Medicines optimisation in older people (MOOP); the journey from pilot to permanent service

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Abstract

Title
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Summary
In response to the proposed restructuring of health and social care in Northern Ireland in 2011, an ageing population with increasing pharmaceutical care needs and the need to create an enhanced career pathway for hospital clinical pharmacists working in the region, two Trusts piloted consultant pharmacist-led medicines optimisation case management services for older people in care homes and in intermediate care. Further to process mapping events attended by multiple stakeholders, the new models of patient care were developed and evaluated in 2012-2014. This evaluation mainly focused on medication appropriateness, clinical interventions made and their impact on quality of patient care, drug cost savings and healthcare resource usage post completion of pharmacist case management. Based on outcomes, the two models were further refined, reproduced in the other Trust and evaluated again in 2015/16. At all stages, robust evaluation yielded positive clinical and economic outcomes for both models. Based on the results of the pilots and demonstration of their reproducibility, the Department of Health in Northern Ireland permanently funded the roll out of these services across the region. An additional work stream was added in 2017 which focuses on medicines adherence in older people.

Keywords: consultant pharmacist, polypharmacy, case management, prescribing appropriateness, evaluation, service reproducibility.

Background

In June 2011, the Minister for Health, Social Services and Public Safety in Northern Ireland announced that a review of the provision of Health and Social Care (HSC) Services in Northern Ireland would be undertaken. The review team's findings and recommendations were outlined in the landmark document 'Transforming Your Care (TYC), a Review of Health and Social Care in Northern Ireland.'[1] TYC identified twelve major principles for change, which should underpin the shape of the future model proposed for health and social care (Box 1).

TYC ultimately became known as the 'shift left' as £83 million was redirected from hospital care to primary, community and social care services. Similar to all other healthcare systems, there was now also the recognition that any changes to the healthcare system and service provision would need to cater for an ageing population with the need to deliver services nearer to home.

Around the same time, hospital pharmacy in Northern Ireland was considering the workforce and clinical career pathways; 48 consultant pharmacists were in post in England and Wales, but no similar posts existed in Northern Ireland.

This paper outlines the approaches taken to successfully test, reproduce and scale the consultant pharmacist-led medicines optimisation in older people (MOOP) service in Northern Ireland, which can be adapted to meet local needs as appropriate.

Introduction of New Services

Pharmacy in both the Western Health and Social Care Trust (WHSCT) and the Northern Health and Social Care Trust (NHSCT) responded to the principles of TYC, the need to serve an older population and the desire to establish consultant pharmacist posts in the province by introducing two new and innovative consultant pharmacist-led services. The WHSCT focused on developing an intermediate care pharmacy service whilst the NHSCT concentrated on delivery of Trust outreach services to care home patients. Initial work was funded for two years by the former Department of Health, Social Services and Public Safety in Northern Ireland (DHSSPSNI, now the Department of Health) via the Regional Innovations in Medicines Management fund.

Process Mapping

Lessons have been learned and challenges overcome throughout the development of what ultimately became the Medicines Optimisation in Older People (MOOP) pharmacy service (see Box 2). Initial lessons related to the need for early engagement with stakeholders across all sectors so as to 'win hearts and minds', and the need to 'assume nothing' and fully understand the system into which the service was being introduced.

One way of achieving this was via process mapping; the first process map was led by a non-pharmacist Lean-trained facilitator and attended by stakeholders from throughout secondary and primary care including medical consultants, directors of service, ward nursing staff, clinical pharmacists, community pharmacists and the project manager.

Process mapping has many potential benefits including:

- the provision of a starting point for an improvement project specific to your own place of work
- creation of an ownership culture
- provision of responsibility and accountability for a team
- illustration of a patient pathway or process
- understanding of a service from a patient's perspective
- acting as an aid to plan changes more effectively
- enabling the collection of ideas (often from staff who understand the system but who rarely have the opportunity to contribute to change)
- creation of an interactive event that engages staff
- delivery of an output and end product (a process map and action plan).[2]

This approach has been used many times during the ongoing development and refinement of MOOP patient pathways and originally informed the design of a consultant pharmacist-led case management model of care for patients transferred from acute into intermediate care within the WHSCT. There can be varying definitions of 'intermediate care' used by different Trusts with other terminology including 'reablement,' 'interim' and 'crisis response.' The general pharmacy case management model developed and refined by the team over a period of six years (Figure 1) can be delivered to patient cohorts in intermediate care settings including community hospitals and Trust purchased nursing/residential home beds regardless of the definition or description used. Prior to introduction of this service, pharmacy had a 'supply only' role but the subsequent positive impact of this pharmaceutical care model on patient

TYC 12 Principles for Change[1]

1. Placing the individual at the centre of any model by promoting a better outcome for the service user, carer and their family.
2. Using outcomes and quality evidence to shape services.
3. Providing the right care in the right place at the right time.
4. Population-based planning of services.
5. A focus on prevention and tackling inequalities.
6. Integrated care – working together.
7. Promoting independence and personalisation of care.
8. Safeguarding the most vulnerable.
9. Ensuring sustainability of service provision.
10. Realising value for money.
11. Maximising the use of technology.
12. Incentivising innovation at a local level.

Box 1

Lessons from the MOOP Journey

1. Develop models of care in line with strategic direction and policy.
2. Engage early with all potential stakeholders.
3. Fully understand the system and context you want to introduce a new service to i.e. process map.
4. Identify potential service gaps and issues and then create an action plan in collaboration with all stakeholders.
5. Robustly evaluate with agreed relevant outcomes reflective of pharmacy input.
6. React to data and refine models of care in response to the evidence.
7. Disseminate at every opportunity i.e. share the learning.
8. Stay consistent with proven care models and demonstrate reproducibility.
9. Don't reinvent the wheel but know when to fix it.
10. Standardise practice to enable reproducibility and roll out.
11. Capture the patient 'voice' and service user experience.

Box 2

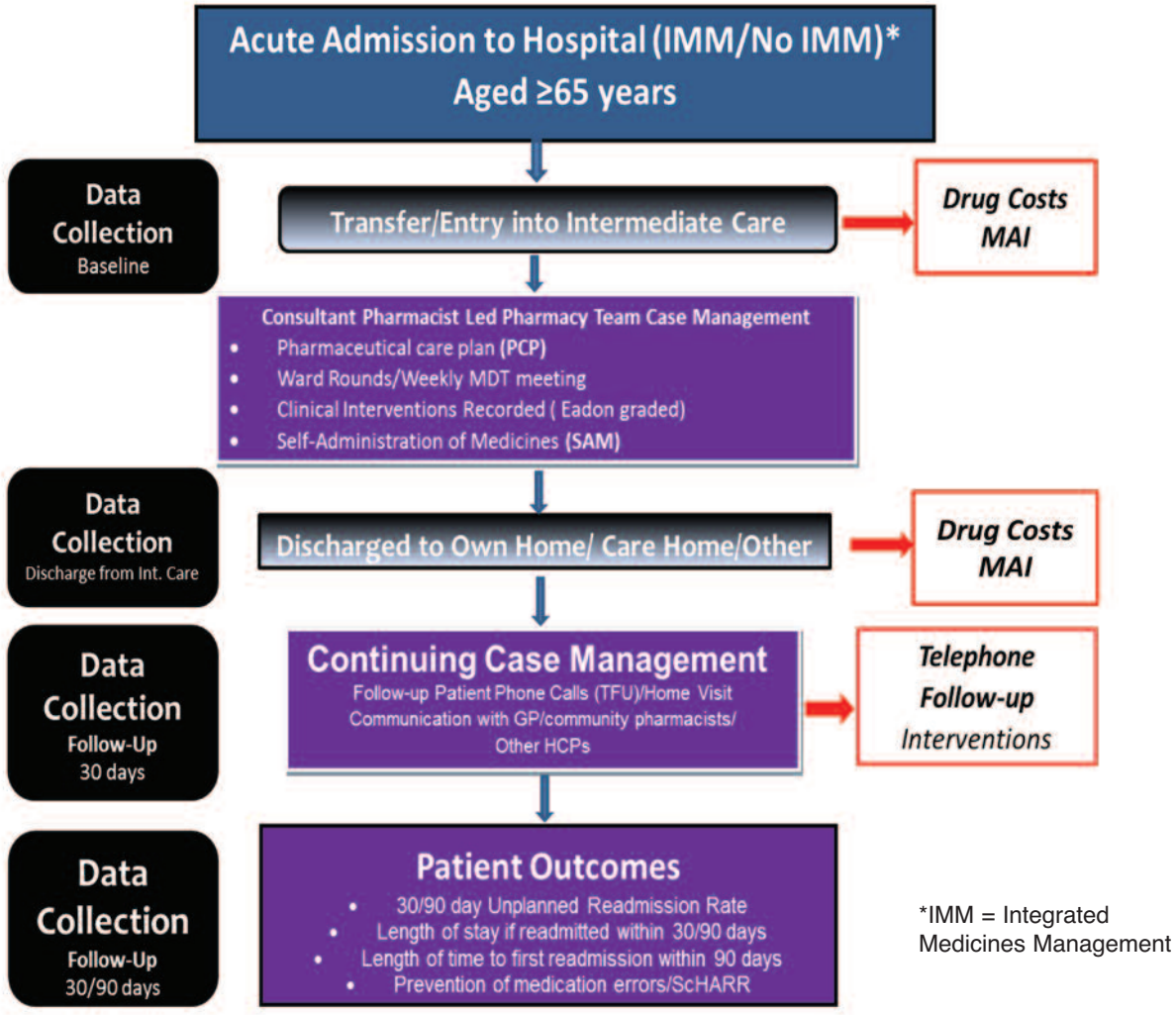

Figure 1: Consultant Pharmacist-led Pharmacy Team Case Management of Older People in Intermediate Care

outcomes and healthcare resource savings clearly demonstrated the need for this service in this particular healthcare setting. These included statistically significant improvement in appropriateness of prescribing (measured via application of the medication appropriateness index (MAI)[3]), annual drug cost savings of £68k, a decrease in intermediate care length of stay and a reduction in unplanned readmission rates.[4]

The NHSCT medicines optimisation care home model has also evolved over the years from the initial pilot work and is illustrated in its present form in Figure 2. From 2012 to 2014 Trust outreach medicines optimisation clinics were delivered by the consultant pharmacist working alone or in collaboration with a consultant geriatrician. This service to care homes also demonstrated significant drug cost savings, statistically significant improvement in appropriateness of prescribing and reduced healthcare resource usage including a 14% reduction in inappropriate A&E presentations.[5] The outcomes from the pharmacist working alone did not substantially differ from those where the medical expert was present. The 'top heavy' service was therefore remodelled and refined to include a referral mechanism to the geriatrician which no longer required them to be physically present but available when deemed medically necessary.

Another significant lesson at this stage in the journey related to the essential requirement for robust evaluation and evidence. Extensive data were collected by both services in the first two years. The first major challenge was encountered in 2014 when funding for these now embedded services from the Regional Innovations in Medicines Management ended; using the data collected, testimonials and evidence of the benefits to the local older populations, support from Local Commissioning Groups (LCGs) was sought and secured in both Trusts. This ensured the service could continue into 2015.

The Change Fund

In 2015 the DHSSPSNI launched the Change Fund seeking to fund pilot projects which already had demonstrable outcomes but needing to establish whether they were reproducible in another geographical area/healthcare setting. This funding was secured and the WHSCT introduced the care home model whilst the NHSCT introduced the intermediate care pathway to two community hospitals similar in size and demography to that in the WHSCT where the model had been developed.

Six Band 8a case management pharmacists (all of whom were independent prescribers) were recruited into the service and, under the mentorship of the consultant pharmacists, they implemented and delivered the intermediate care and care home MOOP models whilst collecting extensive data on all case managed patients. In addition, the WHSCT pharmacists tested different GP communication models for the care home service where clinical interventions and recommendations were actioned either via letter (original NHSCT approach), teleconference or direct access into GP systems. The type of communication varied throughout the Trusts and was ultimately found to depend upon both the size and location of the care home and the wishes of the GP responsible for patient care.

Team work across two Trusts

Throughout establishment of the services in both Trusts, the pharmacy teams worked collaboratively ensuring standardisation of approach and service delivery. Data collection and application of tools such as the MAI[3] and the Eadon[6] criteria (a scale from 1 to 6 reflective of quality of patient care with a score of ≥4 indicating improved quality) was peer reviewed and quality assured at monthly team meetings attended by the consultant pharmacists and chaired by the project manager. The teams collaboratively developed guidelines e.g. laxative prescribing and educational posters for display in care homes such as Acute Kidney Injury, thereby ensuring the same messages were being shared across a large geographical area serving approximately

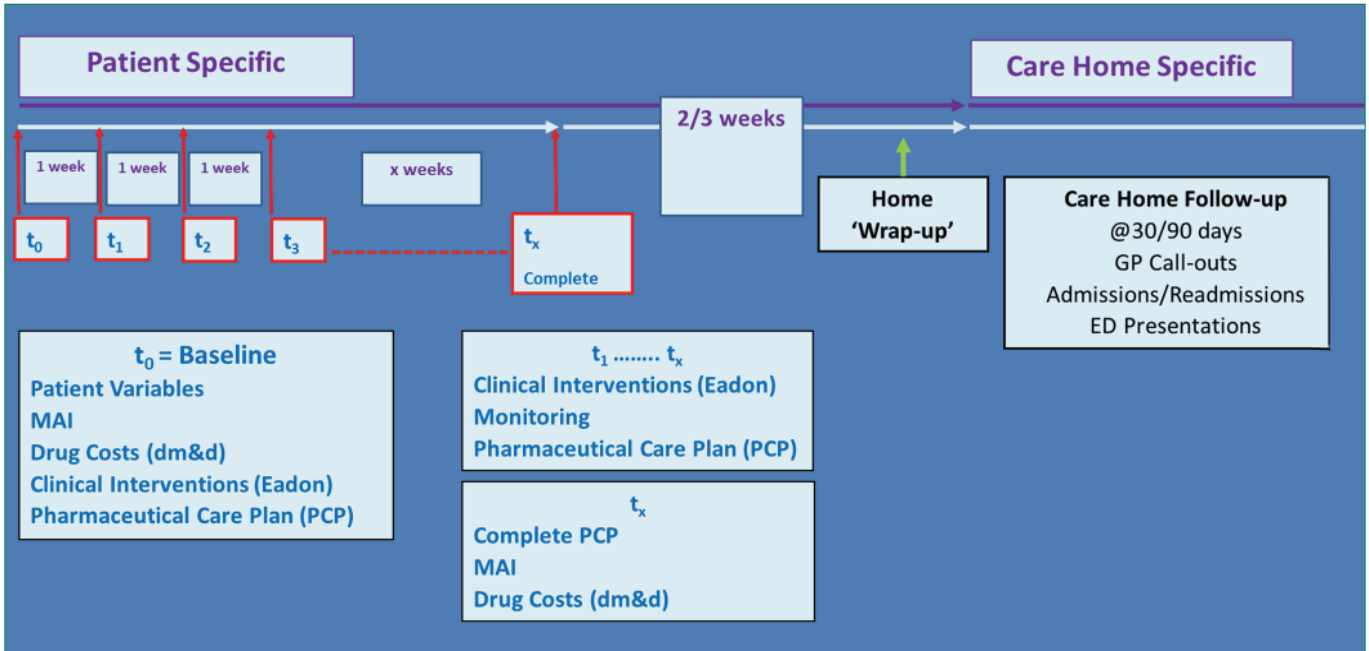

Figure 2: The general pharmacist case management medicines optimisation model for care homes

700,000 people. Educational needs were identified and experts invited to these meetings to present on key topics.

Reproducibility

Reproducibility of outcomes for both models was demonstrated in 2016 with both producing similar, if not further improved results to that achieved in the pilots.[7,8,9,10] The 'Invest to Save' returns of the original models per £1 invested were £2.35 to £4.00 for intermediate care and £2.39 to £3.00 in care homes; these returns were maintained. These models therefore demonstrated the extensive reproducible cost efficiencies which can be achieved using this patient-centered approach to medicines optimisation and pharmaceutical care in these vulnerable older patient cohorts (see Tables 1 and 2).

Capturing the Patient Voice and Service User Experience

With the pressure to prove an 'Invest to Save' return throughout the years from 2012 to 2016 and the constant threat of funding removal, focus on outcomes was both quantitative and financial. The project team recognised this but with the guiding principle that medicines optimisation should be patient-centered, they sought to capture the patient voice and service user experience. The MOOP service commissioned the local charity Age NI (equivalent to Age UK) to achieve this with the following three main aims:

1. To gain insight into the experiences of older service users into this approach
2. To add value to ongoing evaluations being carried out by the project team
3. To reflect the patient journey in the process of medicines optimisation

Age NI has developed a unique programme where older people are recruited and trained in facilitation, listening skills and report delivery. Once trained, facilitators are engaged in carrying out bespoke, facilitated sessions with older people on key issues including health and social care, poverty and citizenship so that their voices can be heard, and their views and experiences can be used to influence and shape policy and practice on ageing issues. A total of 28 people were engaged as part of the process, comprising of patients in nursing home and community hospital settings, carers and a cross section of staff members. Some interview findings are shown in Figure 3.

Age NI made the following recommendations in their final report:

- Age NI supports the person-centred approach demonstrated by the consultant pharmacist-led pharmacy teams in the medicines optimisation project, and believes this to be a fundamental aspect in the delivery of excellent care to older people. The role of the specialist pharmacist in care homes and community hospitals should be adequately funded and provided in healthcare settings throughout Northern Ireland
- Older people and those caring for them should be included in discussions about their medicines, and information and support provided to make sure they are fully aware of the medicines they are taking, including side effects, so that any issues can be raised easily and at an early stage
- It is crucial that participation and engagement are factored into any project from the beginning. The use of the peer facilitator model of engagement has ensured that the voices of older people who are in care homes or on hospital wards can be heard, and can influence decisions about their care
- Systems should be in place to ensure that the medical and pharmaceutical needs of older people are regularly reviewed and are appropriate for them at any given time.[11]

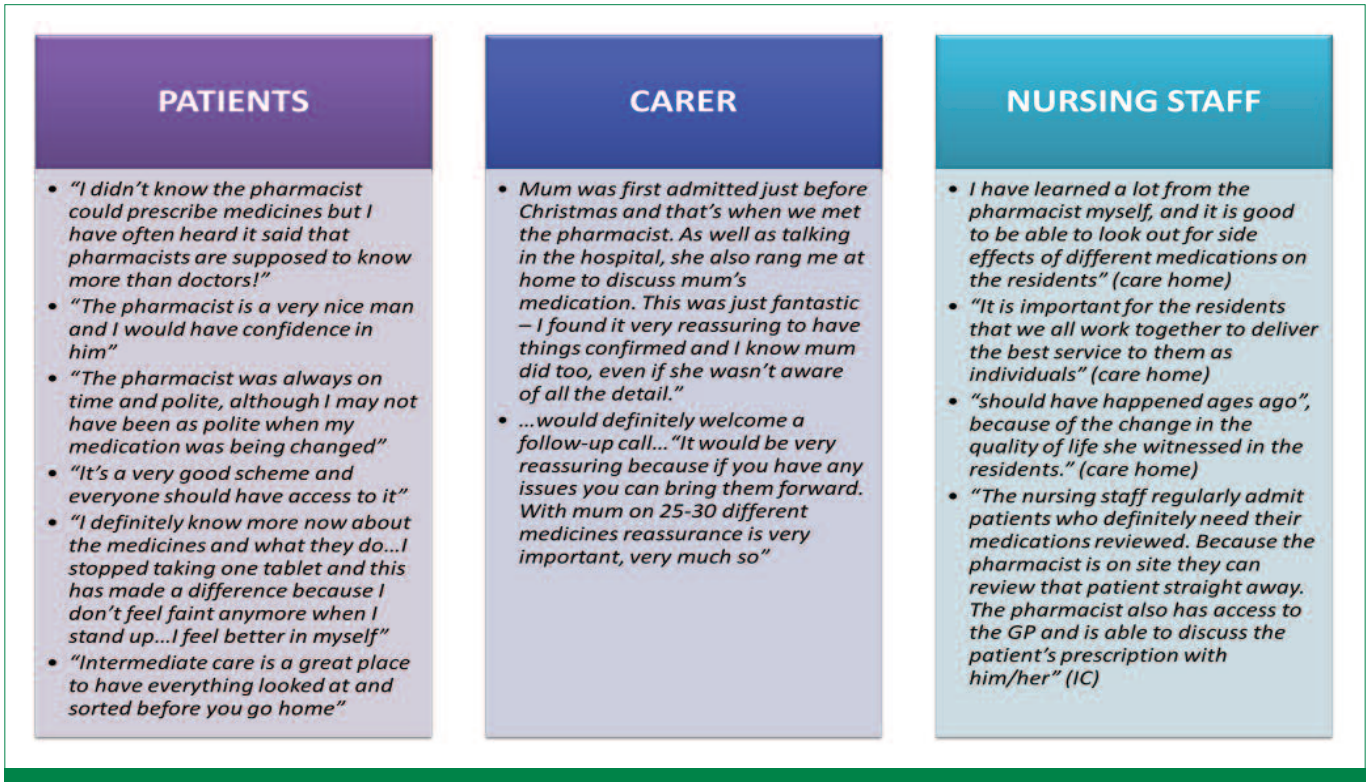

Figure 3: Age NI Peer Facilitator Findings

Future evaluation of the MOOP service will again aim to capture the service user experience and the development and use of appropriate Patient Reported Outcomes Measures (PROMs) is being considered.

The Medicines Optimisation Quality Framework

In May 2016, the Department of Health published the Medicines Optimisation Quality Framework[12] with the overall aim of maximising health gain for patients through the appropriate, safe and optimum use of their medicines. The framework contains ten quality standards and nine overarching key recommendations to introduce and support a regional model for medicines optimisation. It complements the TYC principles[1] and recommendations made in the 'Donaldson Report – the Right Time, Right Place' published in 2014,[13] which was an expert examination of the application of health and social care governance arrangements for ensuring the quality of care provision in Northern Ireland.

Figure 5 shows the Northern Ireland Regional Medicines Optimisation Model; within the framework document, this model outlines what should be done at each stage of the patient pathway in each of four different settings (hospital, general practice, community pharmacy and social care) to help gain the best outcomes from medicines.

	WHSCT 2012-2013 (n=453)	WHSCT SEP '15 – FEB'16 (n=210)	NHSCT SEP'15 – AUG '16 (n=322)
Age (years)	82.8±7.1	82.1±7.2	82.1±7.8
Mean Length of stay in IC (Days)	29.5	34.3	33.1
Origin of Admission to IC	100% Acute Care (WHSCT)	95.7% Acute Care (WHSCT) 0.4% Acute Care (Other Trust) 3.3% Older People Assessment Liaison Service (OPALS) 0.4% Rapid Access Clinic	56.2%% Acute Care (NHSCT) 24.5% Acute Care (Other Trust) 17.7% GP Step-up Request 1.6% Other
Average number of clinical interventions made per patient during their stay in IC	2.5	5.5	3.9
% Clinical Interventions Eadon Grade ≥4	84.0	99.2	97.5
% Patients followed-up post discharge	32.7	64.4	49.4
% Patients with interventions at follow-up	45.9	20.1	40.9
Number of drugs taken on admission to IC	10.7±4.3 (Range = 0 to 25)	10.7±4.3 (Range = 2 to 23)	10.7±4.1 (Range = 1 to 24)
TOTAL MAI on admission to IC *	7.1±5.7 (n=355) (Range = 0 to 27)	13.45±10.07 (n=210) (Range = 0 to 46)	16.84±12.77 (n=322) (Range = 0 to 63)
TOTAL MAI on discharge from IC*	2±2.6 (Range = 0 to 14)	0.06±0.46 (n=210) (Range = 0 to 6)	0.67±2.35 (n=287) (Range = 0 to 16)
Drug cost savings per patient per annum	£150.11	£205.50	£229.13

Table 1: Intermediate Care (IC) Original Results and Change Fund Reproducibility Results (2015/16)

* $p<0.001$ Paired Samples Wilcoxon Signed Rank test

The Transformation Fund

In response to a recommendation made in The Donaldson Report, the DHSSPSNI appointed an expert, clinically led panel to lead on an informed debate on the future best configuration of Health and Social Care services in Northern Ireland. The resulting report 'Systems, not Structures: Changing Health and Social Care' in 2016 outlined the reasons and need for whole system transformation with significant integrated cultural and operational reform.[14] Many of the recommendations made in this report were recognised as requiring additional, transitional funding. The panel therefore recommended that the Minister should establish a ring-fenced transformation fund to ensure this process was appropriately resourced.

The Minister for Health announced the £30 million Transformation Fund with £2.3 million permanent and recurrent funding committed to implementation of the Medicines Optimisation Quality Framework. A decision was then made to use this fund to roll out the MOOP services to each of the five Trusts in Northern Ireland. The Medicines Optimisation and Innovation Centre (MOIC) was also resourced whilst remaining money was devoted to the much needed area of mental health.

Consultant Pharmacist Mentorship/MOOP Roll Out

Each MOOP Trust team is led by a consultant pharmacist (older people) with the team consisting of one case management care homes specialist pharmacist, one case management intermediate care specialist pharmacist, one medicines adherence case management pharmacist and one intermediate care technician. The consultant pharmacist has provided clinical expertise,

REFINED CARE HOME MEDICINES OPTIMISATION CASE MANAGEMENT MODEL			
	WHSCT (Northern Sector) (n=268)	**WHSCT (Southern Sector) (n=297)**	**NHSCT (n=530)**
Age (mean ± SD)	83.9 ± 7.7 years (Range 65 to 102)	84.1 ± 7.9 years (Range 66 to 100)	84.7 ± 7.1 years (Range 65 to 99)
Communication Model with GP	128 Real time access 91 Letter and telephone call 49 Letter to GP	294 real time access 3 Tele-conference with GP	529 Letters to GP 1 Letter and telephone call
No. of medicines taken on first pharmacist contact (mean ± SD)	9.9 ± 4.0 (Range 1 to 22)	13.3 ± 4.7 (Range 2 to 29))	9.9 ± 4.0 (Range 1 to 22)
Total MAI before pharmacist case management (mean ± SD)*	11.9 ± 10.4 (Range 0 to 67)	17.57 ± 14.46 (Range 0 to 79, n=560)	12.00 ± 10.80 (Range 0 to 63, n=528)
Total MAI after pharmacist case management (mean ± SD)*	0.2 ± 1.1 (Range 0 to 11)	1.11 ± 2.53 (Range 0-18, n= 560)	0.27±1.22 (Range 0 to 14, n=528)
Number of clinical interventions identified (week 1) (mean ± SD)	2.4 ± 1.4 (Range 0 to 7)	3.6 ± 2.1 (Range 0 to 12)	2.8± 2.3 (Range 0 to 12)
Total number of clinical interventions from baseline to review completion tx (mean ± SD)	2.7 ± 1.7 (Range 0 to 8)	3.7 ± 2.3 (Range 0 to 12)	2.8± 2.3 (Range 0 to 12)
% Clinical Interventions Eadon Self-Grade ≥4	95.4	83.3	96.1

Table 2: Results for Patients who were Case Managed in NHSCT and WHSCT Care Homes (2015/16)

* $p<0.001$ Paired Samples Wilcoxon Signed Rank test

experience and leadership to help guide the development and roll out. Medicines adherence forms a new MOOP work stream; this Trust based service is presently being developed and refined and is subject to ongoing evaluation having been initially informed by pilot work that was also originally funded by the DHSSPSNI Regional Innovations in Medicines Management fund.[15] A medicines optimisation case management approach has again been adopted for this service which is being delivered to patients

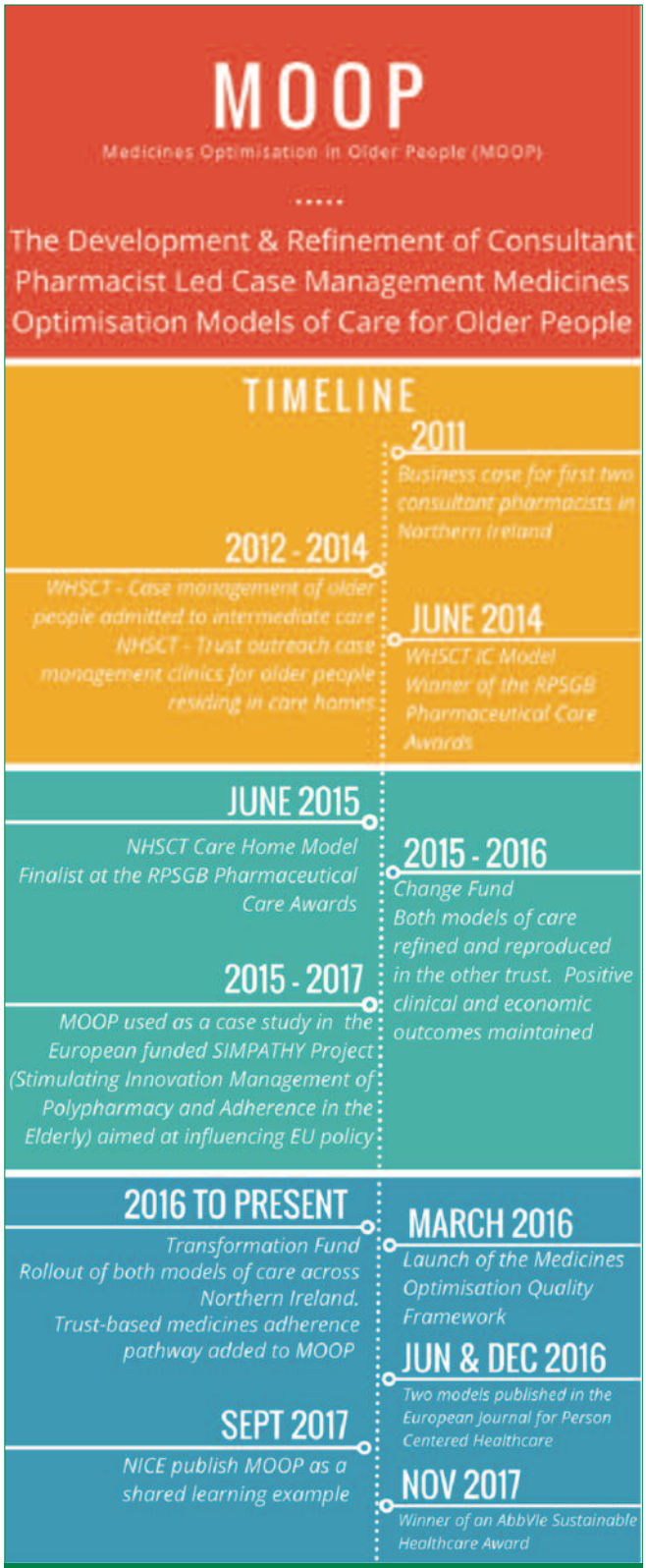

Figure 4: The MOOP Journey and Timeline 2011 to 2017

with suspected adherence issues which are further explored via a home-based comprehensive adherence assessment.

There has been an extensive period of recruitment into the regional MOOP service with the ongoing establishment of the intermediate care, care home and adherence medicines optimisation models across Northern Ireland. Having learned from the benefits of team working across two Trusts during delivery of the 'change fund' work, the aim is to now establish and maintain a regional standardised approach across the entire province. The first regional MOOP meeting was held in October 2017 where the MOOP models were described to new staff, with plans to make this an annual event. The teams communicate both informally on a continuous ad hoc basis, and formally at monthly meetings with the consultant pharmacists and project manager. A MOOP steering group has overseen the work since 2012; with the move from pilots to a permanent regional commissioned service, this will provide a more strategic as opposed to operational steer to the direction of travel and future vision.

The models do 'fit' well into each Trust but some gaps and differences have been identified which will require further refinement and exploration. For example, one Trust has a scattering of individual patient beds located in care homes and also the patient's home as opposed to defined intermediate care cohorts. Pilot work will need to be performed to establish issues and benefits of delivering the general intermediate care model to patients who are geographically scattered in this manner. Although work has focused on the development of the adherence, care home and intermediate care services the consultant pharmacists continue to horizon scan and identify gaps in the entire healthcare landscape and challenge current structures and service provision.

Data Collection and Evaluation

There is a requirement for ongoing data collection and evaluation of the MOOP services for several reasons including:

- informing the development of new services
- informing the refinement of existing services
- meeting commissioner expectations of, mainly quantitative, outcomes
- ensuring we meet the expectations of all service users, especially our older patients.

Data collection has been robust and labour intensive with it taking up to 18% of pharmacist time during the 'change fund' project work in 2015/16. Permanent commissioned service delivery cannot reasonably enable this amount of time to be devoted to data collection, therefore moving forward there will be refined data capture periods with focus on the outcomes reflective of pharmacy intervention. Experience has also shown that our extrapolated data has been acceptably similar to that when it has been collected for every individual patient. The most recent data capture period was a four-week period in January 2018 with this cohort being followed up for 12 months post-completion of case management.

Changing Roles

Since early 2017, GP federations in Northern Ireland have been provided with Department of Health funding to recruit Practice Based Pharmacists (PBPs). At present around 200 PBPs are in post with recruitment continuing into 2019/20 with the ultimate aim that all GP practices will have a PBP. The introduction of the PBP role is welcomed by the MOOP service and has led to a natural and beneficial increase in communication between the secondary and primary care pharmacy services. The care home model of communication has, in response to the PBP presence in GP practices, evolved further with the care home case management pharmacists recently reporting closer joint working in response to their case management, recommendations, clinical interventions and follow-up. This now requires a formal mechanism with further definition of the roles and responsibilities of each pharmacist, also including that of community pharmacists, as the MOOP services further embeds and refines in response to an ever-changing healthcare landscape.

The creation of clinically focussed medicines optimisation cross sectoral roles within MOOP has resulted in a new and stimulating career pathway for hospital pharmacists in Northern Ireland which can ultimately lead to appointment at consultant pharmacist level. The intensive consultant pharmacist-led case management approach across the primary/secondary care interface has met the challenges and recommendations made in several government strategies making the transition from pilot to commissioned service a recognised necessity rather than just a desire or potentially 'good idea.'

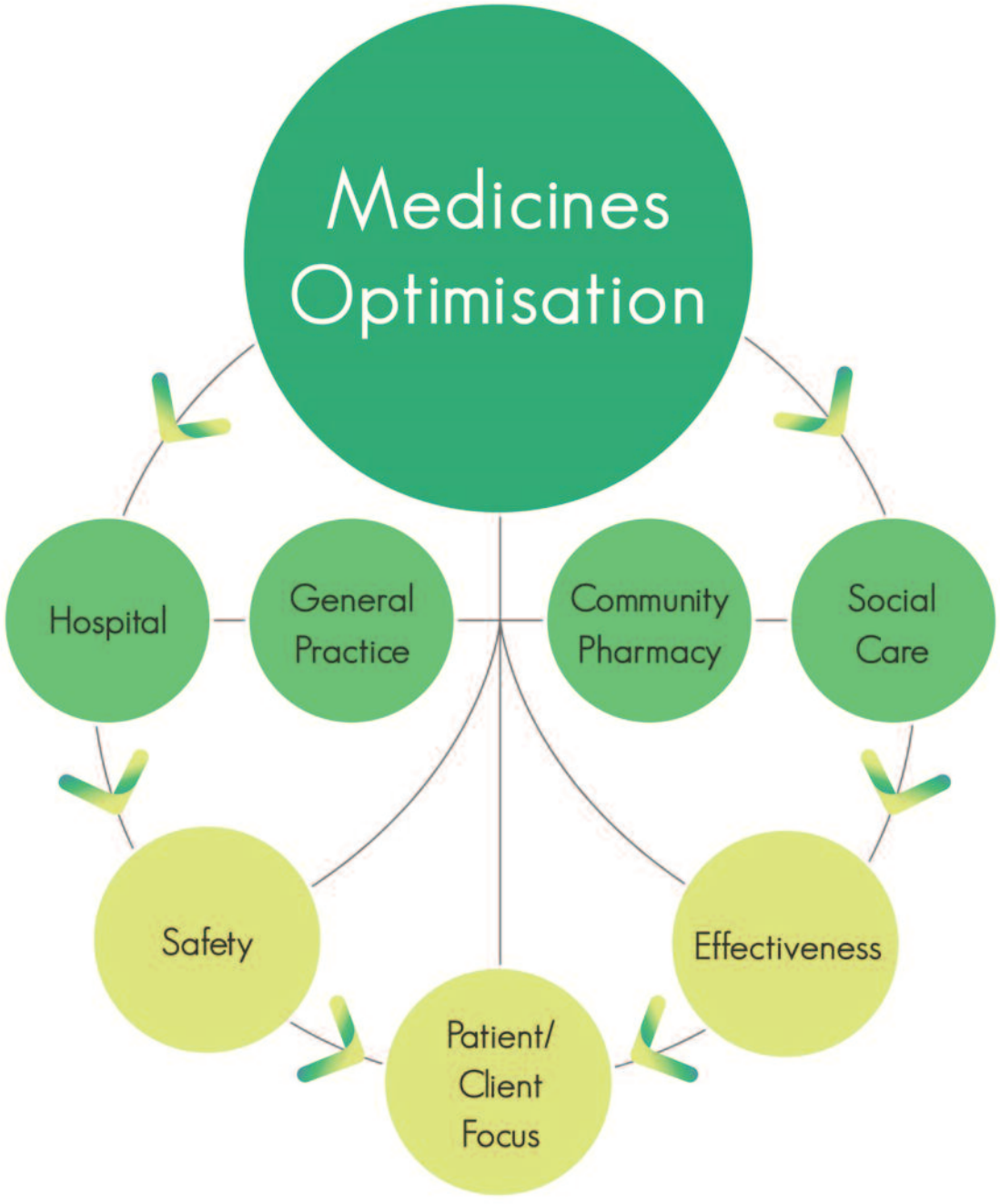

Figure 5: The Northern Ireland Medicines Optimisation Model

The approach, challenges overcome and lessons learned by the MOOP team as outlined here may be adapted and applied to other NHS services that need to be tested, refined and integrated into a transformational health service.

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Declaration of interests

The author has no declarations of interest to make.

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