountable Officers, Academic Health Science Networks
Additional Circulation List	CSU Managing Directors
Description	The ABPI and NHS England, in collaboration with the 15 regional Academic Health Science Networks (AHSNs) held a series of 14 'Roadshows' in 2015. Each roadshow explained the mechanisms and context of the 'Pharmaceutical Price Regulation Scheme' (PPRS) and medicines optimisation in order to guide the formulation of strategic medicines optimisation action plans that could be implemented in each region across England.
Cross Reference	None
Superseded Docs (if applicable)	None
Action Required	None
Timing / Deadlines (if applicable)	**None**
Contact Details for further information	Joanne Coleman Office of the Chief Pharmaceutical Officer Skipton House 80 London Road SE1 6LH 0113 825 1419

Document Status

This is a controlled document. Whilst this document may be printed, the electronic version posted on the intranet is the controlled copy. Any printed copies of this document are not controlled. As a controlled document, this document should not be saved onto local or network drives but should always be accessed from the intranet.

The NHS Commissioning Board (NHS CB) was established on 1 October 2012 as an executive non-departmental public body. Since 1 April 2013, the NHS Commissioning Board has used the name NHS England for operational purposes.

Equality and Health Inequalities statement

Promoting equality and addressing health inequalities are at the heart of NHS England's/ our values. Throughout the development of the policies and processes cited in this document, we have:

- Given due regard to the need to eliminate discrimination, harassment and victimisation, to advance equality of opportunity, and to foster good relations between people who share a relevant protected characteristic (as cited under the Equality Act 2010) and those who do not share it; and

- Given regard to the need to reduce inequalities between patients in access to, and outcomes from healthcare services and to ensure services are provided in an integrated way where this might reduce health inequalities

Contents

Foreword from Dr Keith Ridge CBE

Over the course of the roadshows, over 1200 attendees from GPs to commissioners, pharmacists to providers, explored medicines optimisation and how, by working together, it is possible to improve outcomes for patients from their medicines, whilst increasing value for taxpayers from the their very considerable investment in medicines..

The roadshows also provided an ideal opportunity for us to learn from the people who attended. As a result, we have commissioned a report which aims to identify the areas where Medicines Optimisation can have the biggest impact. We hope the report, along with the excellent case studies from all over the country featured in this document, will give practical guidance to all healthcare professionals, commissioners and providers to help realise the benefits we know can result from adopting the medicines optimisation approach.

As we move in to the next stage of the Medicines Optimisation programme, we will be aligning it with NHS England's Right Care programme. Right Care aims to maximise value, both in terms of the value that an individual patient derives from their treatment and the value at population level that derives from investment in healthcare. Through this partnership, the Medicines Optimisation approach will become part of mainstream NHS practice. The opportunities of both programmes will be more easily realised and areas of inequality and variation identified and tackled more successfully. You can find out more about the Right Care Programme at www.rightcare.nhs.uk.

I would like to thank all those who took part in the roadshows for sharing with us their experiences of implementing Medicines Optimisation. We can only make a difference if we work together and these roadshows made a great start in facilitating relationships and partnerships that will ultimately see widespread improvements to patient outcomes.

Foreword from Alison Clough

Both the pharmaceutical industry and the NHS have a shared interest in ensuring that patients can access the most effective medicines possible to deliver the best health outcomes. The pharmaceutical industry supports the principles of medicines optimisation and ongoing initiatives that embed good clinical care for patients to receive the right choice of medicine that is appropriate for their needs.

In 2014 the Association of the British Pharmaceutical Industry (ABPI), on behalf of the biopharmaceutical sector in the UK, agreed an historic deal with the UK Government to underwrite the growth in the medicines bill. The scheme, known as the Pharmaceutical Price Regulation Scheme (PPRS) gives the Government, industry and the NHS certainty over its spending on the majority of the branded medicines bill, as an important part of the overall healthcare budget.

The industry agreed to do this to ensure that patients would still be able to access newer medicines despite the tough financial climate for the NHS. This PPRS is different from all previous schemes and in practice means that the pharmaceutical industry will be paying hundreds of millions of pounds back into the NHS this year and has paid back over £1.2 billion already in the first two years of the scheme.

It was on the basis of this shared interest and commitment that the ABPI and NHS England agreed to develop a programme of activity around the principles of medicines optimisation and support the NHS to understand the benefits of the PPRS. As part of this programme and run in partnership with the Academic Health Science Networks, 14 best practice roadshows were delivered across England. The roadshows focused on promoting the importance of a patient-centred approach to prescribing to ensure that patients are prescribed the most effective medicines for them.

What the roadshows made clear is that there are pockets of best practice and examples of excellence throughout the country. However, more needs to be done to help different CCGs and the AHSNs to work together and share these positive examples, and to encourage better communication between primary and secondary care. The pharmaceutical industry can and will play its part in helping to make this a reality.

The roadshows were also intended to help healthcare professionals understand the opportunity the PPRS and medicines optimisation provide to help create the headroom to prescribe the necessary medicines for their patients. Almost two years into the 2014 PPRS, people tell us that levels of understanding about the scheme are still low across the NHS and further discussions are needed to ensure full understanding of how to reap the benefits of the PPRS agreement locally.

The roadshows were just the start of this joint programme and we are committed to continuing with this work as it becomes incorporated into AHSN business plans and the NHS England *Right Care* Programme. As we move into the next stage and focus on engaging with patients, it is essential that the pharmaceutical industry, patients, and the NHS work together to fulfil the ambition of the PPRS and the principles of medicines optimisation, and maximise the benefits of both for patients.

Executive summary

The ABPI (Association of the British Pharmaceutical Industry) and NHS England, in collaboration with the 15 regional Academic Health Science Networks (AHSNs) held a series of 14 ‘Roadshows’ in 2015. Each roadshow explained the mechanisms and context of the ‘Pharmaceutical Price Regulation Scheme’ (PPRS) and medicines optimisation in order to guide the formulation of strategic medicines optimisation action plans that could be implemented in each region across England.

The PPRS/Medicines Optimisation programme goals are to:

- Help patients to improve their outcomes, including better monitoring and metrics
- Ensure patients have access to an evidence-based choice of medicine, including the newer innovative medicines
- Improve adherence and help patients to take their medicines correctly, ensuring patients are actively involved in decisions about their medicines,
- Avoid patients taking unnecessary medicines,
- Reduce wastage of medicines, and
- Improve medicines’ safety

Audiences at the roadshows consisted of representatives from the AHSNs, Clinical Commissioning Groups (CCGs), as well as clinical and community pharmacists. There were fewer numbers of clinicians, GPs finance professionals and patient representatives attending and therefore the outcomes of the roadshows were influenced primarily by the stakeholder groups present.

Sir Bruce Keogh, National Medical Director of the NHS delivered key messages on the national context of medicines optimisation, which included:

- Why medicines optimisation is vital for the safety, effectiveness and economy of UK patient care
- How appropriate use of innovative new medicines could help the UK to become the ‘go to place’ for new drugs, treatments and devices
- Why AHSNs are pivotal in guiding medicines optimisation programmes to ensure that new medicines and treatments reach UK patients more rapidly

A number of barriers to implementing medicines optimisation programmes were identified including lack of resources for scaling up programme of work from pilots, poor communication between primary care and secondary care settings, as well as limited communication between AHSNs and CCGs. Thirteen enablers of medicines optimisation identified included utilising the resources of both clinical and community pharmacists for prescribing and training patients, as well as increasing the number of Clinical Medication Reviews and Medicines Use Reviews (MURs) to reduce polypharmacy (using multiple medicines concurrently).

The case studies presented at the roadshows (Appendix 1) demonstrated that many medicines optimisation initiatives can often be performed by utilising and reorganising existing resources. Five of these case studies included economic health evaluation to not only show the direct monetary value of reducing the medicines burden, but also the estimated health and social care efficiency savings from the interventions. The remaining case studies did not include this type of data, and an action for future medicines optimisation programmes is to provide training and support so that outcomes data can be produced to measure return on investment and benefits to patients care and ensure resources are available for scaling up medicines optimisation programmes in each region.

A significant number of the case studies demonstrated the cultural and behavioural changes in the organising by recognising the need to introduce the most appropriate choice of medicine.
As not all medicines optimisation programmes currently include outcomes data, a taxonomy of criteria using the exemplar case studies has been constructed and includes the perceived benefits of each programme together with a colour coding to indicate of the ease of replication and implementation (Table 1). This table will help guide AHSNs and CCGs as to which programmes they could most readily begin in their region and could also be used as a tool for all future medicines optimisation planning.

Future work programmes for NHS England/ABPI and the AHSN network identified from the roadshows will continue through 2016 and 2017. These will focus on

engaging with patient groups to design communication programmes that provide patients with the information they need about their treatments, their health and self-care; disseminate national information and support materials relating to PPRS and medicines optimisation and provide information and guidance to providers and commissioners for planning medicines interventions (including health economic analysis).

The Roadshows have been part of a much wider programme of work, including a focus on addressing barriers locally and nationally with supporting projects by stakeholder groups including AHSNs, CCGs, patient groups and NHS England. Initiating and implementing these programmes will ensure that medicines optimisation becomes embedded into routine practice, allowing patients too safely and effective obtain the maximum benefit from their medicines.

1. Summary of roadshows

1.1 The national context

Medicines have a vital role to play – they prevent life threatening disease, manage long-term conditions, improve quality of life and reduce mortality. But there are many issues that prevent or reduce their effectiveness. These include patients reporting insufficient or complex supporting information, poor adherence, medicines' wastage, the complications of using many medicines concurrently (polypharmacy) and variable uptake of newer innovative medicines.

We also need to tackle the challenges of budget constraints facing the NHS and growing demand which comes from an ageing population with multi-morbidities that are taking multiple medicines. The number of prescribed medicines has increased by 50 percent in the past ten years. We need to find new, innovative ways to deliver services, ensure more value for money and to improve patient outcomes and quality from all medicines use.

As part of their commitment to tackling this challenge, the pharmaceutical industry has agreed to support the growth in branded medicines through direct payments to the Department of Health.[1] Under the five year voluntary 'Pharmaceutical Price Regulation Scheme' (PPRS) at the time of the roadshows the payment estimate for

2015/16 was £995 million (for the UK as a whole), £796m of which was centrally factored into NHS England's overall Mandate budget from the Department of Health and is part of the funding growth provided.

The PPRS agreement presents the NHS with a unique opportunity to ensure patients are getting the right medicines at the right time, less constrained by cost. It gives the NHS the flexibility to act based on the full long-term value of medicines which include reduced number of hospital admissions and readmissions and better overall health, rather than using short-term cost containment measures.

When the PPRS was agreed in 2014, the Secretary of State for Health asked that the ABPI (Association of the British Pharmaceutical Industry) and NHS England build on the opportunity of the PPRS agreement and work together, "to agree and carry through a solution for accelerating uptake of clinically and cost effective medicines."

As a result, NHS England and ABPI are developing a joint programme of work, guided by the principles of medicines optimisation - as set out by the Royal Pharmaceutical Society in 2013 in their report 'Medicines Optimisation: Helping patients to make the most of medicines'[2]. This approach looks beyond the cost of medicines to the value they deliver and recognises medicines as an investment in patient outcomes where patients are supported to take their medicines appropriately.

The PPRS/Medicines Optimisation programme goals are to:

- help patients to improve their outcomes, including better monitoring and metrics
- ensure patients have access to an evidence-based choice of medicine, including the newer innovative medicines
- improve adherence and help patients to take their medicines correctly, ensuring patients are actively involved in decisions about their medicines,
- avoid patients taking unnecessary medicines,
- reduce wastage of medicines, and
- improve medicines' safety

As part of this programme, the ABPI and NHS England, in collaboration with the 15 regional AHSNs (Academic Health Science Networks) held a series of 14 ‘Roadshows’ around England from March to May 2015.

1.2 The regional context

Between March and May 2015, the ABPI and NHS England in collaboration with the 15 Academic Health Science Networks (AHSNs) organised stakeholder events across England to discuss delivering improved patient outcomes through harnessing the opportunity of the Pharmaceutical Price Regulation Scheme (PPRS) and medicines optimisation. At a series of 14 national roadshows, each attended by approximately 80-150 delegates there were presentations on the PPRS and initiatives concerning medicines optimisation nationally. Additionally, AHSN, clinical network, patient and pharmacist representatives from across each region discussed local medicines optimisation initiatives. These presentations and discussions allowed interested parties the opportunity to understand and discuss the issues surrounding the PPRS, medicine optimisation and patient engagement. The events were organised to ensure NHS medical, pharmacy, commissioners, operations and finance staff, as well as patient representatives could gain a greater understanding of the concept of medicines optimisation and how this is supported by PPRS, and share knowledge of best practice in medicines optimisation. Each AHSN could then identify a local medicines optimisation action plan.

1.3 What’s working well?

Medicines optimisation is recognised by all parties at the roadshows as playing a key role in helping and supporting patients improve their outcomes by better use of their medicines, providing cost-efficiencies in the NHS and helping to increase the use of newer medicines, where appropriate.

The NHS will continue to raise awareness amongst healthcare professionals (HCPs) and patients that medicines optimisation is crucial to move to a more patient centric approach to prescribing and to safeguard patients.

The pharmaceutical industry, NHS and Department of Health wants to ensure that the 2014 PPRS agreement, running from 2014 to 2018, where industry has agreed to support the growth in the branded medicines bill, is recognised as a major enabler of medicines optimisation. It will help clinicians look beyond the cost of medicines and remove one of the major barriers to prescribing branded innovative new medicines if there is clear evidence that it will benefit the patient.

The national framework for PPRS/medicines optimisation will continue to be developed and the ABPI and NHS England set out the guiding principles and strategy for implementation of their joint programme. Part of this strategy is the development of NHS England's medicines optimisation dashboard, which will be reviewed and refreshed regularly. Additionally, the University of Keele has been commissioned to review current examples of best practice in medicines optimisation to assess for impact and to prioritise projects. These combined programmes of work are helping to guide Clinical Commissioning Groups (CCGs) to specific areas where local medicines optimisation initiatives could have the greatest impact.

At the local level, on-going programmes for improving medicines optimisation were presented by AHSN, pharmacists, clinical networks, academics and National Institute for Health and Care Excellence (NICE) representatives. These included initiatives to address common medicines optimisation issues such as, how to empower patients to understand why, when and how to take medicines; reducing inappropriate polypharmacy; better use of clinical and community pharmacists' resources; reducing prescribing errors and utilising IT tools. Each of the 15 AHSNs has initiated projects in collaboration with the NHS and industry and will continue to identify and support these types of initiatives locally.

1.4 Areas for development or change

Ten barriers were identified at the roadshows to implementing medicines optimisation initiatives and the most widely cited were:

- Insufficient resources such as funding and time
- Lack of interoperability and access to patient Summary Care Records by community pharmacists and other HCPs

- Poor integration and communication of medicines optimisation programmes with too much silo working of AHSNs, CCGs and HCPs.

1.5 Development and actions for the future

Stakeholders at the roadshows identified a number of key enablers for medicines optimisation as:

- Utilising clinical and community pharmacists' resources more effectively for Clinical Medication Reviews, Medicines Use Reviews (MURs), New Medicines Service (NMS) and patient training on use of high risk medicines such as inhalers, anti-coagulants and insulin
- Empowered patients and carers
- Standardised training to undertake additional services and interventions such as; spirometry and inhaler technique and identify inappropriate polypharmacy
- Access to Summary Care Records by community pharmacists and other HCPs

The barrier and enablers cited most were a function of the audience present and therefore a more detailed description of all those discussed is noted in Section 7.

To help support and measure the quality improvements from medicines optimisation programmes, delegates at the roadshows were presented with a list of themes for development within the Medicines Optimisation Dashboard. These included acute kidney injury, antibiotic resistance, cardiovascular disease, stroke prevention, and heart failure. Locally, participants at the roadshows were invited to send feedback on the dashboard via England.MODashboard@nhs.net.

From the roadshows, the key comments about the medicines optimisation dashboard identified by attendees for development were that it needs:

- *A mechanism in the dashboard to identify polypharmacy patients*
- *To have a data refresh more often than every six months*
- *To have some or all of the dashboard to be patient facing*
- *Clarity with some indicators to show if performance levels are good or poor.*

Attendees at the roadshows also raised issue around the PPRS which included:

- *How to communicate the benefits of this agreement with finance professionals*
- *Why devolution of the PPRS rebate to CCG level is not possible*
- *What rebates individual pharma companies outside the PPRS can offer as part of their own commercial models*
- *Clarification of specific exclusions from PPRS calculations.*

Further detail of the medicines optimisation dashboard can be found in Section 3

2. Roadshows key topics and discussion

2.1 A national perspective on medicines optimisation

NHS England views medicines optimisation as an essential method of ensuring patients can take their medicines safely and effectively. Commenting on this ***Sir Bruce Keogh, National Medical Director of the NHS*** said:

"[We have] the opportunity to turn our health care system into unequivocally the best one in the world…the aim of today is think about how we can more effectively use our medicines to make a massive contribution to the safety, effectiveness and economy of the care we offer to patients."

Sir Bruce went on to set out the NHS context of challenges and opportunities and made clear how the UK must build on its research and development (R&D) excellence and become the 'go to place' for new drugs, treatments and devices. He stressed the value of AHSNs as bodies that are based on natural geographies and bring together all the right players and emphasised their key role in making sure that new medicines and treatments reach patients more rapidly.

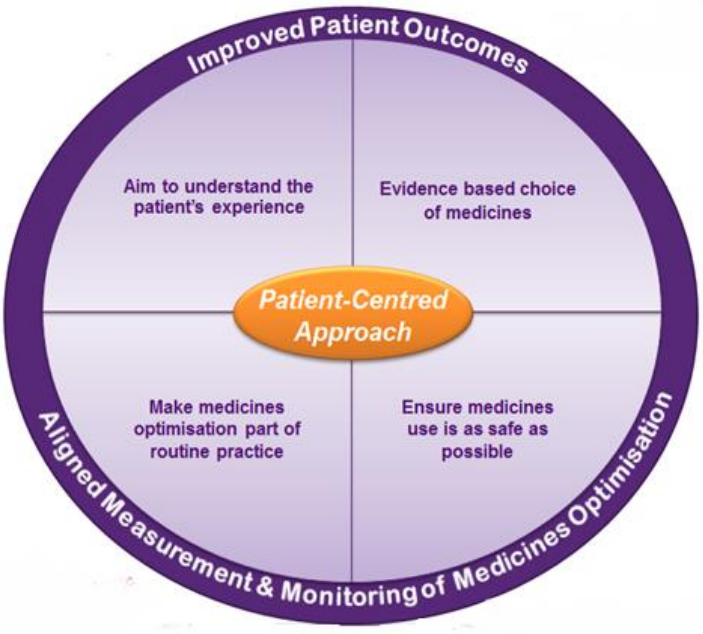
At different roadshows either, ***Dr Keith Ridge, Chief Pharmaceutical Officer, NHS England*** or ***Dr Bruce Warner, Deputy Chief Pharmaceutical Officer, NHS England*** introduced the issues and opportunities around medicine optimisation and the principles of the PPRS agreement. They made clear the value of medicines in preventing life-threatening diseases and improving the quality of life for people with long-term conditions. Reflecting this, medicines are the most commonly used

therapeutic intervention in the NHS; it spends £14.4 billion each year on them[3] - 15 percent of its annual budget. However, 30 – 50 percent of medicines are not taken as intended[4, 5] and in the primary care setting, this has contributed to an estimated £300 million per year spent on medicine wastage, with around a half of this being avoidable.

Currently, there is inadequate review and monitoring of medicines outcomes and wide variation in medicine use across England. Additionally, and partly because Clinical Medication Reviews and MURs [6] are often not performed regularly enough, polypharmacy (patients on five or more medicines[7]) has become common, especially in older patients. In England, these issues contribute to 5 - 8 percent of hospital admissions being due to preventable adverse drug reactions.[8, 9]

To help improve patient outcomes, quality and value from medicine use, innovative new ways to deliver services to patients are needed. Developed in collaboration with patients, the NHS and the pharmaceutical industry, the Royal Pharmaceutical Society published guidance on medicines optimisation in 2013[2], focused on seven principles and a patient centred approach as set out in Figure 1.

Figure 1: A Patient Centred Approach to Medicines Optimisation



Keith Ridge summarised, by saying: *"We need to move on from the low hanging fruit of medicines management to medicines optimisation, where we think about medicines as an investment. With the Five Year Forward View[10], medicines will need to be put in context of the seven principles of medicines optimisation, which will look beyond the cost to the value they deliver to patients. Using the medicines optimisation principles requires a significant change in practice for prescribers but ultimately it will lead to a reduction in medicines' wastage, as well as improved outcomes and safety for patients."*

NHS England and the ABPI are developing a joint programme of work for medicines optimisation, which takes forward this approach and looks beyond the cost of medicines to the value they deliver.

National Institute for Health and Care Excellence (NICE) Medicines Optimisation guidelines published in March 2015,[11] also set out what needs to be done by all health and social care practitioners and organisations to put in place the person-centred systems and processes that are needed. Dr Ridge concluded by introducing the PPRS agreement[1], which he explained, presents a unique opportunity to ensure that patients are getting the right medicines at the right time, less constrained by cost.

2.2 Medicines optimisation – the patient's perspective and what it means in practice

At some of the roadshows delegates were shown a compelling and emotive video featuring a patient who suffered kidney failure due to drug interactions. She explained how medicines optimisation in practice could have helped her and stated: *"Taking medicines correctly is ultimately the patient's responsibility but without expert guidance we can't do that. Often in your care there are so many people involved and they all tell you different things about your medication that it is easy to become confused by it all. I was often brushed off and I had to battle with the people giving me my medication."*

This led to her taking three different drugs which interacted to cause kidney failure and hospital admission. She said: *"If there had been more interaction between my doctors, community pharmacists and hospital there might have been a better outcome. The best way to impact care is to communicate, no medicine should be given that interacts and causes damage like it has to me."*

Patient representatives across all the roadshows nationally said that they wanted to be listened to and to be empowered to understand how to take their medicines correctly. One patient stated: "*medicine use needs to be optimised to give the right outcomes and benefits to patients. If best practice and best value are combined in the NHS this will be very powerful and will ensure the latest drugs are delivered in the right combinations. Patients do have a voice and the cost of new medicines can be high but the cost of not using them can be even higher."*

Patients at the roadshows believed that a fresh approach is needed where they are involved at population, community and individual level and all the aspects of progress are robustly measured to:

- Understand what matters to patients by involving them
- Design quality into the services provided
- Help people project manage their care
- Support and encourage continual improvement

One patient did note that incidences of good care can make a big difference notably when one consultant took responsibility for reviewing all of her father's treatments and spent 40 minutes going through their pros and cons and deciding what to do together. She added that good interactions with community pharmacists had also been very helpful and listed six points that could make a difference as follows:

- Meaningful conversation on conditions and the options for treating them;
- Clear guidance on how to use and get the best from medicines;
- Synchronisation of repeat prescriptions the norm;
- Proper annual medical reviews – these can lead to deprescribing or lower doses;

- Supporting patients without patronising them; and
- Better communicating the rich medical understanding in the NHS to patients.

She concluded: *"Help us to understand [medicines and options] so that we can have a meaningful conversation. Patients are not the enemy! We can work together and it will make your jobs easier*."

One patient continued with this theme and summarised the feeling of many patients by adding: "*My message to HCPs is that if you are talking to patients with long-term conditions; ask how they feel and if they have had any reactions to their medicines. Taking medicines is voluntary; please communicate with the patient until they understand what is happening*."

2.3 Partnership with industry

At different roadshows nationally either***, Jonathan Emms, past ABPI President, Carol Blount, formerly NHS Partnership Director at ABPI, Alison Clough, Acting CEO at ABPI, Harriet Lewis, Regional Partnership Manager (North) at the ABPI,*** or ***David Watson, Director Pricing and Reimbursement for the ABPI*** explained the PPRS for 2014-2018 and how it aligns with and enables medicines optimisation. Recognising the financial challenges facing the NHS and that the UK is a 'low and slow' user of newer, more innovative medicines, the ABPI negotiated a five year agreement with the Department of Health. Under the PPRS agreement industry has committed to underwrite growth in the branded medicines bill and refunds to the Department of Health spend in excess of the agreement. At the time of the roadshows, repayments for 2015/16 were expected to be approximately £800m and estimated to be a total of around £3.5 billion over the duration of the five-year scheme. Industry representatives said that the scheme is a one off opportunity, reflecting the climate of austerity, with benefits for all the key stakeholders. The intention was for it to enable:

- **Patients and clinicians** to use branded medicines, based on clinical factors not cost;

- **NHS** commissioners to remove barriers to clinicians choosing which medicines to use;

- **Industry** to have stability, whilst also supporting innovative companies and accepting a level of risk driven by austerity issues; and

- **The Government and the taxpayer** to have a predictable branded medicines bill.

Alison Clough said: *"In the past, the PPRS has featured price cuts on the cost of branded medicines but this didn't benefit the NHS because it had little control on spending limits. With the new PPRS, there is a cap on the bill of 93 percent of branded medicines. The intention of the PPRS is to remove some of the affordability challenges of prescribing innovative medicines and allow the use of the right medicines, with less cost constraints, which will lead to better outcomes for patients."*

At the request of the Secretary of State, the ABPI and NHS England are working together to accelerate the uptake of clinically and cost effective medicines and hence maximise the benefits of the PPRS. The joint PPRS/Medicines Optimisation programme is a core component of the work and involves working in partnership with national and local stakeholders to raise awareness and understanding of the PPRS; communicate the importance of medicines optimisation to healthcare professionals; share best practice examples; and to understand and overcome any barriers that exist. The pharmaceutical industry sees medicines optimisation as looking beyond the cost of medicines in isolation to the value they deliver as an investment in patient outcomes.

The joint PPRS/Medicines Optimisation work programme is led by a joint steering group and includes raising awareness the concept of medicines optimisation, the value, use and understanding of the PPRS, strategic communication plans, a medicines optimisation patient panel, and further developing the Medicines Optimisation dashboard. The key outcome of the roadshow is to have a local Medicines Optimisation action plan in place for each AHSN.

2.4 Barriers to utilising the PPRS for medicines optimisation

Delegates at the roadshows raised the question as to why the reimbursement of PPRS payments was not ring-fenced to a specific medicines budget at CCG level. NHS England has clarified that the forecast £796m of industry payments is included in NHS England's baseline budget for 2015/16. Without this funding, allocations to CCGs and other commissioners would be lower. The opportunity is there through the PPRS agreement to accelerate the uptake of clinically and cost effective medicines at a national level although there were frustrations expressed at the visibility of this at local level. Further discussions are needed to ensure full understanding of how to reap the benefits of the PPRS agreement locally.

Other issues raised at the roadshows nationally were what the PPRS contributions cover, for example do they include VAT, stockpiles and distribution costs. Additionally delegates wanted to know what benefits companies not signed up to the PPRS can provide the NHS in terms of discounts. A better understanding of how the PPRS benefits prescribers and NHS financial staff with case studies that address finance issues need to be developed in future. This is now being done through AHSN work programmes.

Ridge concluded: "*The PPRS creates a unique opportunity to refocus medicine use on value rather than cost containment. PPRS payments have been factored into the additional funding for NHS England and are going to make a significant contribution to NHS basic funding over the next five years.*"

3. Measuring the impact of medicines optimisation interventions

3.1 The Medicines Optimisation Dashboard

Jonathan Fox, Medicines Optimisation Programme Lead at NHS England, gave an update presentation on the Medicines Optimisation Dashboard project.

The prototype Medicines Optimisation Dashboard[12] was launched in June 2014 and brought together data from NHS England and wider stakeholders for the first time,

including for all 211 CCGs in England. It is primarily aimed at CCGs and Trusts, but AHSNs are part of its wider audience. It enables access to 30 different metrics such as medicine safety, prescribing comparators, Medicine Use Reviews, and uptake of NICE approved new medicines. Dashboard data will be refreshed every six months and the addition of new metrics will be reviewed annually.

By showing variation across England, the Dashboard allows CCGs to benchmark where they are in relation to others. This can help to inform and improve the use of medicines and guide AHSNs as to where resources are required for specific local medicines optimisation programmes.

Jonathan Fox said: *"The medicines optimisation dashboard shines a light on variation across CCGs and is an indication of how well patients are supported. It can be used by CCGs or AHSNs as a tool for evidence based decisions, guiding and measuring the success of medicines optimisation initiatives."*

Initial evaluation results (by Keele University) show that the majority of CCGs feel that the Dashboard is useful. The final evaluation will inform future work, and themes already identified for development include polypharmacy, mental health, diabetes, stroke prevention, chronic obstructive pulmonary disease, cancer, heart failure and hypertension.

3.2 Review of medicines optimisation data

At many of the roadshows delegates were asked to analyse local Medicines Optimisation Dashboard data and provide feedback. Many expressed the opinion that the dashboard could provide good guidance on where to put resources into medicines optimisation programmes, focusing on:

- ***Uptake of the electronic Prescriptions Services (EPS) and repeat dispensing prescriptions***
- ***The number of MURs and referrals to the New Medicines Service (NMS) [13, 14] being performed.***
- ***Access to audit tools such as GRASP-AF and PINCER***

From the roadshows, some delegates commented that the data in the database used Quality and Outcomes Framework (QOF) [15] indicators and may not reflect an accurate overview of their region. The other key comments about the medicines optimisation dashboard identified by attendees are that it needs:

- ***A mechanism in the dashboard to identify polypharmacy patients***
- ***A data refresh more frequently than every six months***
- ***To make some or all of the dashboard patient facing***
- ***Clarity with some indicators to show if performance levels are good or poor.***

These issues will be taken into consideration for future iterations of the medicines optimisation dashboard and some for example, a data refresh more frequently than every six months, have already been implemented.

4. Local medicines optimisation programmes

At the roadshows, themes which included empowering patients, reducing inappropriate polypharmacy, utilising pharmacists' resources, use of IT tools and reducing prescribing errors ran through the local medicines optimisation programmes. Twenty case studies are included in this report and many demonstrated that medicines optimisation initiatives can often be performed by utilising and reorganising existing resources. Detailed information on these are listed in Appendix 1.

Four of these case studies, the Diabetes Medicines Use Review Toolkit[16], the MOTIVE Initiative and two projects to reduce polypharmacy at NHS Greater Huddersfield CCG/ NHS North Kirklees CCG and Surrey Downs CCG all included health economic outcomes data as part of the evaluation of the intervention. These case studies not only showed the direct monetary value of reducing the medicines burden, but also the estimated health and social care cost savings as part of their success criteria. The remaining case studies did not include this type of data, and an action for the future is to provide training and support so that economic modelling

can be produced to measure return on investment and ensure that the resources are available for scaling up medicines optimisation programmes.

A significant number of the case studies demonstrated the cultural and behavioural changes in the organising by recognising the need to introduce the most appropriate choice of medicine. The projects were designed to improve the quality of care for patients, with a move away from delivering efficiency savings as the aim.

As not all medicines optimisation projects included economic health data, to determine the value of the case studies presented, a taxonomy of criteria has been constructed as indicators of benefit. The criteria are extrapolated from the core principles of medicines optimisation and the PPRS and includes the perceived benefits of the programme and an indication of the ease of replication and implementation (Table 1). This table is colour coded to help guide AHSNs as to which programmes they could most readily begin in their region and could also be used as a tool for all future medicines optimisation planning.

Table 1: Potential benefits of medicines optimisation case studies from 14 national roadshows

Case studies in pink have been recently added to chart – not yet discussed with case study owner
Outcome/benefits assessment of all other case studies have been sent to case study owners

Blue (1) - can be replicated and implemented with minimal requirements,
Orange (2) - can be replicated and implemented with some moderate additional requirements
Purple (3) - can be replicated and implemented with some significant requirements and IT infrastructure

*STOPP: Screening Tool of Older People's potentially inappropriate Prescriptions ||START: Screening Tool to Alert doctors to Right i.e. appropriate, indicated Treatments.
[Gallagher P, Ryan C, Byrne S, Kennedy J, O'Mahony D. STOPP (Screening Tool of Older Persons' Prescriptions) and START (Screening Tool to Alert Doctors to Right Treatment): onsensus Validation. Int J Clin Pharmacol Ther 2008; 46(2): 72 – 83. PMID 18218287]

	Name	CCG/AHSN/org	Nature of intervention	Potential benefits/outcomes from MO interventions											Requirements for replication (All include appropriate training and utilisation of national Medicines Optimisation dashboard)
				Improving patient care and experience				Evidence based choice of medicines		Ensuring medicine use is a safe as possible		Making medicines optimisation part of routine practice			
				patient empowerment/ shared decision-making	Improved communication at interface & cross sector working	Improved adherence	Improved self-care	Appropriate choice of medicines	Adoption of NICE/innovation/national guidelines	Reduction in potential patient harm	Reduction in early re-admissions	Efficient use of resources	Improved prescribing and consultation skills	Improved use of workforce skills	
Empowering patients	*Eczema Expert*	Bridgewater Community Trust	3 step educational and product based plan for management of eczema by parents.	x		x	x	x				x		x	• Product costs, kit packaging and management
	My Medication Passport	Chelsea & Westminster Hospitals with NIHR (supported by Pharma Industry)	Paper based and smartphone app for recording personalised medication information	x	x					x		x			• Investment costs for app
	Florence tele-health reminder system	Mansfield and Ashfield CCG	Telephone reminder messaging system (text and landline messages)	x		x	x			x	x	x			• Use of existing NHS telephone messaging services • Supporting video http://www.health.org.uk/flo
	Diabetes MUR toolkit	Devon LPC	Two stage community pharmacy intervention, detailed MUR with additional follow up review	x		x	x		x	x		x	x	x	• Clinical skills training for community pharmacists

	Name	CCG/AHSN/org	Nature of intervention	Potential benefits/outcomes from MO interventions											Requirements for replication (All include appropriate training and utilisation of national Medicines Optimisation dashboard)
				Improving patient care and experience				Evidence based choice of medicines		Ensuring medicine use is a safe as possible		Making medicines optimisation part of routine practice			
				patient empowerment/ shared decision-making	Improved communication at interface & cross sector working	Improved adherence	Improved self-care	Appropriate choice of medicines	Adoption of NICE/innovation/national guidelines	Reduction in potential patient harm	Reduction in early re-admissions	Efficient use of resources	Improved prescribing and consultation skills	Improved use of workforce skills	
Reducing inappropriate polypharmacy	Polypharmacy intervention for high risk patients	Greater Huddersfield & North Kirklees CCGs	Adoption of validated clinical review criteria for specific group of patients on high risk medicines.	X	X	X		X	X	X		X	X	X	• Clinical skills training • Including use of STOPP/START* tool • Understanding of PPRS
	The MOTIVE initiative	Isle of Wight NHS Trust	Clinical medication review of patients referred from Social Services following discharge from hospital	X	X	X		X	X	X	X	X	X	X	• Referral protocol • Clinical skills training • Feedback pathway • understanding of PPRS
	Refer to pharmacy Webstar Health ®e-referral system	East Lancs Hospital NHS Trust	Electronic communication link between acute trust to patient nominated community pharmacy post discharge		X			X	X	X	X		X		• IT infrastructure/ licence • Interface referral protocol • Follow up procedures
	Medicines reconciliation with Non-Medical Prescribers	Chesterfield Royal Hospital NHS Trust	Pharmacists and nurse prescribers undertaking meds rec for specific categories of patients within 24 hrs of admission, Inc. frail elderly, anticoagulation		X					X	X		X	X	• Organisational support & funding for expansion of non-medical prescriber programme

	Name	CCG/AHSN/org	Nature of intervention	Potential benefits/outcomes from MO interventions											Requirements for replication (All include appropriate training and utilisation of national Medicines Optimisation dashboard)
				Improving patient care and experience				Evidence based choice of medicines		Ensuring medicine use is a safe as possible		Making medicines optimisation part of routine practice			
				patient empowerment/ shared decision-making	Improved communication at interface & cross sector working	Improved adherence	Improved self-care	Appropriate choice of medicines	Adoption of NICE/innovation /national guidelines	Reduction in potential patient harm	Reduction in early re-admissions	Efficient use of resources	Improved prescribing and consultation skills	Improved use of workforce skills	
Reducing inappropriate polypharmacy	Clinical MUR service in care homes	Surry Downs CCG	Pharmacist-led clinically focused MUR in care homes		X	X		X	X	X	X	X	X	X	• Clinical skills training for community pharmacists • Referral & feedback protocol
	STOPIT – the **S**creening **T**ool for **O**lder **P**eoples potentially **I**nappropriate **T**reatment	NIHR CLAHRC North West London	Tool developed for use by Doctors and Pharmacists for use across NHS Healthcare Trust sites to review selected 'at risk' patients over age 70.		X			X	X	X	X	X	X	X	• Training programme for junior doctors to use tool and learn from interventions
	ICE hospital admittance avoidance service	Intermediate Care Ealing (ICE)	Integration of clinical pharmacist for medication review during ward rounds or domiciliary visits	X	X	X	X	X		X	X	X		X	• Referral protocol • Clinical skills training • Feedback pathway • understanding of PPRS
	Medication and Patient Review Service *(MPRS)*	Norwich CCG	Utilisation of pharmacy technician to identify patients in care homes in need of review by GP and pharmacist simultaneously in GP practice prior to visit to care home					X	X	X	X	X	X	X	• Referral protocol • Feedback pathway • Practice capacity to respond to interventions

	Name	CCG/AHSN/org	Nature of intervention	Potential benefits/outcomes from MO interventions											Requirements for replication (All include appropriate training and utilisation of national Medicines Optimisation dashboard)
				Improving patient care and experience				Evidence based choice of medicines		Ensuring medicine use is a safe as possible		Making medicines optimisation part of routine practice			
				patient empowerment/ shared decision-making	Improved communication at interface & cross sector working	Improved adherence	Improved self-care	Appropriate choice of medicines	Adoption of NICE/innovation /national guidelines	Reduction in potential patient harm	Reduction in early re-admissions	Efficient use of resources	Improved prescribing and consultation skills	Improved use of workforce skills	
Use of IT tools/innovative technology	Utilisation of GP audit tools (PRIMIS)	University of Nottingham	Training and support provided to GP practices to encourage greater use of range of audit tools	X				X	X	X			X	X	• Practice capacity to make interventions following analysis of results
	Don't wait to anticoagulate joint working initiative	West of England AHSN	AF audit & clinical review process including shared decision-making process to agree treatment , and patient support website	X		X		X	X	X			X	X	• Capacity & funding to implement • Understanding of PPRS • Access to tools and support http://www.dontwaittoanticoagulate.com/
	Pharma-Outcomes® system	Newcastle-upon-Tyne NHS Trust	Web-based tool to transfer information across the interface with data collection to assess likelihood of re-admissions		X			X	X	X	X		X		• IT infrastructure/ licence • Interface referral protocol • Follow up procedures
	OptiMed unit dose laboratory	University Hospitals of Leicester NHS Trust	Ward based automated medication dispensing system			X				X		X		X	• Procurement of equipment • Staff training to use equipment

	Name	CCG/AHSN/org	Nature of intervention	Potential benefits/outcomes from MO interventions											Requirements for replication (All include appropriate training and utilisation of national Medicines Optimisation dashboard)
				Improving patient care and experience				Evidence based choice of medicines		Ensuring medicine use is a safe as possible		Making medicines optimisation part of routine practice			
				patient empowerment/ shared decision-making	Improved communication at interface & cross sector working	Improved adherence	Improved self-care	Appropriate choice of medicines	Adoption of NICE/innovation /national guidelines	Reduction in potential patient harm	Reduction in re-admissions	Efficient use of resources	Improved prescribing and consultation skills	Improved use of workforce skills	
Prescribing	*HARMs* - Hospital Admissions Related to Medicines	NHS Arden and Greater East Midlands CSU	Medication review undertaken by GPs for targeted patients over 65 years old taking specific medicines to reduce avoidable hospital admissions			X		X	X	X	X	X	X		• Practice capacity to make interventions following analysis of results • Platform for sharing practice • Incentive
	Mission – **M**odern **I**nnovative **S**olution**S** to **I**mprove **O**utcomes i**N** severe asthma	Wessex Clinical Research Network	Targeted comprehensive, multidisciplinary assessment and review for patients with severe asthma	X	X	X	X	X	X		X	X		X	• Practice capacity to make interventions following analysis of results • Multidisciplinary approach
	PINCER tool	University of Nottingham	Pharmacist-led IT intervention for reducing common prescribing errors	X				X	X	X			X	X	• Pharmacists' skills to use tool and interpret results • STOPP/START* criteria • Understanding of PPRS
	EPIFFany – Effective prescribing insight for the future	University Hospitals of Leicester	Education intervention for junior doctors using simulated ward-rounds, face to face feedback		X			X	X	X			X	X	• IT infrastructure/ licence • Capacity and funding to deliver • Understanding of PPRS

5. Future planning, actions and next steps

5.1 Identifying barriers

The roadshows identified ten barriers to implementing medicines optimisation programmes. Listed in order of frequency that these were mentioned, they included:

- Insufficient resources such as funding and time
- Lack of interoperability and access to patient Summary Care Records by community pharmacists and other HCPs
- Poor integration and communication of medicines optimisation programmes with too much silo working of AHSNs, CCGs and HCPs.
- Not enough education or contractual levers in place to encourage local medicines optimisation initiatives with community pharmacists and GPs
- Lack of support from GPs and the pharma industry of medicines optimisation programmes
- Insufficient numbers of HCPs trained in the use of audit tools to identify high risk patients
- No national standardisation of the MUR or NMS
- Not wide enough uptake of e-prescribing, automatic repeat prescribing, MURs and the NMS service.

The top three barriers listed, were overwhelmingly cited at the roadshows nationally as being major barriers.

5.2 Overcoming barriers

To overcome the lack of time and resources issue, many delegates at the roadshows suggested non-medical prescribers including community pharmacists, clinical pharmacists both in hospitals, GP surgeries and the community need to be utilised more effectively to enable patients to take their medicines correctly and to become experts in their own healthcare, with inappropriate polypharmacy, the use of inhalers and anticoagulants being priorities. To secure funding for medicines' optimisation programmes, it was suggested that health economics modelling including estimated savings on health and social care costs could help provide a rationale for projects.

Additionally, delegates commented that access to the Summary Care Record needs improvement for community pharmacists and a process should be put in place to inform community pharmacies post-hospital discharge, to flag up patients at risk of inappropriate polypharmacy or those taking high-risk or new medicines that may need additional support.

To resolve the communications and integration issues, additional medicines optimisation both patient and HCP advocates, education programmes and workshops that bring together diverse stakeholders are required to build cross-disciplinary medicines optimisation networks.

5.3 Enablers

Stakeholders at the roadshows identified key enablers of medicines optimisation. Listed in order of frequency that these were mentioned, they included:

- Utilising clinical and community pharmacists' resources more effectively for Clinical Medication Reviews, MUR, NMS and patient training on use of high risk medicines such as inhalers, anti-coagulants and insulin
- Empowered patients and carers
- Standardised training to undertake additional services and interventions such as; spirometry and inhaler technique and identify inappropriate polypharmacy
- Full visibility of the patient journey visibility with access to Summary Care Records by community pharmacists and other HCPs
- Integrated multi-disciplinary care teams to treat patients with long-term conditions and provide lifestyle advice
- HCPs trained in the use of audit tools
- Community pharmacists incentivised to undertake NMS and MURs
- Health economics data on estimated health and social care cost savings to support medicines programmes
- Identifying the correct stakeholders and getting them involved from the outset
- A medicines optimisation dashboard with up-to-date data
- Industry involvement

The top four enablers listed above were frequently cited at the roadshows nationally as being the main catalysts of medicines optimisation.

The barriers and enablers cited were related to the audience present at the roadshows, and may not represent the views of all stakeholders involved in medicines optimisation. Therefore, all of the barrier and enablers identified (Table 2) will be used as a guide for mapping different priority areas to specific stakeholder groups to enable planning of future activities.

Table 2: Barriers and enablers identified at 14 national roadshows

Table 2/category	Barriers to implementation identified at roadshows	Enablers identified at Roadshows
Empowering patients		Empowered patients and carers
National communications and awareness of PPRS/MO	Limited understanding of the benefits to patients and NHS associated with PPRS agreement and industry repayments	Identifying and communicating with the correct stakeholders and getting them involved from the outset
	Lack of awareness of benefits of interventions and programmes within GP practices & CCGs	
Business planning	Insufficient resources to implement and sustain initiatives, such as funding and time	Health economics data on estimated health and social care cost savings to support medicines programmes
	Insufficient awareness of business case and project evaluation requirements	Industry involvement to support business case development
		Utilisation of the medicines optimisation dashboard with up-to-date data to inform business plans
IT infrastructure / Safe transfer of care	Lack of interoperability and access to patient Summary Care Records (SCR) by community pharmacists and other HCPs	Full visibility of the patient journey visibility with access to Summary Care Records by community pharmacists and other HCPs
	Poor integration and communication of medicines optimisation programmes across interfaces and health economies with too much silo working of AHSNs, CCGs and HCPs.	
Education and training/workforce development	Access to appropriate clinical and consultation skills education programmes	Utilising clinical and community pharmacists' resources more effectively for MUR, NMS and patient training on use of high risk medicines such as inhalers, anti-coagulants and insulin
	Insufficient numbers of HCPs trained in the use of audit tools to identify high risk patients	Accredited training to perform a standardised MURs and NMS, provide correct spirometry and inhaler technique and identify inappropriate polypharmacy
		HCPs trained in the use of audit tools
National and local contracts/ service specifications & tools	Insufficient levers and incentives in place to encourage local medicines optimisation initiatives	Community pharmacists incentivised to undertake NMS /MURs
	No national standardisation of the MUR or NMS	Sharing of templates and tools
Behaviours and organisational culture	Insufficient uptake of enabling systems and processes such as e-prescribing, automatic repeat prescribing, MURs/NMS service.	Visible and well communicated leadership from CCGs, Trusts and AHSN
		Integrated multi-disciplinary care teams to treat patients with long-term conditions and provide lifestyle advice

6. Priority actions including regional and national plans

A number of actions were discussed at the roadshows for medicines optimisation and attendees formulated a list of priorities, which included:

- Increasing the uptake of MURs and NMS referrals in community pharmacies
- Developing training of clinical and community pharmacists to enable patient counselling and guided conversations on inhaler, insulin and anticoagulant use
- Supporting patients taking high-risk medicines with patient education events
- Reducing inappropriate polypharmacy of older patients with standardised MURs
- Improving communication channels between primary and secondary care and better access to the Summary Care Record by community pharmacists

Future medicines optimisation work programmes for NHS England/ABPI identified from the roadshows will continue through 2016 and 2017. These will focus on engaging with patient groups to design communication programmes that provide patients with the information they need about their treatments, their health and self-care; disseminate national information and support materials relating to PPRS and medicines optimisation and providing information and guidance to providers and commissioners for planning medicines interventions (including health economic analysis).

These are part of a much wider national and local programmes of works in which different barriers should be being addressed with supporting projects.

In the wider context of the different audiences present at the roadshows, medicines optimisation initiatives for each of the eight stakeholder group including AHSNs, CCGs, patient groups industry and NHS England need to be initiated and implementing these programmes will ensure that medicines optimisation becomes embedded into routine practice.

Keith Ridge summarised the key messages from all the roadshows, by stating: "*With the Five Year Forward View, medicines will need to be put in context of the seven principles of medicines optimisation, and to ensure it is not simply medicines management renamed. This is a significant cultural change in which clinical and community pharmacists will be redeployed and have a greater role to play. At the roadshows, we have seen a list of critical tasks being discussed and I would ask AHSNs to maximise resources and build in the infrastructure in order to get the next steps right. To deliver medicines optimisation, everyone needs to keep patient experience and their goals at the forefront of their mind and to value them; this will ensure patients are safely getting the best outcome from their medicines*."

Report compiled by Dr Sue Pearson, Director, International Science Writer.
Web: www.internationalsciencewriter.com Twitter: @isciencewriter

For further information and discussion about the report, please contact:

Aileen Thompson, Executive Director of Communications, ABPI.
Email: AThompson@abpi.org.uk

Harriet Lewis MRPharmS, NHS Partnership Manage (North), Medicines Optimisation Lead
Email: HLewis@abpi.org.uk

Joanne Coleman, Business Manager (Office of the Chief Professional Officers - Pharmacy), NHS England
Email: joanne.coleman6@nhs.net

7. Appendices - A summary of case studies presented at the national roadshows

7.1 Empowering patients

A number of regions have put in place medicines optimisation initiatives which enable patients to understand why, when and how to take medicines and also look at ways to improve their lifestyle. Good example of these presented at local events were, the 'My medication passport' in London, the telehealth system, Florence in use in Nottingham and the 'Diabetes Medicines Use Review Toolkit' in Devon.

7.1.1 The 'My Medication Passport'

An initiative called 'My Medication Passport' is a passport-sized booklet, designed by patients for patients to record details about their medicines.[17] It was trialled for 12 months with 200 patients in secondary care with the initial users being older people discharged home after an admission to one of the four North West London participating Trusts.[18]

Barry Jubraj, Honorary Associate Professor, Chelsea and Westminster Hospital NHS Foundation Trust, explained: "*More than half the users of the 'My Medication Passport' found it useful and one third carry it with them all the time. Following this trial, in 2014 the 'My Medication Passport' in paper and phone app versions have been made available to patients across North West London."*

A patient user of the 'My Medication Passport' stated: "*The 'My Medication Passport' provides a quick snapshot of useful information and encourages a rich reciprocal relationship between you and your HCP."*

7.1.2 The telehealth system, Florence

The East Midlands CCG assessed assistive technologies in conjunction with patients and clinicians and decided that a telehealth system called Florence[19] or Flo for short

might be a possible solution. This contacts patients by landline or mobile phone via text to provide reminders to take specific actions in relation to their health.

Sian Clark, AT Innovation and Operational Manager, Mansfield and Ashfield CCG stated: "*We originally looked at rolling this out to 600 patients but as of April 2015, it has been so popular we now have 2,000 users. It is used by patients and interacts with them to remind them at specific times to, for example, use their inhaler or take their medicine from their blister packs and not to forget the one in the fridge*."

Data from use of the Flo system is being evaluated to provide evidence of improvement in patient care outcomes and the results of this analysis will be made available later in 2015.

A diabetic patient champion who has used Flo since 2013 to get text reminders stated: "*I was diagnosed with diabetes at 16 and over the next six years I was admitted to hospital around 190 times because I was not controlling my diabetes. Since I have been getting Flo texts to remind me to do things it has given me confidence to start again and using Flo I have had less than 15 hospital visits*."

7.1.3 The Diabetes Medicines Use Review Toolkit

The Devon Local Pharmaceutical Committee (DLPC) has established a pharmacist led diabetes support service in response to the challenges that are faced. This has produced a Diabetes Medicines Use Review Toolkit[16], and operates a two stage process. The first is a more in depth, up front consultation, whereby the patient is supported with their diabetes medicines and self-management. This leads to an Implementation Plan for the patient covering for example diabetes control and lifestyle. This is followed by a second consultation that looks at and reviews progress.

The initiative has been assessed through a study of 111 patients and key results are that:

- 72 percent of patients agreed to follow the intervention plan

- 56 percent of patients were found to be adhering to recommendations at the second consultation
- Adherence has had big benefits, including savings of £440 per patient
- There have been sizeable DLPC service cost-benefits - which would deliver a forecast cost benefit of around £105 million if scaled up and delivered nationally.

7.1.4 Mission (Modern Innovative SolutionS to Improve Outcomes iN Severe Asthma)

Professor Anoop Chauhan, Consultant Respiratory Physician, Professor of Respiratory Medicine Director of Research and Innovation, Executive Wessex CRN, Wessex AHSN Respiratory Lead described how a medicines optimisation programme known as Mission (Modern Innovative SolutionS to Improve Outcomes iN Severe Asthma) to monitor asthmatics was implemented.

According to Chauhan, analysis of primary care data from four Wessex GP's surgeries using a number of criteria to indicate a potential to develop severe asthma, identified 1,653 potential patients that would benefit from attending an asthma clinic. After screening their notes, 369 patients were invited to attend. Of these, 69 patients did attend a clinic, where they were seen for a full carousel review to test their lung capacity by spirometry, have a CT scan or X-ray and review their inhaler technique. They also had sessions with a physiotherapist, dietician and a clinical psychologist for lifestyle discussions. After the clinic, 34 patients were identified for GP follow up, 13 were noted as potential research subjects, 22 were invited to the severe asthma clinic and one was referred to secondary care. Six months after attending, none of the patients that had been to the clinic were admitted to hospital with an asthma exacerbation and their corticosteroid use was reduced. Additionally, 65 patients said they felt more confident managing their asthma and many reported a better quality of life.

7.1.5 Optimising medicines for children with eczema: an emollient ladder

Nicola Broad, Community Dermatology Specialist Nurse, Bridgewater Community Care NHS Trust discussed how patients struggle to get appropriate timely advice regarding the management of eczema.

In a survey of 44 local GPs, the most common issue on eczema they found was the lack of time available to consult with patients and to educate them on safe and efficient application. Alongside this GPs were also struggling to prescribe given a lack of knowledge on topical products available.

The Eczema Expert 3 Step Plan was developed in response. Step one looks at knowledge, with a pack prepared giving parents all they need to know about eczema management. Step two looks at repairing and maintaining the skin barrier. It gives a choice of four emollients and bath oil and an Emollient Ladder indicating which products to use and when. Step three looks at reducing itch, redness and soreness. This uses a Steroid Ladder to promote understanding and safe use and to challenge steroid phobia.

It has been a hugely timely process, with very steep learning curves in terms of process, knowledge and skills, engagement and medicines management. However, real benefits are being seen in relation to improved patient and professional knowledge, reduced prescribing and referral costs, as well as use of fewer antibiotic treatments.

7.2 Reducing inappropriate polypharmacy

Professor Nina Barnett, Consultant Pharmacist, Care of Older People, Medicines Use and Safety Division, NHS Specialist Pharmacy Service in London North West Healthcare NHS Trust detailed the scale of the problem of inappropriate polypharmacy.

According to Barnett, more than one third of over 75's take four or more medicines regularly[20] and this goes up to eight if that person is in a care home[21]. The number of different medicines people are taking also ranges from two-28, whereas in the 1980s the over 75s were taking just three medicines.

Barnett explained: "*The problem with inappropriate polypharmacy is that it increases adverse drug reactions and can lead to costly hospital admissions, as well as patients stopping taking their medicines."*

There are a number of evidence-based tools HCPs can refer to for de-prescribing to reduce polypharmacy, which include: the Beers criteria[22]; Medication Appropriateness Index[23] and STOPP/START criteria and toolkit [24, 25].

A good example of a medicines optimisation programme to reduce inappropriate polypharmacy was presented by ***Eric Power, Head of Medicines Management, NHS Greater Huddersfield CCG and NHS North Kirklees CCG*.** He reported on interim results from a project aimed at reducing polypharmacy in a group of high-risk patients aged over 75 or on the palliative care register. The project enabled improvements in the time GPs had with patients and the communication between them, with support for GPs where needed, and promotion of good practice and helpful tools such as STOPP/START and NNT (numbers needed to treat) analysis.

The project involved approximately 1,950 patient reviews and these elicited very positive results. Over 80 percent of patients found the review useful, 90 percent would recommend one to their friends and family, and a third of patients said they had made a positive difference to their lives. GPs thought that the reviews identified a lot of important points, which would otherwise be missed, and provided valuable time that enhanced patient care. There have also been cost savings of £112,000 and notable reductions in harm - with more than 240 START alerts and 2,400 STOPP alerts resolved, the bulk of which involved high or extreme risk of harm.

A second medicines optimisation programme to reduce inappropriate polypharmacy was presented by ***Ganesh Sathyamoorthy, Assistant Director for Partnerships and Business Development at NIHR CLAHRC.*** He discussed a case study on the

use of a medication-review tool ‘STOPIT’ - the ‘Screening Tool for Older Peoples potentially Inappropriate Treatment’. The tool designed by CLAHRC North West London in collaboration with Imperial College NHS Healthcare Trust was used by doctors and pharmacists to review the medication of 1,368 patients over 70 years old across sites at Imperial College NHS Healthcare Trust and this helped identify and reduce polypharmacy in frail patients.

Sathyamoorthy explained: “We found over 100 HCPs had been prescribing patients five or more drugs which could be interacting to produce side-effects. After the review with STOPIT, 52 percent of the patients had at least one change in their medication.” Training on the STOPIT tool is now being included in junior doctor training by ward pharmacists.

Rita Sanghera, Medicines Optimisation Pharmacist, NHS Arden and Greater East Midlands Commissioning Support Unit outlined another project for reducing polypharmacy which saw care clinicians in South Warwickshire asked to conduct a medication review of patients of 65 years and older, identified as taking high-risk medicines, with the aim of reducing Hospital Admissions Related to Medicines (HARMs). A workshop had been held to understand the importance of reducing HARMs, which explored the role of GPs in reducing polypharmacy in the elderly. That session positioned HARMs as part of the Incentive Scheme 2013/14, provided a platform for the sharing of best practice, and also helped GPs plan how to take HARMs forward in individual practices.

A number of tools were produced as part of the project, including a risk indicator tool developed by Midlands and East Strategic Health Authority. This aimed to identify patients at increased risk of medicines related problems and could be used in a range of different healthcare settings. An Optimising Safe and Appropriate Medicines Use Tool was also developed. This was adopted and adapted from PrescQIPP, based on current evidence, local prescribing focus areas and current safety alerts/concerns. A reporting sheet was also developed in both hard copy and electronically, to enable more standardised data collection.

The results saw 33 practices review a total of 670 patients. Of 2,498 high-risk medications reviewed, 256 resulted in an intervention, such as stopping the use of a medicine, or a change in medication or dosage.

Benefits of the project included reduced HARMs, improved formulary adherence, and improved concordance and compliance issues. This also saw the stopping of treatments that were no longer needed, dose optimisation, and cost savings including through reduced waste. Scope for future development includes work in care homes / residential homes using a similar model, potential collaborative work with a local provider, and developing a local STOPP START Toolkit.

To ensure that there is funding for projects to reduce polypharmacy, attendees at the roadshows nationally stated that economic modelling should be used to not only show the direct monetary value of reducing the medicines burden, but also the estimated health and social care cost savings.

Delegates at the roadshows identified their key priorities in reducing polypharmacy as: being patient focused on improving quality of life; ensuring all HCPs have access to data concerning patients that are taking multiple medicines; having potential safety issues automatically flagged, as well as the use of thorough, accredited and standardised MURs.

7.3 Utilising clinical and community pharmacists' resources

At a number of the roadshows nationally, there were many case studies on how to utilise the resources of non-medical prescribers in medicines optimisation programmes with the focus on clinical and community pharmacists.

Six best practice examples of how pharmacists' resources can be utilised in community pharmacies, the domiciliary setting, hospitals and care homes are detailed.

7.3.1 The MOTIVE Initiative

Dr Rachel Howard, Specialist Pharmacist at Isle of Wight NHS Trust presented information about how clinical and community pharmacists' resources can be utilised for medicines optimisation. According to Howard, the Isle of Wight NHS Trust ran a pharmacy re-enablement service from 2011-2014 where at-risk patients were referred by social services after hospital discharge for an MUR by a hospital pharmacy technician/pharmacist and then if necessary, for an additional MUR in the pharmacy or domiciliary setting with a community pharmacist. To evaluate the performance of this service, Howard analysed data from 432 patients that had been referred to the service. She found that the 182 patients that received a hospital and community pharmacist review spent 12 days per year less in hospital; were 55 percent less likely to have a 30 day readmission and were 28 percent less likely to die than the 250 patients that had a hospital only pharmacy review.

Since the pharmacy re-enablement service has been successful, it is being continued as the MOTIVE initiative with community pharmacists informing GPs of any reviews of their patients. Additionally, patients identified as high-risk will be stratified into four levels and their aftercare could involve an MUR either in pharmacy or domiciliary setting with a community pharmacist if they are classified as at the highest risk level.

Howard concluded: "*The additional community pharmacists' review of high-risk patients often picks up on problems like medicine stockpiling and incorrect use of medicine, which a hospital pharmacist cannot see during a discharge MUR. The MOTIVE initiative closes that gap where problems can occur between hospital and GP care*."

7.3.2 The ICE hospital admittance avoidance service

Chetan Shah, Principle Pharmacist, Community Services, London North West Healthcare NHS Trust discussed how clinical pharmacists resources can be utilised for medicines optimisation. According to Shah the Intermediate Care Ealing (ICE), a hospital admittance avoidance service with a team of HCPs did not have a clinical pharmacist and only requested one on an as needs basis. An unfunded clinical

pharmacist was integrated into the team for a pilot study over eight weeks, during which time 159 patients had their medicines reviewed by the pharmacist in ward rounds or the domiciliary setting. Shah explained the results, saying: “From the 198 interventions we made, 27 percent then contacted a GP or community pharmacist, resulting in 27 percent of those patients having their medicines changed.”

A patient that received a domiciliary visit from the ICE pharmacist explained: *“I suffer with COPD and this led to me going into hospital last year with a chest infection. After I was released from hospital the ICE pharmacist came to visit me at my home. I had accumulated a stash of white tablets and I had no idea what they were all for so I had stopped taking some without consulting anyone. That was a bad idea. When the ICE pharmacist came to my home, I had to tell her how I took my tablets and used my inhaler. It turned out I was using my inhaler the wrong way and the ICE pharmacist sorted out all my medication so that I could take it all correctly. Since the ICE pharmacist came I feel much better, my life is quite changed and all is well again.”*

7.3.3 Refer-to-Pharmacy: e-referral from hospital to community pharmacy

Alistair Gray, Clinical Services Lead Pharmacist, East Lancashire Hospitals NHS Trust discussed the Refer-to-Pharmacy programme[26] which is the first fully integrated hospital to community pharmacy e-referral system innovated at East Lancashire Hospitals NHS Trust and developed in conjunction with Webstar-Health. It is fast, reliable, secure, auditable, and adaptable, allowing for two-way communications between the hospital and the pharmacy.

In essence, hospital pharmacists identify eligible patients for post-discharge follow up. They engage the patient in this process, showing them a short bedside film explaining why medicines adherence is important, and using mapping technology to help patients to pinpoint the right local pharmacy. With the patient’s consent, a referral is made to the community pharmacy immediately upon discharge, alerting the pharmacy and giving them access to all necessary patient information.
At this point the pharmacy has access to the full discharge letter and reason for referral. The community pharmacist contacts the patient to agree a mutually

convenient time to meet, or updates their medication record, depending on the type of referral. If a referral is not acknowledged within a specified time a message is sent back to the hospital requesting they contact the pharmacy directly to remind them. Refer-to-Pharmacy also facilitates communication back from the pharmacy to the hospital if further information is required. An inbuilt audit tool allows various performance indicators to be tracked. The target is to make 70 referrals each weekday to community pharmacies in the local health economy.

7.3.4 Utilising non-medical prescribers in hospitals

Suzanne Smith and Andrew Hardy, both Senior Clinical Pharmacists at Chesterfield Royal Hospital NHS Trust described how non-medical prescribers perform a range of different medicines reconciliations in hospital.

Smith stated: "*According to the World Health Organization up to 67 percent of patients' prescription medication histories have one or more errors, and up to 46 percent of medication errors occur when prescriptions are written at patient admission or discharge*[27]*. Therefore, it's imperative that medicines reconciliation should be completed within 24 hours of admission to hospital*."

Smith detailed that non-medical prescribers such as pharmacists and nurses can have more time to be with patients so could be used to prevent duplication, facilitate better patient involvement and compliance, as well as identify and reduce prescribing errors.

Smith presented a case study from Chesterfield Hospital to show that pharmacists and nurse prescribers are performing medicines reconciliations with high-risk patients that are frail, taking anti-coagulants or medicines to treat cancer and in pre-theatre admission assessment clinics to formulate appropriate post-operative medicines. Hardy also discussed how non-medical prescribers were being utilised at Chesterfield to perform medicines reconciliation in emergency care.
According to Hardy, this new way of working has meant fewer errors in oncology prescribing and reduced polypharmacy on the acute frailty unit. However, having

enough non-medical prescribers has required a release of staff to undertake the appropriate training and a change in the traditional pharmacy model.

Hardy concluded: "*Although having non-medical prescribers available to do what a doctor would have traditionally done is a significant investment, it has had good safety benefits at Chesterfield. Additionally, since we often accompany doctors on ward rounds it is helping them to understand more about how to perform accurate medicines reconciliations*."

7.3.5 Pharmacists in care homes

Ian Small, Deputy Head of Medicines Management, Norwich CCG presented on the Medication and Patient Review Service (MPRS) in Norwich CCG. The area was faced with a situation in which multiple GP practices were visiting care homes, to the extent that one home may have received six visits by six different GP surgeries in any one day. On top of this there was no co-ordination with Medicines Management teams, with care homes telling GPs what to prescribe and generating wastage through monthly repeat ordering regardless of need. The MPRS used Pharmacy Technicians to gather patient data for assessment by the Pharmacist and GP collectively in surgery prior to carrying out joint care home visits. Changes were activated immediately.

Whilst improving quality was the main thrust of the review, financial savings are also being achieved. This has already reached over £12,500 through review underway in 28 care homes and 14 GP practices and amongst 435 patients, with 674 interventions made. Other benefits include full medication review, relationship building and increased awareness, communication and education of all involved, multi-disciplinary team working, and provision of wound care formulary to homes to reduce wastage and give more cost-effective prescribing.

Jayesh Shah, Prescribing Adviser, on behalf of Brighton and Hove CCG described how in 2011-15 Brighton and Hove CCG commissioned a pharmacist-led service to provide individual Clinical Medication Reviews for each patient in care homes. He stated: *"In 2013-2014 we performed 2,000 Clinical Medication Reviews*

in care homes and made 6,000 interventions to help optimise medicines. This produced an annual cost saving of £330,000 on medicines costs and £380,000 estimated cost saving on unnecessary hospital admissions caused by medication issues."

Shah added: "*One patient was taking 25 different medicines and this was reduced to five following a Clinical Medication Review with a clinical pharmacist. After we reduced the number of medicines she was taking, the patient reported feeling more alert and her memory loss improved. Additionally, she has had fewer falls and has reduced her GP visits from 12 a year to one. She is also now able to understand what to take and when and can prepare her own pill box so feels more in control of her health."*

At the roadshows, a number of barriers preventing the use of community pharmacists in medicines optimisation programmes were expressed. One delegate stated: *"Community pharmacists have to be better trained in performing MURs and they also have to have access to the Summary Care Record when patients are prescribed new medicines because they are often best placed to explain the medicine and how to use it and this will help patients remain adherent to their medicine."*

Another commented: *"We must work with community pharmacists to promote their use of the New Medicine Service (NMS) and perhaps targets should be put in place locally to improve the uptake of this service."* To incentivise community pharmacists to undertake a NMS consultation with for example oral anticoagulants, it was suggested that a commissioning for quality and innovation (CQUIN)[28] payment scheme could be put in place for performing the NMS with specific types of high-risk medicines.

7.4 Use of IT tools

At the roadshows, a number of innovative uses of IT tools were described to identify high-risk patients, improve patient safety and improve transfer of care.

Lauren Fensome of PRIMIS, at The University of Nottingham discussed the use of audit tools which GPs can download for use, including GRASP-AF, GRASP-COPD, Diabetes Care Audit, Warfarin Patient Safety Audit and Asthma Care Audit.

Fensome encouraged HCPs in GP surgeries nationally to make full use of PRIMIS tools (which are free to download) via the website[29] and to access the training and support that is available to help with medicines optimisation in the primary care setting.

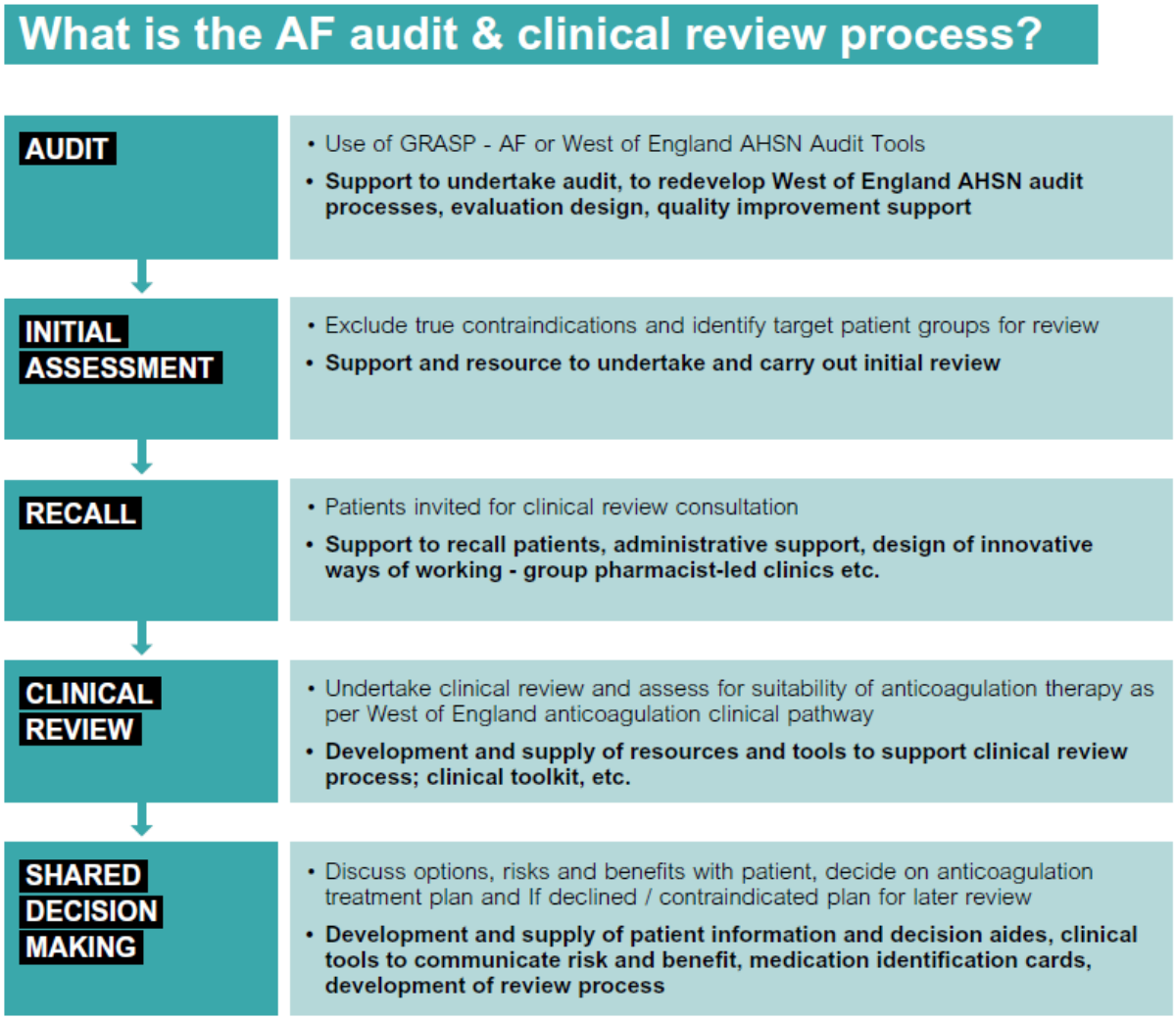
Good examples of the use of IT tools for medicine optimisation programmes are detailed.

7.4.1 'Don't Wait to Anticoagulate'

Trevor Beswick, Director South West Medicines Information and Training introduced the *'Don't Wait to Anticoagulate'* project, which is a joint initiative between the West of England AHSN and three pharmaceutical companies.

The project has been based on a process of AF audit using IT tools either GRASP-AF or West of England AHSN tools to identify atrial fibrillation patients, followed by clinical review as shown in Figure 2.

Figure 2: The Audit and Review Pathway in the *'Don't Wait to Anticoagulate'* Project



Stephen Ray, Quality Improvement Programme Manager, West of England AHSN went on to describe the way in which the project has focused on working with clinicians to embed a Quality Improvement Approach. Phase 1 engaged with 11 innovator GP practices to establish how to drive sustainable change in the primary care setting through testing four service models:

- Straight backfill for clinical time within GP practices
- Upskilling within practice to create capacity and resource amongst existing staff members (HCA/practice nurses)
- Identify resource external to practice but from within NHS (practice pharmacists)

- External resource via Interface Clinical Services (with commitment to upskill practice staff)

GPs were highly active in testing these models and indeed throughout Phase 1. This includes trialling and undertaking AF patient audits, developing criteria to support clinical reviews, trialling GP toolkit, assisting in evaluation and spreading good practice. There has also been substantial engagement with medicines management teams.

Most importantly however, has been the level of patient consultation to understand their needs and to co-create the solution. The '*Don't Wait to Anticoagulate'* web site[30] has functionality to look at patient risk factors and create personalised risk sheets that can be used to inform discussions between individuals and their GPs to get a clearer view on risk levels and to guide treatment choices. Focus groups have also been central, with development of a Patient Decision Aid a key output. The real benefit here has been in understanding how to communicate in the most meaningful way to support people in making decisions. The balance is in not undermining risk whilst also pushing innovative medicine use forward.

Phase 2, currently active, is focused on engaging Gloucestershire CCG to assess how to best scale up the project, notably amongst a much larger group of primary care practices who are typically not as likely to adopt innovation as early as those in Phase 1. Phase 3 will look at four other CCG areas to drive scale up further.

7.4.2 IT for transfer of care

Steven Brice, Assistant Director of Pharmacy, Newcastle upon Tyne Hospitals NHS Foundation Trust outlined a project to develop a regionally accepted framework for electronic communication between secondary care and community pharmacy. This covered 10 Hospital Trusts, 6 Local Pharmaceutical Committees (LPCs) and over 700 Community Pharmacies, and the project team included representatives from all groupings, including patients. The project examined the use of a simple web-based application called 'PharmOutcomes'[31] to simplify referrals whilst improving data collection. This can develop new template reports and offers a

secure method of data transfer, at a minimum cost. A regional LPC meeting agreed to purchase a North of England 'super licence' to allow referrals across LPC boundaries. The project has examined use of 'RiO' scoring on the likelihood of re-admission, as well as the 'MORISKY' scale[32] to measure medicine adherence. While a wider roll out of the application is on schedule for 2015, there remain some challenges including around hospital IT governance, hospital pharmacy implementation, and encouraging use with community pharmacy. Early learnings include the need to ensure all referrals are followed up, as well as rejected referrals, and continuing to ask patients about their experience and make improvements.

7.5 Reducing prescribing errors

One final medicines optimisation theme that was mentioned at the roadshows was how to reduce prescribing errors and three case studies of good practice using IT tools and training methods are described.

7.5.1 PINCER

Dr Sarah Rogers, Senior Research Fellow, Division of Primary Care, University of Nottingham discussed the development and roll out of PINCER (pharmacist-led information technology intervention for medication errors). Rogers described how a trial involving patients on high-risk medicines at 72 general practices showed that after six months, the PINCER intervention was more effective at reducing common errors with 50 percent fewer prescribing errors than using a simple feedback strategy[33]. She then detailed how PINCER is available via Primis, has been downloaded to 2,000 practices in 200 CCGs and is now recommended by NICE in its medicines optimisation clinical guidelines[11].

Rogers stated: "*We have funding from the Health Foundation to help implement PINCER across the East Midlands in at least another 150 general practices by the end of 2016. To do this we're employing six pharmacists who will work with practice staff using specific software to identify patients at risk of common prescribing and drug monitoring errors. Then with practice staff they'll form a plan of how to work with*

these patients to manage their medicines, reduce medicine errors and improve their safety."

7.5.2 EPIFFany training for junior doctors

Dr Rakesh Patel, NIHR Academic Clinical Lecturer in Medical Education, University Hospitals of Leicester, NHS Trust detailed an education intervention called EPIFFany (Effective Prescribing Insight for the Future) designed to improve the prescribing skills of junior doctors[34].

Patel stated: "*According to the General Medical Council's EQUIP study[35], junior doctors are twice as likely to make a prescribing error compared to other HCPs and we wanted to see if we could change that by giving them better support with a range of different training tools*."

Patel detailed how over four months junior doctors at Leicester General Hospital were provided with a simulated 'ward round', face-to-face teaching in a 'feedback clinic' with pharmacists and clinicians, clinical decision support via mobile phone and tablet, as well as eLearning modules to practice complex problem-solving and decision-making involving medicines.

Patel concluded: "*After the EPIFFany training, there was a 50 percent reduction in prescribing errors seen with the junior doctors and the error severity was also reduced. Additionally, their competence gain was the equivalent to that gained from 12 months experience. One senior consultant also commented that these junior doctors were able to engage with patients to have conversations that had a beginning, middle and end*."

7.5.3 OptiMed unit dose laboratory

Graeme Hall, Deputy Chief Pharmacist, University Hospitals of Leicester, NHS Trust presented details on how OptiMed ID Unit Dose Laboratory, an automated medication dispensing system produced by Italian firm, Ingegneria Biomedica Santa

Lucia is being trialled across four ward areas within the renal specialty at the Leicester General Hospital.

Hall stated: *"In most hospitals there are approximately 7,000 medicines-related activities on a typical day and around 40 percent of a nurses' day is spent either administering medicines or on some medicines-related activity. Unfortunately, in English hospitals it is estimated that administration error rates in adult patients is around 5.6 percent[36]. These errors include giving a patient the wrong dose or frequency, the wrong medicine and omitting or delaying the medicine. One reason for this is that nurses who most commonly give medicines have to check a number of things and places to find the medicines."*

According to Hall if you automate dispensing, it will save time, as well as reduce administration errors and is the rationale behind trialling OptiMed. This system uses individualised doses and links electronic prescribing to unit dose packing robots and logistics software. There is bar code recognition of medicines on the medicines packaging, each individual patient medicine drawer in the drug trolley and patient hospital wrist band, all of which nurses scan to ensure traceability and accountability for each dose given.

Hall concluded: *"This centralised medicines administration approach is being used in 20 hospitals in Italy. To ensure the validity of this strategy in England, the cost, time saving and patient safety benefits of using OptiMed are going to be evaluated independently by Loughborough University. We hope that the data from the trial will provide the evidence to show this is a future model to improve medicines safety and reduce wastage in NHS Trusts."*

References

[1] Pharmaceutical Price Regulation Scheme 2014 https://www.gov.uk/government/publications/pharmaceutical-price-regulation-scheme-2014

[2] Medicines Optimisation: Helping patients to make the most of medicines http://www.rpharms.com/promoting-pharmacy-pdfs/helping-patients-make-the-most-of-their-medicines.pdf

[3] Health Survey for England - 2013 http://www.hscic.gov.uk/catalogue/PUB16076

[4] Medication Adherence: WHO Cares? http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3068890/

[5] Patient adherence to medicines http://www.acmedsci.ac.uk/policy/policy-projects/patient-adherence-to-medicines/

[6] Medicines Use Review http://www.rpharms.com/health-campaigns/medicines-use-review.asp

[7] Polypharmacy and medicines optimisation http://www.kingsfund.org.uk/publications/polypharmacy-and-medicines-optimisation?gclid=CK3-msOpm8QCFXGWtAodfQgArw

[8] Adverse drug reactions as cause of admission to hospital: prospective analysis of 18 820 patients http://www.ncbi.nlm.nih.gov/pmc/articles/PMC443443/

[9] Adverse Drug Reactions in Hospital In-Patients: A Prospective Analysis of 3695 Patient-Episodes http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2635959/

[10] FIVE YEAR FORWARD VIEW http://www.england.nhs.uk/wp-content/uploads/2014/10/5yfv-web.pdf

[11] Medicines optimisation: the safe and effective use of medicines to enable the best possible outcomes http://www.nice.org.uk/guidance/ng5

[12] Medicines Optimisation Supporting information for the prototype dashboard http://www.england.nhs.uk/wp-content/uploads/2014/06/mo-dash-supp-info.pdf

[13] The New Medicines Service https://www.gov.uk/government/news/the-new-medicines-service

[14] Support for New Medicine Service http://www.rpharms.com/nhs-community-pharmacy-contract-england/new-medicine-service.asp

[15] The NHS Outcomes Framework 2014/15 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/256456/NHS_outcomes.pdf.

[16] The Devon LPC diabetes MUR plus service & evaluation protocol http://new.psnc.org.uk/devon-lpc/wp-content/uploads/sites/20/2013/07/Plymouth-HLP-DLPC-Diabetes-MUR-Plus-Protocol-Final-v2.pdf

[17] My Medication Passport https://www.networks.nhs.uk/nhs-networks/my-medication-passport

[18] Evaluation of My Medication Passport: a patient-completed aide-memoire designed by patients, for patients, to help towards medicines optimisation http://bmjopen.bmj.com/content/4/8/e005608.full

[19] "Florence" the Simple Tele-health service http://www.nottinghamnortheastccg.nhs.uk/nhs/florence-the-simple-tele-health-service/

[20] Polypharmacy Guidance October 2012 http://www.central.knowledge.scot.nhs.uk/upload/Polypharmacy%20full%20guidance%20v2.pdf

[21] Care homes' use of medicines study: prevalence, causes and potential harm of medication errors in care homes for older people http://qualitysafety.bmj.com/content/18/5/341.full

[22] AGS Beers Criteria for Potentially Inappropriate Medication Use in Older Adults 2012 List of drugs to avoid in older people http://www.americangeriatrics.org/files/documents/beers/2012AGSBeersCriteriaCitations.pdf

[23] The medication appropriateness index at 20: where it started, where it has been, and where it may be going. http://www.ncbi.nlm.nih.gov/pubmed/24062215

[24] STOPP/START criteria for potentially inappropriate prescribing in older people: version 2 http://www.ncbi.nlm.nih.gov/pubmed/25324330

[25] STOPP START Toolkit Supporting Medication Review http://www.cumbria.nhs.uk/ProfessionalZone/MedicinesManagement/Guidelines/StopstartToolkit2011.pdf

[26] Refer-to-Pharmacy at ELHT www.elht.nhs.uk/refer

[27]Assuring Medication Accuracy at Transitions in Care http://www.who.int/patientsafety/solutions/patientsafety/PS-Solution6.pdf

[28] Commissioning for quality and innovation (CQUIN): 2013/14 guidance http://www.england.nhs.uk/wp-content/uploads/2013/02/cquin-guidance.pdf

[29] Primis making clinical data work www.nottingham.ac.uk/primis/joinus

[30] Don't wait to anticoagulated http://www.weahsn.net/anticoagulate-tool/

[31] PharmOutcomes - Live System https://pharmoutcomes.org/pharmoutcomes/

[32] Predictive Validity of a Medication Adherence Measure in an Outpatient Setting http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2562622/

[33] A pharmacist-led information technology intervention for medication errors (PINCER): a multicentre, cluster randomised, controlled trial and cost-effectiveness analysis http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(11)61817-5.pdf

[34] Prescribing Insight for the Future (ePIFFany) http://heeminnovation.co.uk/projects/prescribing-project/

[35] An in depth investigation into causes of prescribing errors by foundation trainees in relation to their medical education. EQUIP study.http://www.gmc-uk.org/FINAL_Report_prevalence_and_causes_of_prescribing_errors.pdf_28935150.pdf

[36] Studies report administration error rates in adult patients in 5.6% of inpatient administrations in English hospitals http://qualitysafety.bmj.com/content/22/4/278.full.pdf