

WENTWEST CLINICAL PHARMACIST PROJECT: EVALUATION

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1.1 EXECUTIVE SUMMARY

Western Sydney Primary Health Network, WentWest, has committed to identifying service gaps and commissioning solutions in the areas of population health, chronic disease and aged care. The WentWest non-dispensing pharmacist project was commissioned as a result of a proposal supporting the use of a non-dispensing pharmacist as part of the general practice team (1). Initially WentWest made funds available to the Hills, Blacktown and Mt Druitt Doctors associations to implement a clinical pharmacist pilot. In addition WentWest provided resources to assist in the consultation, commissioning and project management of the pilot.

The stated objectives for the programme were to integrate pharmacists with general practice, to support the implementation of the Integrated Care and Patient Centred Medical Home, to foster collaboration and to demonstrate the impact of a non-dispensing pharmacist model.

It was proposed that patients be identified using the Pen Clinical Audit Tool (PENCAT) and include patients with multiple conditions, patients taking five or more medications, patients recently discharged from hospital, patients who have had a significant change in their medication regimen and patients with a General Practice Management Plan (GPMP) or eligible for a GPMP.

In evaluating the pilot the initial objective was to focus on de-prescribing, medication optimisation and the impact on risk factors such as HbA1C% and blood pressure and patient-reported symptom scores. This evaluation includes qualitative interviews of pharmacists, GPs and practice staff and quantitative data collected by the project pharmacists. Case studies, provided by pharmacists, were used to demonstrate the activities conducted. The evaluation has shown that in the opinion of both pharmacists and GPs the service is well received by patients and that the service model has produced beneficial clinical outcomes for patients.

The primary recommendation is that the non-dispensing pharmacist project be extended, for which funding has now been provided for this to occur, with greater standardisation to improve the ability to draw conclusions from the study data. The standardised activities and ensuing data collection forms with primary process and outcome indicators have been agreed with participants and the PHN.

1.2 INTRODUCTION

A systematic review by Tan et al in 2013(1) provided evidence that the integration of a non-dispensing pharmacist in a general practice setting was associated with improvements in patient clinical outcomes including the resolution of medication related problems, improvements in HbA1c% in diabetic patients (mean HbA1C% reduction of 0.88 (95%CI -1.15 to -0.62 p<0.001) in intervention group), achievement of blood pressure (BP) targets in hypertensive patients (intervention patients displayed a mean reduction in systolic BP of -5.72mmHg (95%CI -7.05 to -4.39 p<0.001), and a mean reduction of diastolic BP of -3.47mmHg (95%CI -4.35 to -2.58 p<0.001)) and an improvement in low density lipoprotein (LDL) levels (intervention group displayed mean reductions in LDL-cholesterol by 18.72 mg/dL (95%CI -34.10 to -3.36 p<0.017) in patients with hypercholesterolaemia.

In 2015 the Australian Medical Association proposed to the Commonwealth Government to integrate non-dispensing pharmacists into general practice with the aim of reducing hospitalisations due to medication misadventure and reducing utilisation of medication.(2) This proposal highlighted the results of a Deloitte Access Economics Report which outlined that the use of non-dispensing pharmacists would result in a cost benefit ratio of 1.56, that is for every \$1 invested in the program it would generate \$1.56 in savings to the health system.(3)

The WentWest non-dispensing pharmacist pilot has been undertaken to assess the benefits of incorporating a non-dispensing pharmacist into the general practice team based on the established project goals of the improvement of the use of medicine, reducing adverse drug events and better co-ordination of patient care. UTS: Pharmacy at the Graduate School of Health agreed to assess the outcomes of this pilot using both qualitative and quantitative methods. WentWest made funds available to the Hills, Blacktown and Mt Druitt medical practice associations to implement the clinical pharmacist pilot. The participating sites were located in Castle Hill, Quakers Hill, Seven Hills, two practices in Blacktown, Riverstone, Glenwood, two practices in Mt Druitt and Rooty Hill.

In designing the service to be funded WentWest together with Allied Health and GP Leaders undertook extensive exploration of literature available of examples of integrating pharmacists in the general practice environment. This provided clear direction about the types of activities that could be undertaken and their effectiveness.

1.21 Description of Current Service

WentWest together with the Divisions of General Practice recruited five pharmacists, however one left during the pilot phase of the project. The remaining four are currently employed across fourteen surgeries employed between four to thirty nine hours per week. The pharmacist activities were determined at the surgery level and activities varied between surgeries and patients.

An initial pharmacist consult was estimated to take between 30-60 minutes and typically included a complete medication history, a medication record reconciliation, an adherence assessment, a review of relevant laboratory tests and addressing any patient concerns regarding their medication. The pharmacist would then suggest recommendations to the GP and patient to optimise the patient's medication regimen. In some cases, and in addition to medication review activities, patients requiring assistance with chronic disease management including COPD, asthma, heart failure, diabetes were also referred to the pharmacists. When requested, the pharmacists also assisted with pain management and palliative care reviews.

1.22 Study Aims

The aims of this study were to:

- evaluate the data collected by the participating pharmacists in the first 12 weeks of the pilot program;
- gather and analyse qualitative feedback from pharmacists and GPs on the current model;
- make recommendations for future improvement of the current project model and procedures.

1.3 METHOD

Both qualitative and quantitative data was collected and analysed as part of this evaluation. Qualitative data was collected from participating pharmacists, GPs and practice staff. In addition a descriptive analysis of the quantitative data collected by the pharmacists during their patient consultations was conducted. Several interesting case studies have also been to support the data analysis (Appendix 1).

1.31 Sample

All four currently participating pharmacists were interviewed by the UTS researcher using semi structured interviews to gather feedback about the project including professional activities, barriers and facilitators. The pharmacist who left the project was not available for interview. In addition five participating GPs were interviewed to gain their input and suggestions for improvement of the pilot program. Appendix 2 and 3 outline the questions used during the qualitative interviews. Due to time constraints the UTS researcher was able to interview only five of the approximately 20 participating GPs.

1.32 Data Analysis

Qualitative analysis was conducted to describe current project activities and to identify barriers and facilitators for the service. The quantitative data was collated from the various participating sites using a data collection form (data collection fields are outlined in Appendix 4) and common fields were analysed between practices to allow for identification of potential trends and quantification of study outcomes.

1.4 RESULTS

1.41 Qualitative feedback from pharmacists

Several themes were identified as a result of the qualitative interviews.

Patient Identification and Recruitment:

This process varied between clinical pharmacists and between surgeries and in some cases was adapted over the course of the project when pharmacists or general medical practitioners identified potential improvements.

Some pharmacists identified that initial methods of recruitment, including using the PENCAT identification tool and having surgery staff contact patients, led to patient resistance and caused patients to decline the service. This in turn meant that several pharmacists identified that they had several weeks at the beginning of the project with very few patients booked. One pharmacist considered the patient resistance to being booked-in may have been as a result of the practice staff not clearly understanding the potential benefits of a pharmacist consult. The perception was that there was an inability to positively explain and recommend the service to the patient. As a result the pharmacist identified that they be more involved in the recruitment process.

Pharmacists suggested that the most successful identification and recruitment procedure was when the pharmacist reviewed the GPs patient list for the day, identified patients who

would benefit from the clinical pharmacist service and then booked them into see the clinical pharmacist prior to their GP appointment. This method resulted in greater success and was the recruitment and booking procedure finally adopted by three of the four pharmacists.

Another recruitment method adopted was when the GP identified the patients who would benefit from the service during the patient appointment and referred them to the pharmacist. This method had the limitation that the patients often would not have their medication, affecting the pharmacist's ability to conduct the medication review.

At another practice patients, with polypharmacy and chronic conditions such as COPD and diabetes, were separately identified by both the pharmacist and surgery staff. One pharmacist identified that hepatitis C patients were an additional patient cohort requiring the clinical pharmacist service. These patients were booked in by the receptionist for the pharmacist consult on the days the pharmacist was present at the practice.

Procedure Used: Conducting Patient Consultations

The procedure used when conducting patient consultations varied between the pharmacists and practices as did the reason for referral. As there was no clear guideline or procedure for pharmacists to follow, they each focused on different areas.

There were several activities conducted by all pharmacists and others conducted by one or two pharmacists. These included:

- adherence checked using Morisky Scale (all pharmacists)
- review of medication list - complete medication history including complementary medications (all pharmacists)
- check for drug/drug Interactions, drug/disease state interactions/adverse drug reactions (all pharmacists)
- If patient had asthma medications with them a review of the inhaler technique (all pharmacists)
- Ordering and reviewing lab tests (HbA1c%, creatinine levels, INR, digoxin levels etc) (all pharmacists)
- If patient was a diagnosed asthmatic checked Asthma Symptom Score (not done by all pharmacists)
- If patient was diabetic – checked if they have a blood glucose (BG) monitor and reviewed use (not done by all pharmacists)
- Patient BP checks (not done by all pharmacists or at all sites)

One pharmacist solely focused on medication review. Another pharmacist stated that their particular aim was to reduce doses where appropriate, remove unnecessary medications, to optimise therapy where possible and to clean up the patient's medication record so it accurately reflected current therapy. At some surgeries the clinical pharmacist also conducted telephone reviews of medication use - especially when there was new therapy or a recent change to therapy. The clinical pharmacist at one surgery also helped conduct the Diabetic Group Education Sessions in combination with the exercise physiologists and dieticians.

Record of consultation:

In most surgeries (all but one) the pharmacist had access to the surgery software although often the pharmacist would require an administrative staff member to log them in. These pharmacists recorded the results of their consultation in the practice patient software and on the data collection spreadsheet (data collection fields are outlined in Appendix 4). Unfortunately more than one version of the project data collection spreadsheet was in use by the clinical pharmacists so the same data were not consistently recorded.

Follow up procedures post consultation:

Follow up procedures varied between surgeries, for example some pharmacists did not follow patients up while others booked in patients for regular review. In determining which patients to follow up, some pharmacists identified patients with adherence issues, those not responding to therapy or with recent changes in therapy and patients requiring chronic disease state management. A limitation to follow up was that the pharmacists were uncertain that there would be sufficient time in the 12 week pilot to book patients in for follow up consults.

Communication of consultation recommendations:

In most practices pharmacists were given priority access to the GP after their patient consultation so that they communicated the results of the consult in a collaborative way with the patient, pharmacist and GP present. However some practices did not follow this procedure. Both pharmacists and general practitioners identified this three-way collaboration as one of the strengths of the project and concluded that it was rewarding for all the parties involved. One pharmacist identified that the impact of not having this three-way consultation meant that they were not always able to record the recommendations accepted by the GP.

Barriers and Facilitators

From these interviews a number of barriers and facilitators for the service were identified.

Pharmacist identified barriers

All pharmacists stated that patients were initially resistant to the clinical pharmacist services apparently due to a lack of understanding of the clinical pharmacist role and its potential value. Patients were reported to have often stated that they did not want to make an extra visit to the general practice.

Most pharmacists identified that initially surgeries were hesitant to collaborate with a pharmacist and this was evidenced by a lack of patients booked in. Pharmacists also identified that there was sometimes a lack of communication between the clinical pharmacist and surgery staff and this led to difficulties in implementing the program. Most pharmacists identified an initial lack of a professional relationship with the GPs as a barrier and stated that it took several weeks of consultations to establish the pharmacist's clinical credibility. Some pharmacists stated that GPs were resentful about the cost of the consultation room and the practice software used by the pharmacist. Some pharmacists found that the GPs were resistant to the pharmacist recommendations especially due to a lack of understanding of the pharmacist's professional role.

Pharmacists listed a lack of administrative support as a barrier, with one pharmacist stating that they had not been paid for two months and several pharmacists mentioning that the lack of mentoring or supervision as barriers to their integration in the practice. Most pharmacists identified that uncertainty around program timelines reduced pharmacist effectiveness as they were unsure if they would be around for patient follow-up.

Pharmacist identified facilitators

One pharmacist stated they thought if the doctor recommended the service, patients were much more likely to participate. Other pharmacists mentioned the need for patients to be educated about the potential benefits of a pharmacist consultation. Several pharmacists identified that supportive practice nurses and surgeries often facilitated the identification of patients who would benefit from the pharmacist intervention.

Most pharmacists considered that after the GPs saw the value of the clinical pharmacist, the integration of the clinical pharmacist was more productive and satisfying for the GPs and the clinical pharmacist. All pharmacists identified that a good professional relationship between the pharmacist and GP was crucial. All pharmacists also stated that when GPs were cooperative and open minded it facilitated the process.

One pharmacist found that there was better collaboration between the pharmacist and the GPs once the relationship has been developed and the pharmacist's value was recognised. Most pharmacists felt that the more hours they spent at a surgery, the more effective they were as the surgery started to truly collaborate. Most pharmacists stated that the collaboration works best if the patients see the pharmacist prior to seeing the GP rather than the other way around. One pharmacist felt that the access to the GP allowed the pharmacist to have instant feedback on their recommendations and to tailor their future recommendations to better suit the practice.

1.42 Qualitative feedback from general practitioners

GP overall impressions of the project

A number of themes were identified as a result of the semi-structured interviews conducted with the five GPs.

Most GPs were positive about the benefits of having a pharmacist in the surgery and agreed that it improved communication and collaboration. For example one GP stated "The skills of pharmacists are a natural complement to those of the GP." GPs also agreed that having the pharmacist in the surgery could have a positive impact on patient outcomes and they highlighted that they would like the available pharmacist's hours to be increased to allow for a greater impact.

Training of pharmacists prior to the project was identified by two of the five GPs as an issue. In particular the GPs wanted pharmacists trained in the surgery systems and to be reassured that they were competent in performing any clinical activities.

Most GPs identified that the booking and referral process needed to be performed by the pharmacist, with one stating "Adhoc referrals don't work well, pharmacists need to book patients in advance." (GP1).

Roles for pharmacists identified by GPs

The opinions of GPs varied in regards to the pharmacist's role. Some GPs were interested in expanding the scope of the pharmacist's role within the practice team, whereas others would like to restrict their practice to medication review and counselling. The activities identified by GPs that pharmacists should complete included medicines review, medication reconciliation, adherence and compliance assessment, patient medication education, dose optimisation and post hospital discharge counselling. Some GPs thought that pharmacists also had a role to play in chronic disease management.

Another role identified was where the pharmacist acted as a medication information source for the GP. For example “I asked the pharmacist to review a patient’s medication for a possible cause of hyponatraemia”.

Some of the possible chronic disease management activities identified included asthma education especially the correct use of devices, developing an asthma action plan, heart failure education including developing a diuretic action plan and heart failure medication management, chronic obstructive pulmonary disease (COPD) management including devices education, developing a COPD action plan, smoking cessation counselling, sleep hygiene counselling, INR monitoring and management of hepatitis C patients using pharmacist-based protocols.

When asked if they accepted the clinical pharmacist to review and recommend lab tests there was some variation in GP response. Some GPs were supportive for pharmacists to recommend lab tests but stated that sometimes the GP would decide it was not appropriate due to the GP’s knowledge of the patient history. In contrast one GP wanted the pharmacist to have the ability to order lab tests independently using a practice-based protocol.

Most of the GPs accepted the pharmacists conduct clinical assessments such as BP measurement and spirometry as long as they had been trained, were assessed as competent and the activities had been sanctioned by the team. One GP thought these activities were better conducted by practice nurses and asked “Are pharmacists qualified and competent?”

Barriers and Facilitators

From these interviews a number of barriers and facilitators for this service were identified.

GP identified barriers

One GP stated that patients with chronic disease are already overwhelmed and don’t feel they need a new service which would lead to patient resistance. The same GP stated that some patients who had a previously bad experience with HMR were less likely to be open to a pharmacist consultation.

Several barriers relating to the general practice were identified including a lack of:

- funds for the ongoing employment of pharmacists
- government support for the integration of pharmacists in general practice
- room availability in the surgery
- an item number to bill under the MBS or funding through the PHN for the pharmacist.

One GP stated that any expansion of the pharmacist's role was a slippery slope that will lead to a diminishing of the GPs funding, and that they are already under funding stress. Another GP suggested that GPs don't always understand the role of the clinical pharmacist or the benefits to patient care that they provide. One GP also expressed concern about the lack of a professional relationship with an unknown pharmacist.

One GP found that "good" pharmacists were hard to find and not available to work in the surgery as they are often employed elsewhere in addition to their practice role. Several GPs stated that community pharmacists see the non-dispensing pharmacist role as an encroachment on their turf and that general practitioners often don't want to jeopardise the current working relationship they have with their local community pharmacists.

GP identified facilitators

Most GPs stated that patients responded well to the clinical pharmacist and that over time the pharmacist becomes an important part of the practice team. The role of the PHN working together with groups of GPs was a critical organising point to both initiate the project as well as to ensure it was applicable to local circumstances. Several GPs identified that patients benefit the most when they are contacted in advance and bring all their medications to the surgery.

They suggested that when the practice team is accepting and open to collaboration, the pharmacist is better able to perform their role. A strong professional relationship was established when the pharmacist attended practice meetings and is seen as an integral member of the team.

A strong local GP organisation was identified by one GP as an important facilitator as it is important in recruiting pharmacists and supporting the project. Several GPs identified that the GP should help to build trust between the patient and pharmacist and address any patient resistance. An example given by two GPs suggested that GPs should conduct a "warm handover" to introduce the pharmacist and establish their professional standing with patients.

The GPs identified several facilitators relating to the clinical pharmacist including: that the clinical pharmacist should have a holistic patient centred approach; that a clinical pharmacist in the surgery allowed for an increased rate of medication review; that the pharmacist's continued presence allowed for ongoing medication review and follow up that helped support patient adherence and identify other medication related issues.

All GPs identified that pharmacists must be properly trained to perform the role effectively. This training should include practice support training for the pharmacists provided by the

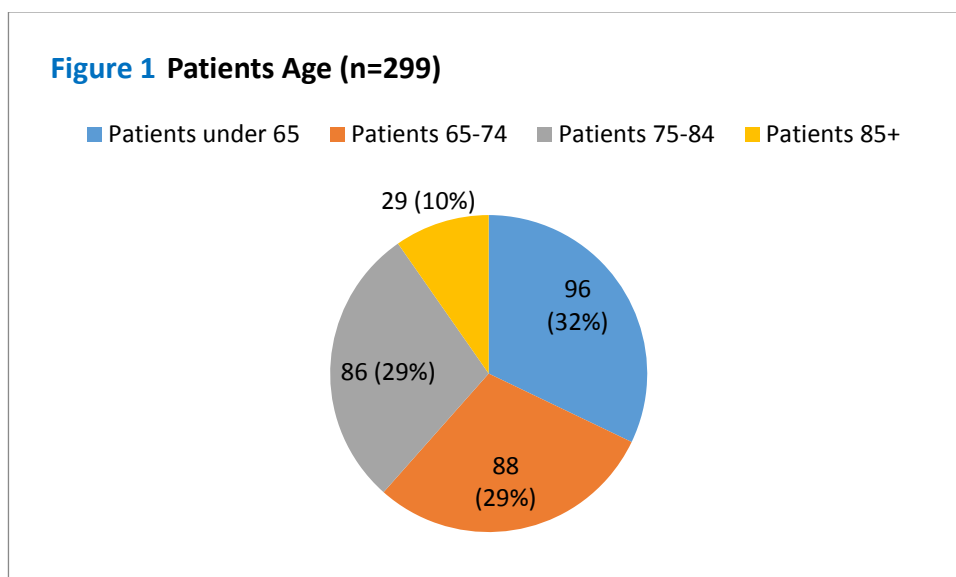
primary health network so that pharmacists are able to properly use the practice software and systems.

All GPs stated that the pharmacist should have excellent communication skills and that this helped to build trust within the team. Most GPs identified that the pharmacist needs to proactively identify and book patients in order to ensure that patient identification and recruitment is effective.

1.43 Quantitative Results

Patient Demographic Data

Data was collected on 299 patient consultations. The average patient age was 69.5 (SD: 12.1) years (Figure 1).



The average number of medications (both prescription and non-prescription) per patient was 9.6 (SD: 4.0). For the 111 patients who had comorbidities recorded, the average number of patient comorbidities was 6.9 (SD: 2.6).

Patients were selected for pharmacist consultation for a number of reasons (Table 1), with the majority being identified due to polypharmacy.

Table 1. Criteria for patient selection

	Number	%
>5 medications	171	57
Asthma/COPD management	25	8
Adherence	23	8
Diabetes management	20	7
Suspected ADR	21	7
Pain management	14	5
Inadequate response to treatment	12	4
Patient request	6	2
Recent hospital discharge	4	1
New patient to surgery	2	1
Patient education	1	0
For a diuretic action plan	1	0
Total	299	100

The pharmacists made a total of 807 recommendations [mean: 2.7 (SD: 1.9) per patient] of which 354 (44%) were recorded as actioned by the GP (Table 2).

One clinical pharmacist did not consistently record the number of their recommendations accepted by the GP so this reduced the percentage. The four pharmacists who recorded the number of their recommendations accepted had an overall acceptance rate of 90%.

Table 2 Recommendations recorded by pharmacist (n=807)						
Pharmacist	Hrs/wk	Patients (n)	Recommendations			
			Made (n)	Average (SD)	Accepted (n)	Accepted %
CP1	9	39	103	2.6 (2.0)	97	94
CP2	34	188	415	2.2 (1.8)	Not recorded	Not recorded
CP3	8	39	168	3.6 (1.4)	121	91
CP4	2	12	43	4.3 (1.4)	39	72
CP5*	4	21	78	3.7 (1.6)	72	92
Total	57	299	807	2.7 (1.9)	354	44
CP= Clinical Pharmacist						
Average = Average recommendations made/patient						
*CP5 did not complete the full 12 week trial period						

A wide variability in the number and type of dose adjustment recommendations and the number of medication discrepancies detected per patient between pharmacists was observed.

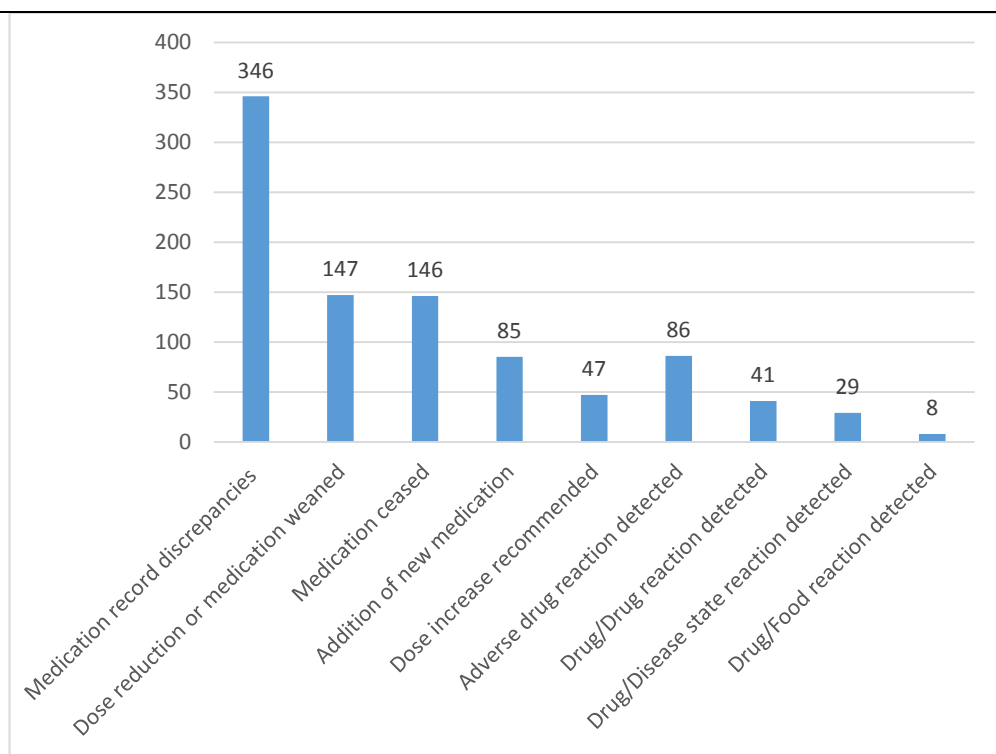
Table 3 Pharmacist interventions (n=745)

Pharmacist	Med Discrepancies *	Meds De-prescribed ≠	Dose Reduction ◇	Meds Weaned **	Dose Increase ≠≠
CP1	73	25	10	12	8
CP2	126	80	104	Data not collected	55
CP3	41	36	5	3	8
CP4	86	27	2	6	4
CP5	20	5	3	2	5

* Medication discrepancies equated to the difference in number of medications between the patient clinical records and the number of medications actually taken.
 ≠ Medications de-prescribed included medications that were recommended for cessation by the pharmacist.
 ◇ Dose reduction was the number of medications recommended for a one off dose reduction by the pharmacist.
 ** Medications weaned included the number of medications that were recommended to be gradually reduced with view to permanent dose reduction or cessation.
 ≠≠ Dose increase was the number of medications recommended for an increase in dose.

Overall the majority of pharmacist interventions were related to identifying medication record discrepancies, de-prescribing, a change in dose required and the identification of potential adverse drug reactions (Figure 2).

Figure 2. Medication related problems detected (n=935)*



***This number is greater than the number of recorded pharmacist recommendations as not all medication related problems detected were recorded as recommendations**

1.44 Discussion and Recommendations

The pilot phase of the project was used to develop and refine the project procedures, with pharmacists adjusting their practice in response to their observations and feedback from participating practices and patients. As a result the project pharmacists adapted recruitment, consultation, recommendation and follow up procedures and processes to improve the pilot study outcomes during the 12 week pilot program. In the qualitative interviews one GP expressed the importance of the pharmacist attending the weekly practice meetings and another GP stated that the pharmacist needed to have increased hours at the surgery to improve their integration into the practice. These views are supported by Rathbone et al (4) who explored inter-professional collaboration between pharmacists and GPs and highlighted that the frequency of interaction between the pharmacist and GP is important in enhancing collaboration. Rathbone further stated that the professional credibility of the pharmacist and that communication between pharmacists and general practitioners should be both reactive (referral based) and proactive (scheduled interactions through regular meetings.) Dolovich et al (5) highlighted the need for inter-professional education initiatives between physicians, pharmacists and other members of the general practice team to facilitate the success of the development of pharmacist-physician collaboration.

It was evident that the pharmacists and participating practices had received minimal to no training and insufficient information about the project prior to its commencement. Several sites stated that they had difficulty recruiting patients to participate and that both patients and practice staff had limited understanding of the role and benefits of a clinical pharmacist. The results of the qualitative interviews, where one GP expressed concern about the pharmacist's ability to conduct chronic disease management activities, demonstrated a lack of understanding of the pharmacist's role and capability. Supper et al (6) states that in order to ensure that pharmacists are successfully integrated into care practices it is essential for managers and administrators to clearly articulate the scope of the pharmacist's role and that they should ensure that the role is clearly understood by both other clinical and administrative staff within the practice.

There were marked differences in the recording of the rate of uptake of pharmacist recommendations by GPs. These differences may be a result of a number of factors including: variability in the success of collaboration in each surgery; lack of standardisation in approach; no definition of the intervention (pharmacist activities); varying clinical competency of the pharmacists; and recording methods. At this stage, although a trend to positive outcomes can be detected, no reliable conclusions can be drawn from the data.

To improve the consistency and effectiveness of the pharmacist a number of processes could be improved. Pharmacists could benefit from a training program which would include:

- the procedures to be followed by pharmacists for example: recruiting patients, patient consultation, communication of the recommendations and the identification of patients needing follow up;
- the use of practice software and the data collection spreadsheet;
- medication review and adherence assessment;
- chronic disease management tailored to agreed practice target areas including pain, COPD/asthma, diabetes, heart failure, mental health, hepatitis/ AIDS therapy, heart disease;
- review of lab results, therapeutic drug monitoring;
- BP measurement, asthma symptom score and asthma action plans, diuretic action plans;
- conflict resolution and communication.

A number of strategies should be implemented, including:

- the identification of a champion GP at each practice to facilitate the integration of the pharmacist in the practice.;
- surgeries that are fully committed to collaboration should receive funding and clinical pharmacist allocation;
- practice staff including administrative staff should be educated about the role of the clinical pharmacist and assistance should be given to establish the professional standing of the clinical pharmacist prior to the commencement of clinical pharmacy services;
- support materials should be provided to the practice including patient leaflets and posters explaining the role of the clinical pharmacist and potential benefit to patients;
- the method used for patient recruitment needs to be standardised as much as practically possible across all practices. The recruitment method that has the most support from pharmacists and GPs alike is where the pharmacist identifies and books identified patients on the day they are due to visit GP.

The pharmacist activities need to be standardised across different practices. These activities could include:

- adherence checks using the Morisky Scale;
- taking a complete medication history and record reconciliation;

- checks for drug/drug interactions, drug/disease state interactions, adverse drug reactions;
- checking asthma symptom score, asthma action plan and inhaler technique;
- reviewing blood glucose monitoring;
- monitoring BP;
- orders and reviews lab tests where required for example, HbA1c%, creatinine levels, INR, digoxin levels;
- addressing any additional reason for referral for example, pain therapy optimisation.

There should be an agreed protocol and procedure for data recording in patient records and data collection sheets, communication of recommendations and follow up of patients.

1.5 CONCLUSION

In conclusion, the pilot phase of the WentWest clinical pharmacist project has provided useful data to guide the development of an effective model for the integration of a non-dispensing pharmacist in general practice.

These observations are significantly valuable to the design and implementation of such work in the future. Many of the observations go to the centre of what is needed to effectively integrate and coordinate care and the necessary investment in consultation and change management. WentWest has undertaken much of its work in this area through the development of concepts of team based care as part of Patient Centred Medical Home initiative. There is potential to expand this should such a pilot become a permanent service. While the results from this initial evaluation suggest that outcomes relating to the reduction of medicine related problems are likely to be positive, the lack of consistency in service provision and data collection limit the conclusions. To enable the most effective evaluation standardised procedures need to be implemented and the primary process and outcome indicators agreed by stakeholders.

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APPENDIX 1: Case Studies

CP1: Case Study 1

Mrs PM a 77 year old female ex-smoker with a history of asthma, hyperlipidaemia, NIDDM, hypertension, GORD, OA of knees, Osteoporosis with fracture, supraspinatus tendinitis and sub acromial bursitis.

Mrs PM has had 2 falls in the preceding 6 months and has requested going off Lyrica.

Medications

- Cortic DS cream 1% PRN -tinea corporis
- Crestor 20mg nocte
- Metformin 1000mg a day – **only taking 500mg a day as higher doses give her diarrhoea.**
- Diamicron 60mg mane
- Karvezide 300/12.5mg mane
- Lantus Solostar 38 units nocte
- Lyrica 300mg bd
- Norspan 5mcg weekly
- Panadol Osteo 2t PRN
- Prolia 60mg 6 monthly – **yet to have the first dose**
- Seretide 250/25mcg – 2 puffs BD – **only using 1 puff a day**
- Somac 40mg a day
- Ventolin 100mcg – 2 puffs qid PRN

Nil herbal or OTC meds

Observations

BP: 120/83 mmHg Pulse: 88 Weight: 83.5Kg

Blood test results

- HbA1c 9.0
- Estimated GFR 54ml/min
- Creatinine 90 micromol/L
- Total cholesterol 4.3 mmol/L
- HDL 1.1 mmol/L
- LDL 2.1 mmol/L

- Triglycerides 2.4 mmol/L

Actions/Recommendations by pharmacist.

- Ideal HbA1c would be 7.0 to 7.5. Add Forxiga. To cease Diamicon to stave off weight gain. To stay on metformin 500mg a day for now. Side effects of Forxiga explained.
- Asthma symptom score: 12. To go back to the correct dose of Seretide to 2 puffs BD and to be reviewed in 6 to 8 weeks' time. Inhaler technique checked. Spacer provided.
- Prolia to be administered
- Trial a reduction of Lyrica to 275mg - 150mg + 75mg. Has supply of 75mg, will need script for 150mg. 275mg for a couple of weeks and further down titration by 25mg/50mg depending on how she goes.
- Caltrate and vitamin D supplementation
- Dietician referral
- Techniques to improve compliance discussed

Goals

- Aim for better diabetic control – HbA1c – 7 to 7.5.
- Aim for better asthma control
- Monitor pain control
- Encourage weight loss
- Tight control of CV risk factors – BP under control/ Aim LDL less than 1.8mmol/L - review lipid levels and Crestor dose at next visit
- Monitor compliance

CP 1: Case Study 2

Mr AB, 67 years old male non-smoker/ occasionally drinks alcohol. The patient presented to the hospital 4 days ago with left sided weakness and facial droop. He was diagnosed with stroke and was initiated on atorvastatin and clopidogrel. During the pharmacist consultation, Mr AB was concerned about his recent diagnosis and wanted to know why he was initiated on more medicines.

During the consult Mr AB revealed that he has been getting short of breath and tired more than usual.

Past medical history

- Detrusor Instability
- Migraine
- Benign prostatic hyperplasia (BPH)
- Stroke

Medications

- Deptran 25mg nocte
- Duodart 500/400mcg: 1 cap /daily
- Atorvastatin 20mg a day (*recently started at hospital*)
- Clopidogrel 75 mg a day (*recently started at hospital*)
- Sandomigran 0.5mg - 1 tab at night
- Metoclopramide 1t tds prn
- Symbicort 200/6mcg- PRN for exercise induced asthma
- Zomig 2.5mg PRN

Observations

BP: 140/93mmHg. Pulse: 74. Weight: 73Kg. Morisky score = 8

Most recent Blood test results

- Creatinine 85 micromol/L
- Estimated GFR 80 mls/min
- Sodium 143 mmol/L
- Potassium 4.3 mmol/L
- Total Cholesterol 5.6mmol/L
- Triglycerides 0.8mmol/L
- HDL 1.6 mmol/L

- LDL 3.6 mmol/L

Actions/Recommendations

- Add ACEI – Perindopril 2.5mg a day
- Increase Lipitor dose to 40mg a day
- EUC in 1 week
- Lipids in 8 weeks
- Patient Education on the all new medicines
- Dietician and exercise physiologist review
- Suggested referral to cardiologist – re: possible exertional angina

Goals

- Aim for tight control of CV risk factors
- LDL < 1.8 mmol/L
- BP 130/85 mmHg
- Review in a month's time

CP 2: Case Study 1

An 84 year old, female, Ms W with a history including cataracts, chronic kidney disease, constipation, diverticular disease, dry eye syndrome, GORD, hypercholesterolemia, osteoarthritis and osteoporosis was booked in to see the clinical pharmacist.

Ms W had asked her GP if she could take less medication, but stressed that she wants to "live as long as possible". She was referred to the clinical pharmacist to simply "go over her medications".

Medications

- aspirin 100mg one tablet in the morning
- oxybutynin 5mg half a tablet twice daily
- glucosamine 1500mg one tablet in the morning
- Systane eye drops one drop four times a day
- ramipril 2.5mg one tablet at night.

Observations

Patient complained of dry mouth and struggled to speak. She also blinked repeatedly. The pharmacist immediately suspected oxybutynin might be implicated in several of her problems- dry mouth, dry eyes and constipation. After discussion about this medicine Mrs W stated she had commenced taking the oxybutynin over ten years earlier as she had experienced some stress and urge incontinence. Mrs W now exercises regularly and has no signs of incontinence. She empties her bladder no more than once overnight. After some discussion about the potential advantages and disadvantages of continuing to use this medication, Ms W decided she would like to try and live without oxybutynin.

She was delighted to know that her dry mouth, dry eyes and constipation may all be at least a little better without this medicine. The patient's GP was happy with this outcome and decided to cease the morning dose of oxybutynin initially, and then in a week or two, cease the night time dose.

CP2 Case Study 2

In a brief intervention by the clinical pharmacist a 71 year old, overweight male, with a history including COAD and hypertension was referred for an inhaler technique check.

Medications

- fluticasone 250mcg Inhaler 1 puff twice daily
- tiotropium 18mcg one inhalation once a day
- salbutamol aerosol 2 puffs four times a day when required.

The doctor gave the pharmacist only about 3 minutes for the consult as he wanted to see and hear what we discussed, but he had to take a phone call quickly.

While the doctor was away, the patient explained that he had been on the inhalers for a couple of years, plenty of people had asked him about his inhaler technique and he knew exactly what to do.

He used them exactly as prescribed, even using a cylindrical spacer as recommended by his community pharmacist. The patient thought salbutamol was helpful, but the others didn't seem to do much. He explained his aerosol inhaler technique to me and it sounded almost perfect. He knew all the steps; shake the canister, exhale, breathe in as you puff etc. The only part he missed was holding his breath.

“Do you attempt to hold your breath after each inhalation?” the pharmacist asked. “No time”, he said. This answer was a little confusing so the pharmacist asked him to demonstrate.

He did everything correctly except his 3 breaths were executed over the course of about 3 seconds, in out in out in out, like he was in a huge hurry to blow out three birthday candles one at a time!

After a few practices at the correct technique the patient, although a little embarrassed, felt encouraged that he may be able to get around the golf course again. By the time Dr returned to the room, patient had recovered from his brief embarrassment, and felt confident in his new technique.

The pharmacist, GP and patient all then worked on a plan to escalate doses if needed and decided to delay adding a Long Acting Beta Agonist, to see if improved inhaler technique translated into improved efficacy for the current combination.

APPENDIX 2 Pharmacist interview form

Clinical Pharmacist Project-Model- Clinical Pharmacist and Practice Staff Feedback

Theme	Questions	Prompts
Patient Identification and Recruitment		Does the process differ between patients or surgeries?
Pharmacist Intervention Tailoring Follow-up		Different Medical Conditions? Common Activities? Different Surgeries?
Pharmacist/GP collaboration Systems Access Support		Different surgeries?
Identified Barriers		
Identified Facilitators		

APPENDIX 3: Clinical pharmacist project GP interview questions

What are your impressions of the clinical pharmacist project?

What roles/tasks would you like to see the clinical pharmacist provide?

Are you happy for the clinical pharmacist to review and recommend lab tests?

Are you happy for the clinical pharmacist to conduct clinical assessments? (measurement of BP/ asthma symptom score/Blood glucose?)

What barriers do you think there are that may prevent successful integration of the clinical pharmacist in the GP practice?

What facilitators have you observed that may increase the chances of successful integration of a clinical pharmacist in the GP practice?

Do you have any additional comments/suggestions that you would like implemented to improve the program?

APPENDIX 4: Data fields collected by clinical pharmacists

Criterion for referral

No of current comorbidities- **this was not recorded by all pharmacists**

No of current medicines (prescription and non-prescription)

No of discrepancies between actual medicines taken and clinical record

No of medicines weaned- **this was not recorded by all pharmacists**

No of medicines de-prescribed

Dose increased (n)

Dose decreased (n)

Morisky 8 score

Asthma symptom score - **this was not recorded by all pharmacists**

Asthma action plan (Y/N) - **this was not recorded by all pharmacists**

No of ADR identified

No of drug/drug interactions

No of drug disease interactions

No of drug/food interaction

No of recommendations by pharmacist

No of recommendations actioned upon by GP

Incorrect inhaler technique- **this was not recorded by all pharmacists**

Incorrect nasal spray technique **this was not recorded by all pharmacists**

Recommendations made- **this was not recorded by all pharmacists**