INTEGRATED PHARMACISTS WITHIN ACCHSs: SUPPORT FOR PRACTICE-BASED ACTIVITIES

REPORT TO THE PHARMACEUTICAL SOCIETY OF AUSTRALIA FOR THE IPAC PROJECT

CONFIDENTIAL

Final Report, April 2020.

Prepared by: Smith D, Couzos S, Biros E. College of Medicine and Dentistry, James Cook University, on behalf of the IPAC Project Team.

CONFIDENTIAL

Integrating Pharmacists within Aboriginal Community Controlled Health Services (ACCHSs) *to improve Chronic Disease Management* (IPAC) Project.

Correspondence:
Associate Professor Sophia Couzos
General Practice and Rural Medicine
College of Medicine and Dentistry,
James Cook University,
Townsville, Queensland, 4811
Australia

Acknowledgements:
The authors (A/Prof Sophia Couzos, Dr Deb Smith, and Dr Erik Biros) wish to acknowledge the Australian Government as the funding body supporting the implementation of the IPAC Project, under the Sixth Community Pharmacy Agreement (6CPA), with funding allocated for a Pharmacy Trial Program (PTP). The PTP will trial new and expanded community pharmacy programs which seek to improve clinical outcomes for consumers and/or extend the role of pharmacists in the delivery of primary healthcare services through community pharmacy. All PTP trials will be evaluated by an independent health technology assessment (HTA) body.

The authors also acknowledge the Project Partners and Project Team members: Ms Hannah Loller, Ms Megan Tremlett, Mr Mike Stephens, Ms Alice Nugent, Ms Fran Vaughan, Adjunct Professor Petra Buttner, the Affiliates of the National Aboriginal Community Controlled Organisation, the participating ACCHSs, IPAC pharmacists, and the IPAC Steering Committee members.

Abstract

Objective

To measure and describe the practice-based activities of pharmacists integrated within Aboriginal Community Controlled Services (ACCHSs). Integrated pharmacists delivered ten core clinical, non-dispensing roles targeting Aboriginal and Torres Strait Islander adult patients with chronic disease, health care staff and systems support (the IPAC project).

Design and participants

Eighteen ACCHSs across multiple sites in Queensland, Northern Territory and Victoria participated in a non-randomised, prospective, pre and post quasi-experimental community-based, and pragmatic study that integrated registered non-dispensing pharmacists within ACCHSs. Pharmacists delivered the ten core roles including medication management reviews, assessments of appropriateness and adherence, education and preventive health advice, participated in team-based collaborations and stakeholder liaison, conducted drug utilisation reviews and supported transitional care. Activity data was entered into a bespoke electronic pharmacist logbook to record core activities related to participants, healthcare providers, and health service systems. De-identified patient-related data was entered only for IPAC consented participants. The logbook had dual functionality for data entry and reporting. Raw activity data was downloaded from the logbook into Microsoft Excel and analysed using pivot tables with content analysis of free text questions to categorise and count responses.

Results

Twenty-six integrated pharmacists provided an aggregated 12.3 full-time equivalent (FTE) services in 18 ACCHSs, for up to 15 months, from the 2nd August 2018 to 31st October 2019. Patient-related activity included at least two self-reported patient medication adherence response surveys (N-MARS) for 1,127 participants, paired Medication Appropriateness Index (MAI) audits for 357 participants, and paired Assessments of Underutilisation (AoUs) for 353 MAI participants. A total of 639 Home Medicines Reviews (HMRs), 757 other comprehensive medication management reviews (non-HMRs), and 1,548 follow-up assessments to either a HMR or non-HMR, were also conducted. Activities provided for healthcare providers or systems-related work included provision of medicines information on 1,715 occasions, 358 occasions of formal education and training services, 47 completed stakeholder liaison plans, 3,233 contacts with community pharmacists, 1,901 occasions of transitional care services, and 26 drug utilisation reviews. Approximately 62.5% of the integrated pharmacists' time recorded in the logbook was spent on patient-related activities. .

Conclusion

Integrated pharmacists delivered the ten core roles as defined in the IPAC project exhibiting a high level of activity as documented in the logbook. Extensive collaboration and communication with other healthcare providers was evident through team-based collaboration, transitional care for participants, the development and implementation of stakeholder liaison plans and extensive contact with community pharmacy. Integrated pharmacists were pivotal as a point of contact for stakeholders involved in medicines-related care such as community pharmacists, and staff in local hospitals, rehabilitation and dialysis units. Pharmacists also provided medicines-related information, education and advice. Drug utilisation reviews and medication management reviews facilitated improvements in prescribing quality and other supports for participants. Analysis of these activities in the IPAC project provided evidence that delivery of non-dispensing pharmacist services was feasible within ACCHS settings, and contributed to the integration between the pharmacist and other health care staff, as well as enhancing communication and collaboration with community pharmacy

CONFIDENTIAL

and other stakeholders. These findings are generalizable to other Aboriginal Health Services in urban, regional and remote settings.

CONFIDENTIAL

Contents

Abstract 3
Introduction 7
Methods 8
Study setting and Intervention 8
Pharmacist Logbook 9
GHRANITE™ data 11
Core roles targeting healthcare providers and health service systems 12
Ethics approval 13
Results 14
Team-Based Collaboration 15
Medicines Information Service 16
Education and Training 18
Written information for patients 19
Written information for staff 19
Workshops conducted by the integrated pharmacist 20
Workshops in which the integrated pharmacist participated 21
Stakeholder Liaison Plans 22
Improvement areas to support better stakeholder liaison 24
Strategies and actions to support better stakeholder liaison 25
Evidence of an outcome 25
Stakeholder Liaison (Contact with Community Pharmacy) 26
Transitional Care 28
Drug Utilisation Reviews 30
Ratio of Patient and Practice Activity 31
Discussion 33
Limitations 40
Conclusion 42
Supplementary Tables 44
Table A. Total number of participants with MBS item 715 (Aboriginal and Torres Strait Islander health assessment) rebate claims. 44
Table B: Total number of MBS item 715 (Aboriginal and Torres Strait Islander health assessment) rebate claims. 44
Table C. Total number of participants with MBS item 721 (chronic disease care plan) rebate claims. 45
Table D: Total number of MBS item 721 (chronic disease care plan) rebate claims. 45
Table E. Total number of participants with MBS items (any of) 721,723, and 732 (chronic disease care plan, team-care arrangements (TCA) and review of a care plan or TCA) rebate claims. 46
Table F: Total number of MBS items (any of) 721,723, and 732 (chronic disease care plan, team-care arrangements (TCA) and review of a care plan or TCA) rebate claims. 46
Table G. Total number of participants with MBS items (any of) 735, 739, and 743 (case conference-organizing and coordinating) rebate claims. 47

CONFIDENTIAL

Table H: Total number of MBS items (any of) 735, 739, and 743 (case conference- organizing and coordinating) rebate claims....47
Table I. Total number of participants with MBS items (any of) 747, 750, and 758 (case conference- participation) rebate claims. 48
Table J: Total number of MBS items (any of) 747, 750, and 758 (case conference- participation) rebate claims. 48
Table K. Total number of participants with MBS items (any of) 10987 and 10997 (follow-up service to item 715 and 721 that includes a medication adherence check undertaken by a practice nurse or an Aboriginal and Torres Strait Islander health practitioner) rebate claims. 49
Table L: Total number of MBS items (any of) 10987 and 10997 (follow-up service to item 715 and 721 that includes a medication adherence check undertaken by a practice nurse or an Aboriginal and Torres Strait Islander health practitioner) rebate claims....49
Appendices....50
Appendix A: IPAC Project Theory of Change 50
Appendix B: The IPAC Project Logic Model for the Evaluation....51
Appendix C: Stakeholder Liaison Plan Template. 52
Appendix D: Drug Utilisation Review Template. 54
References....56

CONFIDENTIAL

Introduction

The integration of pharmacists within healthcare teams has been found to enhance quality prescribing,[1 2] biomedical outcomes,[3] and to reduce hospitalisation.[4 5] Pharmacists are increasingly becoming integrated into general practices internationally and in Australia.[6 7] There is evidence that the delivery of multifaceted interventions and interprofessional collaboration through face-to-face communication is most effective.[8],[9] A recent study undertaken in Australia found the role of practice pharmacists (defined as those integrated within mainstream general practices), included undertaking Home Medicines Reviews (HMRs) and medication reconciliation, providing medicines information, patient counselling, monitoring medication adherence, and providing advice on complementary and alternative medicines. In addition, education for staff and patients was provided, as well as medication use evaluations (internal audits of prescribing patterns of specific medications), support for clinical audits and the transition of patients from hospital back into the community, and the supply of medication only in remote Aboriginal Health services.[10] The study found that medication reviews conducted by the practice pharmacists were highly valued and led to better outcomes in relation to addressing inappropriate prescribing and patient adherence. Other studies have also reported that pharmacists in general practices conduct a variety of clinical and non-clinical roles related to medicines.[11 12]

Whilst co-location of pharmacists within general practice has enabled greater communication, collaboration and relationship building among healthcare providers,[13 14 15 16] there is little evidence that this intervention has been appropriately evaluated in Aboriginal health settings before. Other studies have shown there is an association between the degree of integration and benefits for patient-specific pharmacist services (for patients with co-morbidity). This is consistent with evidence that shows that collaborative care optimises the management of patients with chronic disease as in the 'chronic disease care model'.[17 18] Collaborative and holistic care is also a hallmark of the Aboriginal community controlled health service (ACCHS) model of care.[19]

The *Integrating Pharmacists within ACCHSs to improve Chronic Disease Management* (IPAC) Project was developed in partnership between the National Aboriginal Community Controlled Health Organisation (NACCHO), the Pharmaceutical Society of Australia (PSA) and the James Cook University (JCU) School of Medicine and Dentistry. It commenced in 2018 and explored if the integration of a non-dispensing pharmacist within ACCHSs led to improvements in the quality of the care received by Aboriginal and Torres Strait Islander adults with chronic diseases. It was anticipated that pharmacists integrated within these settings would facilitate increased access to medication-related expertise and assessments, which when coupled with increased engagement with participants, staff and other stakeholders, would result in improved services and quality use of medicines as outlined in the proposed the theory of change for the IPAC Project (Appendix A).

CONFIDENTIAL

This descriptive analysis reports on the range of activities undertaken by integrated pharmacists that primarily targeted healthcare providers and primary healthcare service systems during the IPAC project.

Methods

Study setting and Intervention

The IPAC project was a community-based, participatory, pragmatic, non-randomised, prospective, pre and post quasi-experimental study implemented in three jurisdictions: Victoria, Queensland and the Northern Territory (Trial Registration Number and Register: ACTRN12618002002268). Registered non-dispensing pharmacists were integrated within the primary health care (PHC) teams of 18 ACCHSs for up to a 15-month period with data collected between 2nd August 2018 and 31st October 2019. The integrated pharmacists delivered ten core roles through a coordinated, collaborative and integrated approach to improve the quality of care of adult participants with chronic diseases or at high risk of developing medication-related problems (e.g. polypharmacy).

Activities targeting patients included the assessment of medication management through medication management reviews (including HMRs and comprehensive reviews that did not fulfil all HMR program criteria that were designated as non-HMRs), medication adherence and appropriateness, medication-related problems, improving participants' medication knowledge and giving preventive health advice. Pharmacists at each ACCHS undertook an audit of medication appropriateness and an assessment of underutilisation, for a sample of participants at the rate of 30 participants per one full time equivalent (FTE) pro rata. Pharmacists also delivered participants with education and preventive health activities.

Activities targeting healthcare providers and systems included conducting education sessions, responding to medication-related queries, reviewing prescribing and mentoring new prescribers, participating in case conferences, undertaking drug utilisation reviews, and liaising with community pharmacies and other stakeholders to ensure continuity of care and transitional care that supported participants discharged from hospital. The Logic Model for the Evaluation outlines the roles and the expected outputs and outcomes from each role (see Appendix B).

In the initial months of the project, the integrated pharmacists focussed on establishing and building relationships, integrating into the primary health care team, and recruiting participants. During this time, pharmacists also conducted medication management reviews and baseline assessments of medication appropriateness and adherence. The remainder of the intervention period focused on participant follow-up and practice-based activities. Pharmacists received support from ACCHSs and staff, in particular Aboriginal

CONFIDENTIAL

Health Workers. They had access to clinical information systems and consulting rooms within the clinic, and their role was promoted to clients of the ACCHS. [20]

A full description of the intervention, recruitment and induction for pharmacists and ACCHSs, and participant consent processes are described elsewhere.[21] The evaluation of patient-related assessments including medication appropriate index audits, [22] assessments of medication underutilisation,[23] medication reviews, [24] and self-reported patient adherence[25] have been reported elsewhere.

IPAC Pharmacist training

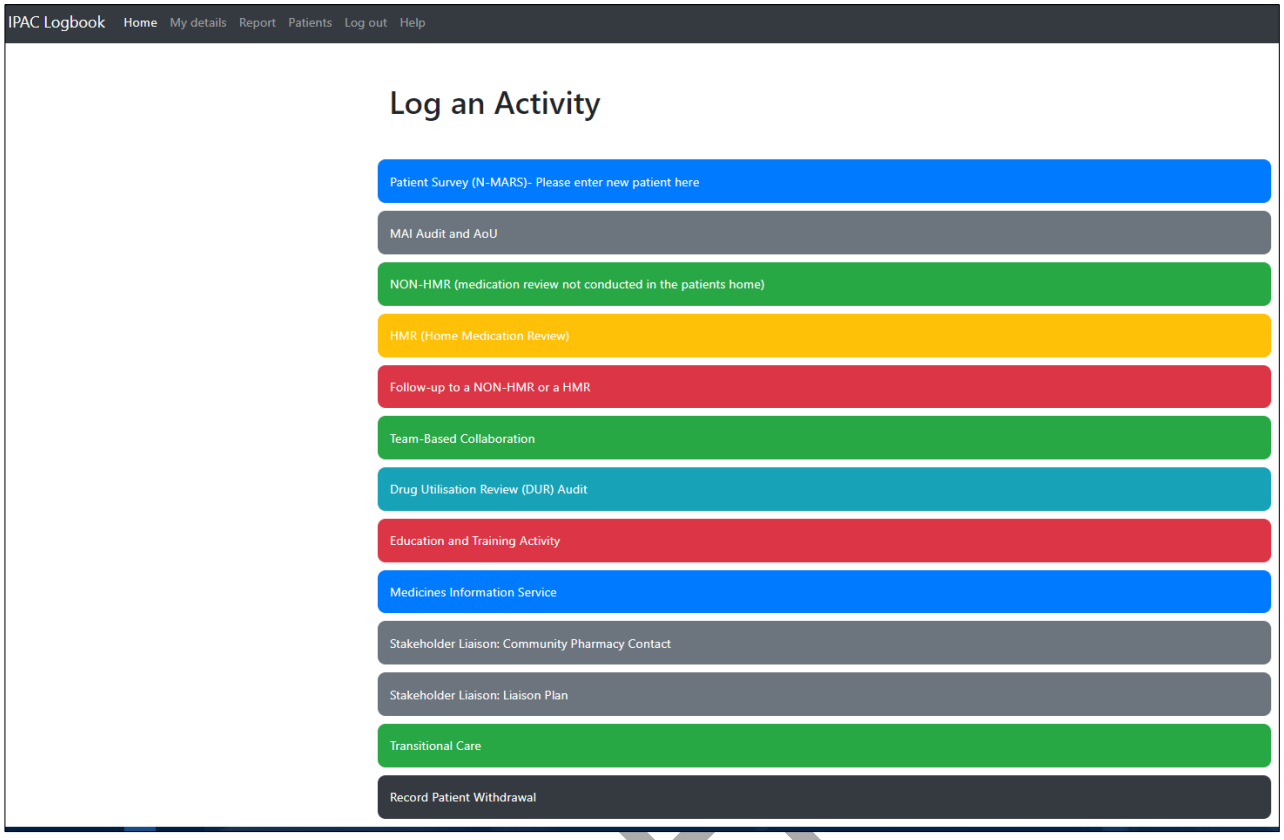
The PSA recruited 26 registered pharmacists to work within the participating ACCHSs. Pharmacists were employed at a minimum of 0.2 full -time equivalent (FTE) up to full time (1.0 FTE) and participated in an induction program that included cultural safety training prior to commencing in the ACCHSs. The majority of pharmacists participated in a two-day program in a centralised location covering the project objectives, cultural safety, the ten core roles, teamwork processes, and data recording requirements for the evaluation.[26] The program was supplemented by online learning modules. Pharmacists who commenced later in the project participated in individualised programs addressing the same topics. Ongoing support was provided for the pharmacists by the PSA Project Coordinators throughout the intervention period.[27]

Pharmacist Logbook

The integrated pharmacists recorded data on all ten core roles in a bespoke electronic pharmacist logbook. The logbook was a password protected, electronic database, accessible from any internet-connected device. It was designed specifically for the project and had dual functionality for data entry and reporting. Each core role had its own 'questionnaire' in the logbook to record all required data for that specific activity. An additional questionnaire recorded details of participants withdrawn from the study. Figure 1 depicts the logbook home page which simply provides the menu of questionnaires for each core role.The logbook design was optimised to make data collection and entry useful and efficient. The use of 'select-from' lists and multiple choice questions was maximised were possible and free text fields only used where necessary. As part of certain core role questionnaires, pharmacists were able to upload a PDF document to support their activity entry.

CONFIDENTIAL

Figure 1. Pharmacist logbook home page.



CONFIDE

Logbook system administration was managed by a JCU administrator and data custodian. Security was paramount and all users of the logbook had to be approved by the administrator, who could manage the creation and deactivation of accounts. Pharmacists were only able to access the system when the PSA had advised JCU of their commencement and details. Individual accounts were set up and pharmacists set their own password to ensure security and integrity of the system. Using a permissions-based hierarchy meant that each pharmacist could only see their own data, whereas administrators were able to run overall data reports and view the activity of each pharmacist.

The JCU administrator, with the permission and support of the logbook software developer, created a guidebook with step by step instructions and screenshots for pharmacists to help them navigate the system. Pharmacists were expected to enter data on their activity by the end of each IPAC project working day.

Raw data was downloaded from the logbook into Microsoft Excel. Descriptive data analysis was undertaken using pivot tables. A simple content analysis and counting responses categorized into themes was conducted for free text questions. To facilitate the monitoring of pharmacist activity, the JCU Team analysed high level quantitative logbook data and provided monthly reports to the project operational team on the pharmacists' levels of activity for each of the 10 core roles, including selected project targets, during the implementation phase and for the duration of the project.

GRHANITE™ data

In order to supplement information on pharmacists' team-based care activities from the logbook, certain MBS claims data extracted from health services clinical information systems was also examined. The MBS items relevant to team-based care that were examined included: 715 (Aboriginal and Torres Strait Islander health assessment); 721 (chronic disease care plan); combined 721, 723 and 732 (chronic disease care plan, team care arrangements (TCA), and review of a care plan or TCA) respectively; combined 735, 739, 743 (organizing and coordinating a case conference); combined 747, 750, 758 (participation in a case conference; and 10987, 10997 (follow-up service to item 715 and 721 that includes a medication adherence check undertaken by a practice nurse or an Aboriginal and Torres Strait Islander health practitioner). MBS items were combined as indicated due to relatively low numbers of claims for these services based on national claims data.[28]

Deidentified MBS utilization indices were extracted from CISs using an electronic tool called GRHANITE™ that required remote installation and regular extraction from IPAC sites for the term of the project.[29] GRHANITE extracted data and copied it to a JCU databank employing internationally recognised point-to-point encryption (P2PE) mechanisms to protect data in transit. MBS claims data was extracted from the JCU SQL Server database using the Navicat 15 for SQL Server (PremiumSoft) database management tool, whilst HMR, non-HMR and MRP data was extracted from the pharmacist logbook as Microsoft Excel files, and subsequently analysed using a number of statistical tools including the SPSS Statistics Premium version 24 (IBM) statistical package, Stata/MP 13.0 (StataCorp LP), and Microsoft Office 2016 (Microsoft). Nominal variables are presented as absolute and relative frequencies. Depending on their distribution, continuous variables are presented as mean and standard deviation (SD) or median and inter-quartile range (IQR), as indicated accordingly. The event rates of MBS item claims were calculated for pre and post intervention as the number of participants with claims (or the number of claims) per 100 person-years of observation. The study design of IPAC involved cluster sampling using ACCHSs as the primary sampling units. As a consequence, statistical analyses were cluster-adjusted for the design effect of ACCHSs. P-values for comparisons between baseline and end of the study for changes in nominal variables (paired data) were determined using conditional logistic regression analyses that were cluster-adjusted for ACCHSs. P-values for changes in numerical variables for participants (paired data) were derived from the cluster-adjusted confidence interval (ACCHS cluster) of the differences as this is equivalent to a paired t-test. Statistical significance was assumed at the conventional 5% level.

The number of MBS claims in the 12 months prior to participant enrolment was defined as 'baseline', whilst the number of claims from enrolment until the end of the study (31st October 2019) was defined as the intervention period or follow-up period.

CONFIDENTIAL

Core roles targeting healthcare providers and health service systems

Team-Based Collaboration

The pharmacists were integrated within the ACCHS model of care as a member of the PHC team to improve the chronic disease management of participants. Integration meant that pharmacists had identified positions and core roles, shared access to clinical information systems, provided continuous clinical care to participants, received administrative and other supports from primary health care staff, and adhered to the governance, cultural, and clinical protocols within ACCHSs as part of their shared vision. Pharmacists' recorded details of their involvement in team-based care activities in an electronic logbook, such as the type of team member or stakeholder were involved in the collaborative activity, the duration of the activity and whether or not it involved an IPAC consented participant.

Medicines Information Service

Integrated pharmacists' provided medicines-related information to clinicians and other staff within the ACCHSs including responding to Pharmaceutical Benefits Scheme (PBS) queries, information requests regarding dose titration, interactions, new and emerging drugs, drugs in stock and ad-hoc medicine queries. Data recorded in the logbook included the recipient of the information, how the request was received, the type of information provided and the clinical reference, and the time taken to complete the service. Evidence of an outcome was recorded in situations where the pharmacist was aware that the GP or other clinician had made a change to the participants therapy based upon their advice or recommendations.

Education and Training

Medication-related education sessions were provided by the integrated pharmacists for both participants and healthcare providers. The pharmacists also participated in preventive health promotion and community events. Details recorded in the logbook included the type of activity, the format in which it was provided, duration and examples of materials or resources which could be uploaded. During their training, pharmacists were encouraged to consider the health literacy of recipients, use culturally appropriate resources and co-design training with other staff members to ensure relevance.

Stakeholder Liaison Plans

A written stakeholder liaison plan aimed to support the development of relationships and networks between the ACCHS and community pharmacies, and other relevant service providers (such as local hospitals or aged care facilities) in order to facilitate communication and collaboration. It was anticipated that enhancement of communication processes with stakeholders would continue to have benefit and relevance to the ACCHSs even after completion of the project. Pharmacists were expected to develop one written plan for communication between their ACCHS and each local community pharmacy/ies, and any other relevant stakeholders. Data collected in the logbook included the identification of staff involved in the co-design of

CONFIDENTIAL

the plan, the key stakeholders, whether the plan had approval of the ACCHS CEO and the time take to develop the plan. A template was provided for the plan and when completed was uploaded into the logbook (see Appendix C). Pharmacists were also able to note or upload documentation providing evidence of any outcomes.

Contacts with Community Pharmacy

In addition to the development of the stakeholder liaison plans, integrated pharmacists recorded details of interactions with community pharmacy in the logbook including the reason for contact, whether contact was initiated by the IPAC or community pharmacist, and the method of contact used.

Transitional Care

The transitional care core role aimed to optimize medication management for participants across the continuum of care, by relaying relevant information and improving the communication of discharge summaries for medicines reconciliation. Integrated pharmacists reported details of each occasion of transitional care in which they participated including the agency they engaged with, the reason and mode of contact, and the duration of the activity.

Drug Utilisation Reviews

Integrated pharmacists also completed one or more drug utilisation reviews (DUR) at their respective ACCHSs. The World Health Organisation defines a drug utilisation review (or drug utilisation evaluation) as 'a system of ongoing, systematic, criteria-based evaluation of drug use that will help ensure that medicines are used appropriately'.[30] DURs are a comprehensive and cyclical process of review, evaluation, and intervention that play a key role in influencing and improving prescribing, and the quality use of medicines. Pharmacist training on DURs required reviews to be based on a priority issue nominated by the ACCHS. Best practice evidence or guidelines were to be used to support the DUR and a template was provided to pharmacists to assist the reporting process (Appendix D). Pharmacists uploaded the DUR report into the logbook, in addition to providing details about the initiator of the review, duration, and measures used to assess progress with this quality assurance activity within the ACCHS.

Ethics approval

Ethics approval for the project was received from four ethics committees in the three jurisdictions including St Vincent's Hospital Melbourne (SVHM) Human Research Ethics Committee (HREC), Victoria (HREC/17/SVHM/280), James Cook University HREC (mutual recognition of SVHM HREC, approval HREC/H7348), Menzies School of Health Research (HREC/2018-3072) and the Central Australian HREC (HREC/CA-18-3085).

CONFIDENTIAL

Results

Activity data was recorded in the pharmacist logbook for all ten core roles from the commencement of the first pharmacist in their respective ACCHS on 2nd August 2018 to the data close-off date of 31st October 2019. Activities were conducted by the integrated pharmacists who worked at the aggregated rate of 12.3 FTE, across 18 ACCHSs for the duration of the intervention.[31]

Pharmacists in the IPAC project recruited a total of 1,733 patients of which 1,456 had pre and post data and were included for analysis. Patient-related activity conducted by the pharmacists included a total of 789 through MAI audits and AoUs and 2,759 patient surveys (N-MARS) including baseline and end-point assessments (Table 1). A total of 639 HMRs, 757 non-HMRs, and 1,548 follow-up assessments to either a HMR or non-HMR were conducted with participants. Some participants received more than one medication management review and/or follow-up assessment. Analysis of these patient-related assessments and activities are reported elsewhere.[32 33 34 35]

With regard to activities that targeted healthcare providers and primary healthcare service systems, medicines information was provided to staff on 1,715 occasions, 358 education sessions were delivered to staff and participants, and 26 drug utilisation reviews and 47 stakeholder liaison plans were completed. During the project period, a total of 3,233 contacts with community pharmacists were recorded, along with 1,901 occasions of transitional care and 3,165 team-based collaboration activities (Table 1).

Table 1: Overview of pharmacist activity recorded in the logbook between 02/08/2018 and 31/10/2019.

Pharmacist Core Role	Number of activities
Self-reported medication adherence survey (N-MARS) *	2,759
Medication Appropriateness Index (MAI) Audits / Assessment of Underutilisation *	789
Home Medicines Reviews (HMRs) *	639
Non-HMRs *	757
Follow-up to a HMR or Non-HMR *	1,548
Team Based Collaboration (1,082 related to IPAC participants)	3,165
Medicines Information	1,715
Education & Training	358
Drug Utilisation Reviews	26
Stakeholder Liaison Plans	47
Stakeholder Liaison – Community Pharmacy Contact	3,233
Transitional Care	1,901

Source: Logbook
* See separate reports for further details.
N-MARS = NACCHO Medication Adherence Readiness Scale; HMR = Home medicines review

CONFIDENTIAL

Team-Based Collaboration

Integrated pharmacists participated in a total of 3,165 team-based collaboration activities (Table 2). General practitioners (GPs) were involved in 63.6% (n=2,013) of these activities together with pharmacists. Registered nurses were involved in 44.4% (n=1,406) of these activities, Aboriginal Health Workers in 33.9% (n=1,072) and 20.5% (n=649) involved other pharmacists. 'Others' involved in team-based activities were most commonly staff such as wellbeing workers, diabetes educators, care coordinators, clinic managers and administration staff.

The total time taken for all 3,165 team-based collaboration activities was 115,500 minutes or 1,925 hours. The median duration of each team-based activity was reported to be 30 minutes (range 15 minutes to 180 minutes).

Table 2: The number of integrated pharmacists' team-based activities, and the types of staff or external agencies involved.

Team members role	Number of team-based activities that involved this staff member (n=3,165) * N (%)
General Practitioners	2,013 (63.6%)
Registered Nurses	1,406 (44.4%)
Aboriginal Health Worker	1,072 (33.9%)
Other pharmacists	649 (20.5%)
Others***	398 (12.6%)
Allied Health Staff	566 (17.9%)
Community Agencies**	213 (6.7%)
Community Member	205 (6.5%)
Specialists	130 (4.1%)
Chief Executive Officers	114 (3.6%)

Source: Logbook

* Activities involved multiple team members, and individual activities by role exceeds the total number of activities reported.

** Examples of community agencies included hospital admissions risk program, Mission Australia, disability services, community housing, probation officers etc.

*** 'Other' participants included other health services staff such as well-being workers, diabetes educators, care coordinators, clinic managers and administrative staff.

Of the 3,165 team-based collaboration activities, 34.2% (n=1,082) involved IPAC consented participants. Some participants were recipients of multiple team-based collaborative activities. The remainder of the team-based collaborative activities recorded in the logbook did not pertain to specific IPAC participants (65.8%, n=2,083). The purpose of each team-based collaboration was not recorded, however feedback received from the PSA coordinators suggests that these activities may have included:

- Participation in discussions with clinicians and multidisciplinary case conferences, irrespective of whether the service was claimed/claimable by GPs under the Medicare Benefits Schedule (MBS);
- Working with ACCHS staff (e.g. clinic manager) to improve the pharmacist integration in the clinic;

CONFIDENTIAL

- Assistance with clinical governance activities, e.g. medicine-related policies, programs and procedures, drug imprest management;
- Assistance with medicines-related responses to, and management of, localised events of high public health significance, e.g. outbreaks of acute post-streptococcal glomerulonephritis;
- Participation in team meetings e.g. the 'morning huddle', and staff meetings;
- Support for, and participation in, preventive health and chronic disease activities e.g. National Stroke Week, Diabetes Day;
- Support for activities to improve cardiovascular risk assessment (e.g. recording smoking status in patient records); and
- Participation in ACCHS-coordinated patient group meetings such as Men's Group meetings, diabetes 'yarning' groups, Elders' group gatherings.[36]

The number of participants with the MBS item claims relevant to team-based care, and the total number of claims for these items, are shown in *Supplementary Tables A-L*. Despite pharmacists recording a large number of team-based activities in the logbook, no statistically significant change in health service utilization was observed with any of the team-based care relevant MBS item numbers when event rates were examined per 100 person-years and cluster adjusted.

This suggests that MBS claims for these activities remain outside the control of the pharmacists. Initiating an MBS claim is a health service responsibility and is a legal action that is dependent on the relevant staff member such as practice nurses or general practitioners who have authority to make these MBS claims. Moreover, MBS rules stipulate the frequency of repeat services so that for example, MBS item 715 can only be claimed once in a 9 month period, so if participants already had a 715 MBS item claimed at baseline (this applied to 61% of participants), a subsequent claim may be clinically unnecessary or the claim may be ineligible. These reasons are likely to explain why health service claims for team-based care relevant MBS items did not change for participants during the intervention period.

Medicines Information Service

Medicines information was provided by the integrated pharmacists on 1,715 occasions (Table 3). Some pharmacists recorded activities relating to the provision of information exclusively to community members (n=94) but this was excluded from the analysis as the medicines information role was intended to target healthcare providers. On some occasions there were multiple recipients of information. The majority of medicines information services were provided to GPs (66.1%, n=1,133), followed by just under a third of services that involved registered nurses (30.3%, n=520). The median duration of time for provision of a medicines information service was 15 minutes (n=1,290). Duration ranged from 5 minutes to 180 minutes.

CONFIDENTIAL

Table 3: The type of health service staff receiving medicines-related information from integrated pharmacists.

Staff member supported*	Number of services (n=1,715) N (%)
GPs	1,133 (66.1%)
Registered Nurses	520 (30.3%)
Aboriginal Health Workers	215 (12.5%)
Others**	96 (5.7%)
Community members (with another staff member)	73 (9.7%)
Specialists	14 (0.8%)
Chief Executive Officers	8 (0.5%)
Tobacco Control Officers	5 (0.3%)

Source: Logbook
* May have been multiple recipients of the one service.
** Other recipients included hospital and community pharmacists, nursing staff, diabetes educators and other allied health staff, dental staff, care coordinator, students, and administration staff, etc.

Medicines information was provided by integrated pharmacists to health service staff on a range of topics (Table 4). Of the specified topics listed, the most common was '*treatment options for a specific condition'* for 26.1% (n=447) of all medicines information services provided. Other common reasons for providing medicines-related information was to inform health services staff of drug availability on the PBS (13.4%, n=230), and dose titration advice (10.9%, n=187).

'O*ther'* types of information provided to staff members made up 29.0% (n=498) of medicines information services. Just over a third of these involved queries about specific medicines. The remainder addressed queries on medication reviews for non-IPAC patients; adverse effects; non-clinical aspects of medicines such as disposal, storage, dispensing, claiming; access to medications and pricing details; options or advice for participants; documentation requiring update; accessing programs and resources; legislation; and vaccines.

Integrated pharmacists reported whether or not they were aware if there was any evidence of an outcome (changes made in patient management) based upon their advice or recommendations. Pharmacists were able to report that an outcome was achieved following the provision of information relating to 'PBS prescribing restrictions' on 37.1% of occasions (36/97). Outcomes were also evident for 35.6% of queries relating to 'medicines access' (67/188), 33.5% of 'drug availability of the PBS' (77/230) and 33.1% in relation to 'dose titration' (60/167).

CONFIDENTIAL

Table 4: Type of information about medicines provided to staff by integrated pharmacists by the number of occasions this advice was provided.

Type of information provided *	Number of occasions that advice was provided to all staff (n=1,715) N (%)	Evidence of an outcome N (%)
Other **	498 (29.0%)	143 (28.7%)
Treatment options for a specific condition	447 (26.1%)	126 (28.2%)
Drug availability on the PBS	230 (13.4%)	77 (33.5%)
Medicines access	188 (11.0%)	67 (35.6%)
Dose titration	187 (10.9%)	60 (32.1%)
Drug interactions	131 (7.6%)	30 (22.9%)
PBS prescribing restrictions	97 (5.7%)	36 (37.1%)
New and emerging drugs	70 (4.1%)	13 (18.6%)
Pricing	65 (3.8%)	20 (30.8%)
Pregnancy/breastfeeding considerations	33 (1.9%)	5 (15.2%)
Point of care testing	17 (1.0%)	1 (5.9%)

Source: Logbook

* More than one type of information may have been provided on an occasion.

** 'Other' types of information provided involved queries regarded specific medicines; medication reviews for non-IPAC patients; adverse effects; non-clinical aspects of medicines such as disposal, storage, dispensing, claiming; access to medications and pricing details; options or advice for patients; documentation requiring updates; accessing programs and resources; legislation queries; and vaccines.

Education and Training

Integrated pharmacists provided education and training on 358 separate occasions (Table 5). The median time taken by pharmacists for the delivery of all education and training activities was 45 minutes.

In addition to the provision of written information and workshops, pharmacists also reported being involved in 'other' education and training activities such as giving information to participants verbally to support them with their medications and device techniques, informal education to staff on procedures, advice on specific medicines, IPAC project briefings, and participation in community health promotion activities and cultural events. Pharmacists indicated multiple types of education were delivered on 22 occasions (6.1%).

CONFIDENTIAL

Table 5: Type of education and training provided to staff and patients within IPAC sites by the number of occasions.

Type of education and training provided by pharmacists	Number of occasions (n=358) N (%)	Median time/activity (range)
Written information:		
for patients	77 (21.5%)	30 mins (15 mins – 180 mins)
for staff	42 (11.7%)	30 mins (15 mins – 120 mins)
Workshops:		
pharmacist conducted	84 (23.5%)	45 mins (15 mins – 180 mins)
pharmacist participated	55 (15.4%)	60 mins (30 mins – 180 mins)
Other *	122 (32.1%)	45 mins (15 mins – 180 mins)

Source: Logbook

* Other activities included giving information to patients verbally to support them with their medications and device techniques; informal education to staff on procedures, specific medicines; induction about the IPAC project; and participation in community health promotion activities and cultural events.

Written information for patients

Written information was provided to participants on 77 occasions (Table 6). Patients may have received more than one type of information during an occasion. The median time pharmacists spent preparing information for patients was 30 minutes, ranging from 15 minutes to 180 minutes. Patients were most commonly provided with information on *'how to take their medicine'* (74.0%, n=57) and *'why it is important to take the medicine'* (31.2%, n=24).

Table 6: Type of written information provided to patients within IPAC services about medicines, by the number of occasions.

Type of written information provided to patients	Number of occasions (n=77) N (%)
How to take the medicine	57 (74.0%)
Why it is important to take the medicine	24 (31.2%)
Adverse effects of medicines	20 (26.0%)
Other *	18 (23.4%)
Storage of medicines	7 (9.1%)

Source: Logbook

* Other types of written information provided to patients included details about their medications, advice on diet and lifestyle, information on specific diseases (e.g. diabetes, kidney disease, eczema); and how to use devices such as blood sugar monitors and dose administration aids.

Written information for staff

Written information was provided to staff, by pharmacists on a total of 42 occasions (Table 7). Information was most commonly provided to GPs and AHWs, both comprising 59.5% of occasions. The median time pharmacists spent preparing information for staff was 30 minutes, ranging from 15 minutes to 120 minutes.

CONFIDENTIAL

'Others' to whom information was provided included clinic managers, allied health, administration staff and students. The topic of the information provided to staff was not collected.

Table 7: Type of staff receiving written information about medicines.

Type of staff receiving written information about medicines	Number of occasions staff received written information (n=42) N (%)
General Practitioners	25 (59.5%)
Aboriginal Health Workers	25 (59.5%)
Registered nurses	16 (38.1%)
Other *	10 (23.8%)
Specialists	3 (7.1%)
Chief Executive Officers	2 (4.8%)
Tobacco control officers	1 (2.4%)

Source: Logbook

* Others to whom information was provided included clinic managers, allied health, administration staff and students.

Workshops conducted by the integrated pharmacist

The type of health services staff attending the 84 workshops conducted by the integrated pharmacist are shown in Table 8. Registered nurses attended 57 of the 84 workshops (67.9%) conducted by integrated pharmacists. The next most prevalent attendees were Aboriginal Health Workers (64.3%, n=54) and GPs (50.0%, n=42). There were a total of 600 attendees in these workshops including members of the Aboriginal and Torres Strait Islander community. Multiple staff members may have participated in each workshop. The median duration of workshops conducted by the integrated pharmacist was 45 minutes, ranging from 15 minutes to 180 minutes.

Table 8: Type of staff participating in workshops conducted by the integrated pharmacists, by the number of workshops.

Participants Roles	Number of workshops attended (n=84) N (%)	Number of participants involved (n=600) N (%)
Registered Nurses	57 (67.9%)	168 (28.0%)
Aboriginal Health Workers	54 (64.3%)	156 (26.0%)
General Practitioners	42 (50.0%)	132 (22.0%)
Others *(details not collected)*	19 (22.6%)	63 (10.5%)
Community members	9 (10.7)	67 (11.2%)
Pharmacists (other)	8 (9.5%)	9 (1.5%)
Tobacco Control Officers	2 (2.4%)	2 (0.3%)
Specialists	1 (1.2%)	2 (0.3%)
CEOs	1 (1.2%)	1 (0.2%)

Source: Logbook

CONFIDENTIAL

Workshop topics were broad ranging and were categorized into the following topic areas: diseases and related medications; use of devices and techniques for administration; quality and safety with medications; systems such as cold chain processes; accessing 'GoShare' (online consumer education resources) and managing script requests; lifestyle advice and support groups; and information about the IPAC project. The majority of sessions on diseases and related medications focused on diabetes, cardiac conditions, and chronic pain management. Sessions on use of devices and techniques covered asthma inhalers, use of dose administration aids, and insulin injection techniques.

Workshops in which the integrated pharmacist participated

Integrated pharmacists attended 55 workshops along with other health services staff. The roles of attendees who participated is shown are shown in Table 9. The median duration of workshops in which the integrated pharmacist participated was 60 minutes, ranging from 30 minutes to 180 minutes. Registered nurses were represented at most of the workshops (67.3%, n=37). A total of 583 staff were involved in these workshops. Registered nurses, AHWs, GPs, allied health and other staff also attended these workshop. Details on the roles of 'other' participants were not collected. However, some integrated pharmacists reported other participants were from external agencies and they were not aware of their roles (personal communication).

Table 9: Type of staff participating in workshops also attended by integrated pharmacists, by the number of workshops.

Participants Roles	Number of workshops attended (n=55) N (%)	Number of participants involved (n=583) N (%)
Registered Nurses	37 (67.3%)	114 (19.6%)
GPs	35 (63.6%)	88 (15.1%)
AHWs	35 (63.6%)	121 (20.8%)
Others *	22 (40.0%)	203 (34.8%)
Allied health	16 (29.1%)	34 (5.8%)
CEOs	6 (10.9%)	6 (1.0%)
Pharmacists (other)	4 (7.3%)	13 (2.2%)
Tobacco Control Officers	2 (3.6%)	2 (0.3%)
Specialists	2 (3.6%)	2 (0.3%)

Source: Logbook

* Others attendees roles were not collected.

The topics of the workshops in which the integrated pharmacist participated with other staff generally related to: professional development on a broad range of clinical topics; training on information systems (e.g. GoShare, Communicare and Quality Use of Medicines Maximised for Aboriginal and Torres Strait Islander People [QUMAX]); other projects and programs (e.g. NDIS, Sistaquit, bowel screening); or were for local cultural training.

CONFIDENTIAL

Stakeholder Liaison Plans

The integrated pharmacists completed 47 stakeholder liaison plans during the project period. Of these plans, 22 (46.8%) were completed for one ACCHS in an urban area that dealt with several stakeholders. Two ACCHSs did not complete such plans: one ACCHS opted to exclude this core role as it was not a priority for them as identified by the NACCHO project coordinator during development of the pharmacist work plan for this ACCHS; and the pharmacist at the other service commenced a plan but did not complete it prior to resigning from the project role approximately half way through their contract due to unforeseen changes in workforce capacity at the community pharmacy where the pharmacist also worked.

Of all plans completed, 95.7% were co-designed with other health services staff (n=45) (Table 10). Multiple staff members were involved in the co-design. *'Other'* staff members were reported most commonly as being involved in the design of plans (68.9%, n=31) and were identified as the clinic or practice manager, or senior medical administration staff. GPs were also involved in over half of the plans (55.6%, n=25). The reason given for the two remaining plans not being co-designed was that it was '*not a priority'* for staff.

Table 10: ACCHS staff involved in co-design of stakeholder liaison plans.

ACCHS staff involved in co-design of stakeholder liaison plans	**Total number of plans (n=47) N (%)**
Yes	45 (95.7%)
No	2 (4.3%)
Role of staff involved in the design of plans: *	**Number of plans co-designed (n=45) N (%)**
Other **	31/45 (68.9%)
General Practitioners	25/45 (55.6%)
Aboriginal Health Workers	21/45 (46.7%)
Registered Nurses	20/45 (44.4%)
Pharmacists Other	9/45 (20.0%)
Chief Executive Officers	3/45 (6.7%)
Allied Health Staff	1/45 (2.2%)
Specialists	0
Tobacco Control Officers	0

Source: Logbook

*Multiple staff may have been involved in the plans.

** Other staff engaged in the co-design of plans include clinic manager, practice manager, senior medical administrative staff, etc.

The majority of plans were implemented collaboratively with staff from community pharmacies (80.9%, n=38), followed by hospitals (17.0%, n=8, Table 11). Other stakeholders with whom plans were implemented, were staff from two dialysis units and a rehabilitation unit.

Table 11: Stakeholders involved in implementation of liaison plans.

CONFIDENTIAL

Stakeholders *	Total number of plans (n=47) N (%)
Community pharmacy	38 (80.9%)
Hospitals/s	8 (17.0%)
Other **	3 (6.4%)
Other General Practice services	0
Tertiary [healthcare providers]	0
Aged care facilities (private or other, such as run by ACCHS)	0

Source: Logbook
*Multiple stakeholders may have been involved in the plans.
** 'Other' stakeholders included staff from two dialysis units and a rehabilitation unit

An analysis of the plans uploaded into the logbook was undertaken. Five pharmacists did not use the template provided or did not answer all components in the template. On 42 plans, pharmacists documented the type of medication related services provided by stakeholders to ACCHSs. Pharmacists identified 64.3% of medication-related services were from dispensing pharmacists (n=27, Table 12). 'Other' such services were provided by 21 stakeholders (50.0%) including provision of dose administration aids (DAAs), Opioid Replacement Therapy (ORT), a Return Unwanted Medicines (RUM) type pharmacy, or dialysis services, whilst 20 stakeholders were involved in QUMAX arrangements with the service (47.6%).

All but one of the service providers preferred contact by email (97.6%, n=41), however the majority were also open to contact by phone (90.5%, n=38). Fax was an acceptable method of contact for 38.1% (n=16) of providers and 33.3% (n=14) were receptive to face to face contact.

CONFIDENTIAL

Table 12: The type of medication related services provided by stakeholders to ACCHSs, and the preferred method of contact.

Type of medication related services provided to ACCHSs by stakeholders	Total responses (n=42) n (%)
Dispensing pharmacist	27 (64.3%)
Other *	21 (50.0%)
QUMAX program arrangements	20 (47.6%)
Local hospital	8 (19.0%)
S100 provider	7 (16.7%)
S100 support provider	4 (9.5%)
HMR provider	1 (2.4%)
Tertiary referral centre	1 (2.4%)
Preferred method of contact	**Total responses (n=42) n (%)**
Email	41 (97.6%)
Phone	38 (90.5%)
Fax	16 (38.1%)
Face to face	14 (33.3%)
Letter	1 (2.4%)
IT Helpdesk Ticketing System	1 (2.4%)

Source: Logbook
HMR= Home Medicines Review
IT= Information Technology
QUMAX= Quality Use of Medicines Maximised for Aboriginal Community Controlled Health Services.
S100= Section 100 of the National Health Act (1953) for the supply of medicines for remote area Aboriginal health services.
* Other responses were the agency that provided DAAs (blister packs, MPS), Opioid Replacement Therapy, a Return Unwanted Medicines (RUM) pharmacy or provided dialysis services.

Table 13 outlines the time it took for integrated pharmacists to develop the stakeholder liaison plans, with the median time being up to 5 hours. Duration ranged from approximately 1 hour (60 minutes) to 20 hours (1,200 minutes).

Table 13: Time taken to develop the stakeholder liaison plans.

Duration	Number of plans (n=47) N (%)
0-5 hours	25 (53.2%)
6-10 hours	21 (44.7%)
11-15 hours	0 (0.0%)
16-20 hours	1 (2.1%)

Source: Logbook

Improvement areas to support better stakeholder liaison

The plans (n=47) were analysed to identify the suggested improvements in liaison or workflow between the stakeholder and the ACCHS. Two-thirds of the plans noted improvements were needed for procedures to supply DAAs and for ordering medications for the health service imprest stock. Just over half of plans identified the need for a designated contact person within the service to respond to queries. This is because

CONFIDENTIAL

stakeholders in the past had reported difficulties contacting doctors within the ACCHSs. Other suggested areas for improvement were better communication about funding schemes (Closing the Gap [CTG] and QUMAX); clearer communication about medication changes; faster communication after patient discharge from hospital; and improvements in the quality use of medicines.

Strategies and actions to support better stakeholder liaison

Over three-quarters of plans noted that a communication strategy had been implemented to address these issues. The strategies supported visits or meetings between stakeholders and other means of regular communication. The identification of a designated contact within the ACCHS to respond to queries was identified in just over half of the plans, and the development or update of resources such as contact lists and medical records was an action identified by pharmacists in just under half of the plans. Other strategies identified included ensuring relevant people were included on communication lists (for example for discharge summaries); and the establishment or updating of templates (for example, to guide communication regarding changes in blister packs), or agreements.

Evidence of an outcome

Integrated pharmacists felt their actions had led to an improvement in workflow for ACCHS staff and communication and collaboration with stakeholders as documented on just over three-quarters of the plans (36/47). While for the majority, no written evidence to support these claims was provided, pharmacists cited examples of improvements such as better engagement between the clinic and community pharmacy, fewer errors with medication supply, ordering of medications for imprest stocks was more efficient, queries were addressed in a timely manner, and issues were resolved quickly.

Verbal feedback noted from ACCHS staff was positive:

> *"Having the IPAC pharmacist in the clinic regularly has enhanced communication and services from [community pharmacy] to [ACCHS]".*

> *"Having the IPAC pharmacist onsite has been extremely beneficial for staff and patient's medication queries and for being the first point of contact with hospitals, other pharmacists and agencies outside the clinic."*

> *"Outcomes especially for patients with chronic conditions have been greatly enhanced with better medicines management and a better working relationship between [ACCHS] and [community pharmacy]."*

CONFIDENTIAL

The integrated pharmacists noted GPs appreciated them facilitating access to information and resources. Moreover, ACCHS staff expressed uncertainty about how medication related support would be managed once the IPAC project had ceased.

Thirty-four of the 47 stakeholder liaison documents noted that feedback had been received from stakeholders. Approximately half of the received feedback indicated there was better engagement between the stakeholder and the ACCHS, and that the flow of information regarding processes and medications had improved. Queries were also answered. Many community pharmacists reported that communication with ACCHSs had improved significantly with the integrated pharmacist as their main point of contact. Some stakeholders (n=7) reported improvement in communication about medications and support for patients resulting in improved medication adherence:

> *"Communication improved safety and patients' adherence; the role of the [IPAC] pharmacist can only continue to improve patients' outcomes."*

Five stakeholders also commented that collaboration had resulted in improved quality use of medicines. One stakeholder commented that while the situation had improved greatly and they were satisfied, they still had some concerns regarding whether doctors were actually seeing patients for repeat prescriptions:

> *"[I'm] happy with improvements to processes that onsite [IPAC] pharmacists have facilitated, [but] still concerned about the somewhat lack of accountability regarding patients attending appointments with doctors for scripts, but [things have] greatly improved."*

Stakeholder Liaison (Contact with Community Pharmacy)

During the project, the integrated pharmacists recorded 3,233 contacts with community pharmacy (Table 14). It was noted that one service in an urban location reported 31.4% (n=1,015) of all the occasions of contact with local community pharmacies. Approximately 69.6% of community pharmacy contacts (n=2,249) were initiated by the integrated pharmacist.

Table 14: Liaison with community pharmacy and the instigator of the contact.

Instigator of contact with community pharmacy	Number of activities (n= 3,233) N (%)
Integrated Pharmacist	2,249 (69.6%)
Community pharmacist	984 (30.4%)

Source: Logbook

CONFIDENTIAL

The primary reason for contact between the community pharmacy and the integrated pharmacist was for *'dose administration aid preparation and supply'* (n=1,544, 47.8%). This was followed by *'dispensing of medications'* (n=724, 22.4%) as shown in Table 15.

'Other' reasons for contact were stated for 12.7% (n=410) of occasions of contact. Free text responses were categorised and counted as shown in Table 16. The most common 'other' reason for contact between the integrated pharmacist and community pharmacy was *'medication reconciliation, queries, changes to packs, or to correct DAA errors' (n=150).*

Table 15: Reasons for contact between the integrated pharmacist and the community pharmacist.

Reason*	**Number of activities (n= 3,233) N (%)**
Dose-administration aid preparation and supply	1,544 (47.8%)
Dispensing of medicines	724 (22.4%)
Other **	410 (12.7%)
Participation in Home medicines reviews	266 (8.2%)
Assistance with script collection	252 (7.8%)
For delivery of medicines to the clinic	237 (7.3%)
Onsite medicines stock control	163 (5.0%)
Discuss discharge medications	140 (4.3%)
Request to source a particular medication	137 (4.2%)
Response to queries about medication related information	127 (3.9%)
For home delivery of medicines to patients	85 (2.6%)
Pricing advice	78 (2.4%)
Notify CTG script eligibility	39 (1.2%)
Patient referral for Home medicines review	18 (0.6%)
To give educational sessions to staff within the clinic	3 (0.1%)

Source: Logbook
CTG = close the gap.
** Multiple reasons may have been recorded for each stakeholder liaison contact.*
*** Other reasons – see Table 16.*

CONFIDENTIAL

Table 16: 'Other' reasons for contact between the integrated pharmacist and the community pharmacist.

Other reasons for contact	Number of 'other' reasons (n=409) N (%)
Medication reconciliation, queries, changes to packs, correct DAA errors	150/409 (36.7%)
Financial queries including QUMAX, 6CPA claims	51/409 (12.5%)
Information on DAA collection by patients and owing scripts *	47/409 (11.5%)
Patient-related issues e.g. lost scripts, advise deceased, access resources	41/409 (10.0%)
General queries about medications e.g. Disposal, storage, dispensing history	37/409 (9.0%)
Access to medication and stock supplies	27/409 (6.6%)
IPAC project related queries	13/409 (3.2%)
Miscellaneous	12/409 (2.9%)
Admin or communication procedures	12/409 (2.9%)
Education or accessing resources e.g. Sample DAAs	11/409 (2.7%)
Information on other programs (NDSS, ACCHS programs)	5/409 (1.2%)
Updating documentation re allergies, adverse effects	3/409 (0.7%)

Source: Logbook
6CPA= 6th Community Pharmacy Agreement
ACCHS= Aboriginal community controlled health service
DAA= dose administration aid
NDSS= National Diabetes Services Scheme
QUMAX= Quality Use of Medicines Maximised for Aboriginal Community Controlled Health Services.
* Owing scripts are where medications are dispensed to the patient before the pharmacy has received the actual prescription.[37]

Transitional Care

The total number of transitional care activities that integrated pharmacists participated in was 1,901 (Table 17). The median duration of this activity was 15 minutes, ranging from 15 minutes to 180 minutes. The majority of these activities involved liaison with community pharmacy (42.3%, n=804) or liaison with hospital staff (38.6%, n=733). This was followed by contact with staff from tertiary referral centres (9.4%, n=178). 'Other' agencies that integrated pharmacists liaised with included external HMR providers, community agencies, other ACCHSs or programs, nurse navigators (hospital-based coordinators of care for complex patients[38]) and other health care providers such as specialist clinicians or services.

Table 17: Agencies engaged by the integrated pharmacists to support the transitional care of patients during IPAC study period.

Type of agency	Number of transitional care activities (n=1,901) N (%)
Community Pharmacy	804 (42.3%)
Hospital	733 (38.6%)
Tertiary referral centre (e.g. renal unit)	178 (9.4%)
Other*	115 (6.0%)
External general practice	40 (2.1%)
Aged care facility	31 (1.6%)

Source: Logbook
* 'Other' agencies included external HMR providers, community agencies, other ACCHSs or programs, nurse navigators and other health care providers such as specialists or services, etc.

CONFIDENTIAL

Integrated pharmacists supported the transitional care for patients by engaging with the aforementioned agencies in order to facilitate a range of medication-related outcomes (Table 18). The most common reason for which integrated pharmacists contacted these agencies was for *'medicines reconciliation'*. This accounted for approximately a third of all interactions across the various agencies. '*Dose-administration aid preparation and supply'* was the next most common reason given to support the transitional care of patients and comprised 30.7% (n=487) of all transitional care contacts with community pharmacy. The need to discuss the patients discharge medications was the next most common reason for transitional care activity necessitating liaison with hospital staff (28.1%, n=317).

Table 18: Reasons for the integrated pharmacists contacting agencies for the transitional care of patients.

Reasons for contact *	**Type of agency contacted and number of transitional care activities (n=1,901)**				
	Hospitals n=1,127 N (%)	**External general practice n=63 N (%)**	**Tertiary referral centre (e.g. renal unit) n=340 N (%)**	**Aged care facility n=52 N (%)**	**Community Pharmacy n=1,584 n (%)**
Medicines reconciliation	385 (34.2%)	17 (27.0%)	128 (37.6%)	19 (36.5%)	528(33.3%)
Dose-administration aid preparation and supply	110 (9.8%)	9 (14.3%)	57 (16.8%)	12 (23.1%)	487 (30.7%)
Dispensing of medicines	84 (7.5%)	5 (7.9%)	28 (8.2%)	4 (7.7%)	196 (12.4%)
Assistance with script collection	48 (4.3%)	1 (1.6%)	31 (9.1%)	2 (3.8%)	114 (7.2%)
Other**	74 (6.6%)	2 (3.2%)	21 (6.2%)	5 (9.6%)	62 (3.9%)
Participation in Home medicines reviews	11 (1.0%)	9 (14.3%)	9 (2.6%)	3 (5.8%)	59 (3.7%)
Home delivery of medicines to patients	6 (0.5%)	2 (3.2%)	0 (0.0%)	0 (0.0%)	50 (3.2%)
Discuss discharge medications	317 (28.1%)	5 (7.9%)	38 (11.2%)	4 (7.7%)	45(2.8%)
Delivery of medicines to the clinic	11 (1.0%)	0 (0.0%)	4 (1.2%)	1 (1.9%)	11 (0.7%)
Response to queries re medication related info	31 (2.8%)	6 (9.5%)	9 (2.6%)	1 (1.9%)	8 (0.5%)
Medication pricing advice	3 (0.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	7 (0.4%)
Onsite medicines stock control	1 (1.0%)	0 (0.0%)	0 (0.0%)	1 (1.9%)	5 (0.3%)
Request to source a particular medication	9 (0.8%)	0 (0.0%)	3 (0.9%)	0 (0.0%)	5 (0.3%)
Notify CTG script eligibility	9 (0.8%)	1 (1.6%)	1 (0.3%)	0 (0.0%)	4 (0.3%)
Participation in team care arrangements	7 (0.6%)	0 (0.0%)	7 (2.1%)	0 (0.0%)	3 (0.2%)
Patient referral for Home Medicines Review	13 (1.2%)	1 (1.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Educational sessions to staff within the clinic	3 (0.3%)	5 (7.9%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Participation in care plan development	5 (0.4%)	0 (0.0%)	1 (0.3%)	0 (0.0%)	0 (%)
Participation in case conferences	0 (0.0%)	0 (0.0%)	1 (0.3%)	0 (0.0%)	0 (%)
Participation in clinic accreditation activity	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (%)
Participation in meetings	0 (0.0%)	0 (0.0%)	2 (0.6%)	0 (0.0%)	0 (%)

Source: Logbook
CTG = Close the gap.
*Multiple reasons per agency can be selected.
** 'Other' reasons given by pharmacists include liaising to confirm a patient's next appointment date; explaining the IPAC project; to prioritise a review of the patient; to encourage a specialist review; to confirm pathology results in relation to non-adherence; to organise home visits; to obtain a DAA etc.

CONFIDENTIAL

Drug Utilisation Reviews

Twenty-six DURs were conducted by the integrated pharmacists, who initiated 57.7% (n=15) of the review topics (Table 19). Topics for the remaining reviews were initiated by GPs (30.8%, n=8) or a clinic manager (3.8%, n=1). On two occasions the topic was selected by multiple members of the clinical team (7.7%).

Table 19: Initiator of the topic of the drug utilisation review.

Review initiator	Number of plans (n=26) N (%)
Integrated Pharmacist	15 (57.7%)
Doctor	8 (30.8%)
Multiple members of the clinical team	2 (7.7%)
Other (clinic manager)	1 (3.8%)
Nurse	(0.0%)
Aboriginal Health Worker	(0.0%)
Community Pharmacist	(0.0%)

Source: Logbook

The length of time it took for the integrated pharmacists to complete the DUR varied (Table 20). Just under a third of reviews reportedly took 21 hours or over to complete (30.8%, n=8), and just under a quarter took between 6 and 10 hours (23.1%, n=6). The median time to conduct a review was 11 to 15 hours, ranging from approximately 1 hour (60 minutes) to over 21 hours (1,260 minutes).

Table 20: Time taken to conduct the drug utilisation review.

Time taken	Number of plans (n=26) N (%)
0-5 hours	3 (11.5%)
6-10 hours	6 (23.1%)
11-15 hours	4 (15.4%)
16-20 hours	5 (19.2%)
21+ hours	8 (30.8%)

Source: Logbook

DUR Topics and Outcomes

Topics for the DUR were predominantly chosen by the integrated pharmacists after considering relevant medicines-related issues at their respective ACCHSs. Input to topics was also provided by doctors and other clinicians at some sites. Examples of topics chosen for DURs included:

- Evaluation of angiotensin converting enzyme (ACEI) or angiotensin receptor blocking (ARB) therapy and statin use in high-risk patients with chronic kidney disease (CKD)
- Thyroid stimulating hormone (TSH) and thyroxine replacement therapy prescribing

CONFIDENTIAL

- First line antibiotic use for skin infections based on local protocols
- Azithromycin use for the management of clients with bronchiectasis
- Benzodiazepines and opioids prescribed concomitantly
- Vitamin D prescribing and subsidy guidelines
- Estimated glomerular filtration rate (eGFR) versus metformin - is the dose appropriate?
- Pregabalin usage
- Patients on proton pump inhibitors (PPI) for more than one year

Following completion of the DUR, the integrated pharmacists recorded changes made at their respective ACCHSs as a result of their findings, the education they provided to staff and the recommendations made to improve quality use of medicines. Of the 26 DUR plans uploaded to the pharmacists' electronic logbook, 21 reflected a change while 5 indicated that the DUR was either ongoing or the outcome unknown due to the time remaining in the project. Some examples of outcomes were:

- The appointment of a co-coordinator targeting early intervention of high-risk patients with CKD
- Recalls added to client files to systematically review the thyroxine dose
- Revision of a skin infection clinical protocol
- Increased review of metformin dosage in patients with CKD
- New policy for the subsidy of colecalciferol including indications for testing of vitamin D status
- Reduction in the dose and number of pregabalin scripts written overall
- General Practitioners deprescribing PPIs where they were no longer indicated.

Some pharmacists conducted DURs within a short timeframe, with recommendations made but outcomes were unknown due to insufficient time remaining in the project. On some occasions 'handover' instructions were given to ACCHS staff to encourage follow-up over time beyond the completion of the project and the integrated pharmacists' tenure.

Ratio of Patient and Practice Activity

Pharmacists recorded a total of 541,545 minutes or approximately 9,026 hours spent delivering activities over the 15 month implementation phase of the project (Table 21). The ratio of pharmacist time spent delivering activities to patients versus practice-based activity was 62.5% to 37.5% respectively. Times were recorded in the logbook for the majority of the core roles. However, data on the time it took the pharmacists to conduct the patient survey (N-MARS) and stakeholder liaison with community pharmacies was estimated by the PSA project coordinators with imputation of the total time that was taken. Several limitations affecting this calculation are discussed.

CONFIDENTIAL

Table 21: Frequency of IPAC pharmacist core activities and time taken to complete them.

Category	Activity	Total number of activities	Median time per activity (mins) (range)	Total time taken (mins)	Percent of all time
Patient-related	Patient survey (includes unpaired data) *	2,759	30 (range unknown)	82,770	
	Home medicines review (HMR)	639	105 (30-180 mins)	67,095	
	Non-HMR	757	75 (15-180 mins)	56,775	
	Follow-up to a HMR or non-HMR	1,548	30 (<15-180 mins)	46,440	
	MAI and AoU (includes unpaired data)	789	60 (15-180 mins)	47,340	
	Education and Training #	124	45 (15-180 mins)	5,580	
	Team-based collaboration #	1,082	30 (15-180 mins)	32,460	
	Sub-total	***7,698***		***338,460***	**62.5%**
Practice-related	Transitional care activity	1,901	15 (15-180 mins)	28,515	
	Education and Training #	234	45 (15-180 mins)	10,530	
	Team-based collaboration #	2,083	30 (15-180 mins)	62,490	
	Medicines Information Service	1,715	15 (15-180 mins)	25,725	
	Stakeholder liaison (community pharmacy) **	3,233	15 (range unknown)	48,495	
	Stakeholder Liaison Plan ##	47	150 (60-1,200 mins)	7,050	
	Drug utilisation reviews ##	26	780 (60-1,260 mins)	20,280	
	Sub-total	***9,239***		***203,085***	**37.5%**
Total		16,937		541,545	

Source: Logbook

HMR=Home medicines review; MAI=Medication appropriateness index; AoU=Assessment of Underutilisation

* Time taken for conduct of the patient survey was not recorded. Estimated by the PSA at 30 minutes duration.

** Time taken for liaison with community pharmacies was not recorded. Estimated by the PSA at 15 minutes duration.

Education and training and team-based collaborations were allocated by the reported target audiences. Approx. a third of education activities were patient-related through provision of written information and 'other' activities e.g. verbal support, assistance with devices such as asthma puffers, DAAs, insulin techniques. Team-based collaborations relating to IPAC patients were included as patient-related activity.

Middle value of median categories was used in calculations e.g. median time for stakeholder liaison plans was 0-5 hours - 2.5 hours was used. Median time for DURs was 11-15 hours - 13 hours was used.

CONFIDENTIAL

Discussion

The IPAC project documented the comprehensive and large volume of activities undertaken by integrated pharmacists within ACCHS primary health care settings that contributed to improved prescribing quality,[39 40] improved health service utilisation,[41] and positive patient outcomes.[42] This report summarises some of the core roles and quantifies and describes activities within these roles that comprised the intervention evaluated in the project. Whilst there was individual variation within and between services in the delivery of these core roles, this report represents the aggregated summary of all such activity across 18 ACCHSs. These activities supported adult Aboriginal and Torres Strait Islander participants with chronic disease as well as health service staff in ACCHSs. The evaluation of integrated pharmacists' activity regarding medication management and prescribing quality reviews, medication adherence assessments, preventive health activity, and health service utilisation in the IPAC project is presented elsewhere.[43 44 45]

Communication and collaboration with health service staff and external stakeholders was an important function for integrated pharmacists. The types and extent of activity undertaken in the IPAC project provides evidence that supports other studies, where the integration of pharmacists within primary health care teams, enabled greater communication, collaboration and relationship building among healthcare providers, and internal and external stakeholders.[46 47 48 49] Another study found communication between GPs and pharmacists increased over time, and resulted in more collaboration and trust, with pharmacists clarifying their role and becoming more integrated into the team.[50] The integrated pharmacists provided clinicians and other health service staff with a medicines information service and education and training; supported the transitional care of patients; and participated in team-based collaborations with internal staff and external stakeholders. They also provided education and support for patients. The integrated pharmacists developed relationships, which strengthened over time and enabled collaborations to support the management of patients with chronic diseases in the IPAC project, as evidenced in other studies.[51 52]

Integrated pharmacists provided significant continuous support to health services staff throughout the project as evidenced through 3,165 occasions of team-based collaboration. Pharmacists collaborated with a range of healthcare providers, community agencies, patients and members of the community to deliver enhanced medication-related services. Pharmacists were often integrated into team-based collaborations such as case conferences for individual patients. Case conferencing is an effective way for a patient with chronic disease to have their multidisciplinary needs met and involves a medical practitioner and at least two other health or community care providers to meet and discuss the care of the patient. The Medicare Benefits Schedule (MBS) supports case conferences and the schedule fee is 100% rebatable.[53] Approximately one-third of the team-based collaborations reported by integrated pharmacists were patient-related and this activity included case conferencing. Pharmacists were however unable to influence the number of MBS

CONFIDENTIAL

claims for case conferencing or other team-based collaborative activity within ACCHSs over a 12-month period for a number of possible reasons. MBS claims need to be generated by health staff other than integrated pharmacists as pharmacists are ineligible to make these claims. The MBS rules also limit the number of claims that can be made within the 12-month window of observation for the IPAC study. So, even though pharmacists reported a large number of team-based activities, MBS claims remained outside the control of pharmacists.

Qualitative evaluation of the IPAC project revealed that team-based collaborations resulted in benefits for health service staff by having access to a medicines expert who could input into patient care through formal case conferencing, or informal meetings and conversations that did not generate an MBS rebate.[54] Informal opportunistic communication has been found by others to be the most effective method of discussing patient care as it can be timelier.[55] Others have also reported that pharmacists working in these multi-disciplinary teams can share comprehensive drug information about medicines, ensure their safe and efficient use, promote adherence, and identify medication-related problems.[56]

Most of the team-based collaborations reported by integrated pharmacists did not involve patients directly. Integrated pharmacists also participated in a range of formal and informal health service staff meetings, working groups on clinical governance activities, community health promotion events, patient support groups and other activities in response to local health issues. Being involved in a range of service-related activities enabled the IPAC pharmacist to develop relationships and integrate into the team and the health service.[57]

Integrated pharmacists also supported ACCHS staff by directly providing information on medications. GPs in particular, received information on treatment options for specific conditions, drug availability on the PBS, and had their queries about specific medicines answered. Pharmacists reported that their advice influenced prescribing and that clinicians had made changes to patient therapy based on their recommendations. The provision of advice to GPs on PBS prescribing restrictions, medicines access and treatment options for specific conditions was thought to be especially helpful. In a separate IPAC analysis, clinical staff reported it was valuable having access to the integrated pharmacist who was a medicines expert and was able to provide ad hoc advice on medicines-related topics provided through 'corridor conversations' in addition to more formally through medication management reviews.[58]

Medication-related education was also provided by integrated pharmacists through face-face workshops with healthcare staff. Pharmacists also developed written resources for health services staff, patients and community members with topics shaped by the needs of service staff and patients. Workshop topics related to diseases (such as for diabetes, cardiac conditions, and chronic pain management) and medication-use

CONFIDENTIAL

(such as how to use devices like asthma inhalers, dose administration aids, and insulin injection techniques). Health systems improvement topics were also chosen such as the quality use of medications and systems to maintain the cold chain, use of IT, as well as information about the IPAC project. In a separate qualitative evaluation, health services staff reported increased levels of knowledge on clinical conditions and medication options as having arisen specifically from integrated pharmacists input into their clinical team meetings and by providing them with education sessions.[59]

Patients value information tailored to their specific conditions.[60] It was not surprising that the most common topic for the written information provided to patients by integrated pharmacists was 'how to take the medicine'. Verbal explanation of information provided to patients was also important as was the opportunity to demonstrate and teach patients how to use their devices effectively. Patients participating in the qualitative evaluation of the project reported being more adherent to taking their medicines as a result of having a better understanding of their conditions, including what their medicines were for, how they worked, and why they needed to take them, which was explained to them by the integrated pharmacist.[61] GPs also reported that having a pharmacist as part of the health services team saved them time as the pharmacists were able to provide education to patients around their conditions and how their medications worked.[62] The participation of pharmacists in education and training workshops with other health service staff, and in health promotion and community events may have helped to integrate the pharmacist in the PHC team and enhance cultural safety. It also may have helped to build trust and relationships with patients and the community, as noted in the qualitative evaluation of the IPAC project.[63]

Collaboration between medical clinics and community pharmacy can be enhanced through better communication and work towards common shared goals. Such discussions offer staff the opportunity to understand how each other's organisations' operate, to establish rapport, and appreciate their respective expertise.[64] Stakeholder liaison plans were utilised by IPAC pharmacists to encourage such collaboration, support communication and further develop relationships between the ACCHS and community pharmacies, and other local healthcare providers with whom the service worked. Enhanced collaboration aimed to improve information transfer and optimise the patient journey.

These written stakeholder liaison plans were co-designed most commonly with clinic or practice managers, senior medical administration staff and GPs. The majority of plans developed by the integrated pharmacists targeted community pharmacy, with others created for improving collaboration with staff from local hospitals or providers of dialysis and rehabilitation services. Community pharmacists already provided a range of services to the ACCHSs and their patients including dispensing of medicines, provision of DAAs, and participation in QUMAX arrangements. The plans therefore aimed to enhance existing collaborations between the stakeholder and the ACCHS. They aimed to improve communication, avoid unnecessary

CONFIDENTIAL

duplication of services, and to take a structured approach to identifying issues as well as explore strategies to improve them.

Most of the plans involved dispensing pharmacists at the community pharmacies, and recommended improvements to procedures for supplying DAAs, and ordering medications and supplies for the ACCHS imprest stock. The need for a contact person within the service who was responsive to queries was noted in just over half of plans. Strategies to support regular ongoing communication were subsequently implemented, and contact-persons within the ACCHS were identified to better respond to queries (such as from community pharmacists).

Integrated pharmacists noted examples of improvements after implementation of these plans such as better engagement between the clinic and community pharmacy, fewer errors with medication supply, more efficient ordering of imprest stock medications, queries addressed in a timelier manner, and issues resolved more quickly. Feedback specifically on the implementation of the plan from stakeholders and ACCHS staff was positive and working relationships with stakeholders were further strengthened through the process. ACCHS staff felt communication and services from the other services providers had been enhanced, the pharmacist was the key contact and responded to queries about medicines, and outcomes for patients with chronic conditions had improved. Staff from the stakeholder organisations, particularly community pharmacists, agreed that communication had improved through having the integrated pharmacist as their main point of contact. Some stakeholders reported that better collaboration had resulted in enhanced medication reviews, improved quality use of medicines and more support for patients leading to better medication adherence.

In addition to the liaison plans, integrated pharmacists interacted with community pharmacists on a daily basis. There were more occasions of service logged for an interaction between the integrated pharmacists and community pharmacy than any other IPAC activity. Over two-thirds of the 3,233 logged contacts with community pharmacy were initiated by the integrated pharmacist. Nearly three-quarters of contacts related to communication on the preparation and supply of DAAs and medication dispensing. Community pharmacists also assisted with queries regarding a range of medicines-related topics including reconciliation, owing scripts, stock supplies, financial assistance and they received referrals from the integrated pharmacists and GP for Home Medicines Reviews. In the qualitative evaluation of the IPAC project, community pharmacists reported that IPAC pharmacists had helped with resolving medication-related problems for ACCHS clients, and had strengthened their relationship with the ACCHS. Community pharmacists also reported that the integrated pharmacist had facilitated communication between them and the GPs within the ACCHS.[65] Similar findings with general practice pharmacists have also been reported.[66] Improved

CONFIDENTIAL

relationships between the clinic and the community pharmacy facilitate a better understanding between the organisations and subsequent patient outcomes.[67]

The enhanced engagement between the ACCHS and community pharmacy was also evident with logged activity pertaining to transitional care. The most common agency engaged by integrated pharmacists for the transitional care support of patients was community pharmacy. Other health care providers, external to the health service, such as hospitals and renal units were also engaged in the ongoing care of patients across the care continuum. Combined community pharmacy and hospital contacts relating to transitional care made up 80% of the 1,901 transitional care activities logged by pharmacists. Medicines reconciliation was the main reason for such contact, explaining over a third of the interactions with staff from community pharmacy, hospitals, tertiary referral centres and aged care facilities. Just under a third of contacts with community pharmacy were in relation to DAA preparation and supply, and a quarter of contacts with hospital staff were in relation to discharge medications. This level of communication between the health service, hospitals and community pharmacy provides further evidence that effective collaboration between stakeholders is vital for optimal continuity of care for patients. Patient care is known to be adversely affected by the lack of communication and information transfer following discharge from hospital.[68] An overseas study demonstrated that collaboration between hospitals and community pharmacists and coordination of discharge information was crucial to the continuity of care for patients.[69] Medication discrepancies are common across transition of care.[70] Medicines reconciliation is an important step towards improving patient safety at transitions of care particularly for Aboriginal and Torres Strait Islander people and those with complex medication regimens.[71] A lack of communication between stakeholders was an issue identified by the integrated pharmacists in the qualitative evaluation of the IPAC project. The integrated pharmacists commonly served as a liaison between the health service and surrounding healthcare providers, including hospitals and their clinical units, and community pharmacists[72] and were well-placed to improve transitions of care and medicines reconciliation for participants.

During the IPAC Project, integrated pharmacists also conducted DURs to optimise prescribing and increase the standard of care in ACCHSs. Over half of the reviews undertaken through the project were initiated by the integrated pharmacist. Reviews were a quality improvement activity [73] and their completion resulted in prescribers making changes in the ways they used medicines. The selected topics varied across participating ACCHSs according to local priorities and context, which was evidenced by significant differences in the total time taken to conduct this activity. Numerous examples of positive outcomes to prescribing quality were reported such as deprescribing of PPIs, reduced prescriptions for pregabalin, as well as systems changes such as to practice protocols and staff deployment.

CONFIDENTIAL

The completion of DURs is time consuming and can be complex. In another report, integrated pharmacists outlined the factors which affected the outcome of the DUR at their individual health services. Turnover of key ACCHS staff at some sites led to a delay in identification of a medicines-related DUR topic of relevance, while in other sites conflicting priorities and preferences of the health service for pharmacist activities meant that the DUR was started quite late in the project with inadequate time to meaningfully assess effectiveness.[74] Project-related workload and unfamiliarity with reporting functions in the clinical information systems within the ACCHS were identified by some pharmacists as barriers to optimal completion of DURs. Medication shortages in some sites meant pharmacists were unable to accurately assess the impact of best practice recommendations made during the DUR cycle.[75]

A core requirement from the funding body was that integrated pharmacists spend 75% of their time directed towards patient-level activities (defined as medication management reviews and assessments of adherence and appropriateness).[76] Patient-level activities in this project comprised 62.5% of activities recorded including medication reviews and assessments, as well as direct service delivery to patients through education and preventive health care, and team-based collaborations identified as being patient-related (as defined in the Logic Model for Evaluation, Appendix B). This approximates the expected division of pharmacist roles, especially given that significant underreporting of actual patient-related activity occurred. For example, patient education and team-based collaboration activities (such as case conferences) although categorised for the purpose of the evaluation as practice-based activities, were critical to direct patient care as well as to the practice. Furthermore, transitional care occasions and a proportion of contacts with community pharmacy were also expected to have been related to the care of individual patients. However, the categorisation of this activity as purely practice-based also underestimated the proportion of time that pharmacists spent delivering patient-based care. In addition, time taken for patient-based activities may have been underestimated as the time able to be recorded in the logbook for these activities was limited to 180 minutes. In all, the activities undertaken by integrated pharmacists during the IPAC project closely approximated the division of core roles that were expected of them at the start of the project.

The IPAC pharmacists also focused considerably more activity on patient-based rather than practice -based activity when compared to reports of integrated pharmacists activity from other studies. A study involving a single pharmacist in a general practice setting, found pharmacist activity focused on completing medication reviews which comprised 47% of their time, whilst other patient contacts contributed an additional 1% of time.[77] Another small Australian study tracked activity of three general practice pharmacists and found patient-related activities comprised an average of 30% of the pharmacists' time (19% medication management reviews and 11% patient education and counselling). Quality of practice activities made up 37% of pharmacist time (audits, medicines information, staff education), whilst administration work made up around 34% (including 10% for evaluation) of time.[78] Whilst for the IPAC project, administration and

CONFIDENTIAL

evaluation time was not recorded and factored into pharmacist activity, feedback from pharmacists during site visits conducted by the PSA project coordinators indicated that data entry took between 1-3 hours per day. Other activities undertaken that were not recorded included time spent with non-consented patients, and non-productive time, for example, for inter-clinic travel, coordinating clinic staff such as AHWs to accompany on HMRs, arranging a staff car for visits, and waiting for patients scheduled for appointments but do not attend.[79] It also took some time at the commencement of the project for the pharmacists to settle in and ensure staff understood their role. Feedback from pharmacists throughout the qualitative evaluation provided further evidence of these challenges. It is important to note that whilst the project protocol defined 10 core roles for pharmacists which formed the foundation for the project and the evaluation, in line with community-based participatory research principles, each participating ACCHS also had the flexibility to utilise the services of the pharmacist according to service and client priorities at the local level.

Evidence collected in the qualitative evaluation of the IPAC project from GPs, other health services staff, community pharmacists, and the integrated pharmacists themselves, elaborated on the beneficial outcomes from improved stakeholder liaison, transitional care, and DURs.[80] IPAC pharmacists identified that their integration into the PHC team was facilitated by a clear definition of their core roles. Participating in a broad range of clinical and non-clinical team activities, education and training, collaborating with stakeholders for transitional care and the development and implementation of stakeholder liaison plans, helped the pharmacists to build and maintain relationships and integrate in the primary health care team and the service. ACCHS staff felt communication and services from other stakeholders had been enhanced by integrating a pharmacist into the ACCHS. The integrated pharmacist often acted as the key contact and assisted the ACCHS to respond to queries about medicines. Having the pharmacist role embedded in the primary health care team and ACCHS more broadly had numerous benefits for staff and patients and impacted positively on the holistic services provided by ACCHS, which resulted in benefits for patients with chronic conditions directly and indirectly. Staff from the stakeholder organisations, particularly community pharmacists, agreed that communication had improved through having the integrated pharmacist as their main point of contact. Some stakeholders reported that better collaboration had resulted in enhanced medication reviews, improved quality use of medicines and more support for patients leading to better medication adherence.

Separate analyses support these assessments. Integrated pharmacist activities most likely explain the improvements in the quality of prescribing,[81] [82] increased patient access to medication management reviews and improved health service utilisation,[83] improved medication adherence and self-assessed health status of patients,[84] and clinical endpoint improvements[85] as shown for the IPAC study. Improvements in prescribing quality significantly prevented potential prescribing omissions (PPOs) to high-value pharmacotherapies,[86] and improved the appropriateness of medication prescribing.[87] There was also a substantial increase in

CONFIDENTIAL

access to medication management reviews (HMR and non-HMR), and follow-up to these reviews for Aboriginal and Torres Strait Islander adults with chronic disease.[88]

The core roles implemented in the IPAC project could be included in the position description for a future expansion of integrated pharmacists working in Aboriginal primary health care settings. Similar to the recent Australian studies undertaken predominantly in mainstream settings,[89,90,91] the services provided by integrated pharmacists within ACCHSs were highly valued by health service staff, external stakeholders and patients. The IPAC project provided evidence that the implementation of similar non-dispensing pharmacy services were well received and valuable for Aboriginal peoples and Torres Strait Islanders attending ACCHSs in urban, regional and remote settings.[92] This evidence supports the generalisability of implementation of the pharmacist core roles more broadly.

Limitations

The activities recorded in the logbook are a conservative measure of the actual activities undertaken by pharmacists. A few pharmacists reported that data entry was time-consuming and they had not entered data on every activity they had undertaken.[93] Some pharmacists also reported initially there was a lack of clarity about where or how to enter certain information in the logbook for activities which did not clearly fit into one of the ten defined core roles. This may have led to some inconsistencies as to which 'questionnaire' each pharmacist selected to enter their data. This may explain why there are numerous free-text responses for some questions.

The time recorded by the pharmacists for undertaking some activities may have been underestimated as defined response options available in the logbook were capped at 180 minutes for the majority of roles. In particular the time spent on HMRs and non-HMRs recorded by pharmacists in the logbook, is likely to under-represent the total time taken for all aspects of the medication reviews, such as coordinating another member of staff (generally an Aboriginal Health Worker or Practitioner) to accompany them on the home visit, arranging ACCHS transport, locating patients in community, communicating with patients to schedule the home visit, accounting for cancellations or 'no shows'. The logbook did not capture pharmacist time spent on administration, non-clinical duties or data entry required for evaluation purposes.

Limitations to data entry may have also underestimated pharmacist reports of positive outcomes as logbook entries could not be edited once submitted. For example, some data on the outcomes of medication reviews, such as whether the prescriber accepted or declined recommendations made by the pharmacist, could not be recorded. Pharmacists were also not able to delete their own entries made in error, however pharmacists were able to advise the JCU Administrators where errors occurred and these were excluded from analysis.

CONFIDENTIAL

Each pharmacist was established with an individual logbook account to ensure security of the system and confidentiality of patient data. However, at up to three ACCHSs where two pharmacists provided services for the IPAC project, challenges were experienced in monitoring services provided by the pharmacists to 'shared' patients, and identifying which patients needed follow-up. Alternative processes were put in place by these pharmacists, generally using excel spreadsheets, to track their combined interactions with patients.[94]

CONFIDENTIAL

Conclusion

The integrated pharmacist role within ACCHSs as part of the IPAC project was comprehensive, with a large range of services delivered to health service staff, external stakeholders, patients and the community. Core practice-based roles within these primary health settings included team-based collaboration, transitional care, the development and implementation of stakeholder liaison plans, and communication and contact with community pharmacy. Pharmacists provided a medicines-related information service, education and advice, and contributed to chronic disease care through case conferences, care planning, and other team-based activity.

Integrated pharmacists were found to have interacted with community pharmacists on a daily basis with more occasions logged for such interactions than any other IPAC activity. The most common agency engaged by integrated pharmacists for supporting the transitional care of patients was also community pharmacy for the purpose of reconciling medication lists. Integrated pharmacists were well-placed to improve medication safety at patient transitions of care. Stakeholder liaison plans were predominantly co-designed with clinic managers or senior staff and targeted local community pharmacies. These plans guided improvements to communication and knowledge transfer to optimise the patient journey. Relationships between stakeholders and the health service were reinforced and community pharmacists, in particular, agreed that communication had improved particularly through having the integrated pharmacist as their main point of contact. Some stakeholders reported that better collaboration had enhanced medication reviews, improved the quality use of medicines, and supported patients to improve their adherence to medications. Pharmacists conducted drug utilisation reviews which facilitated improvements in prescribing quality on a range of topics that were a priority for their respective health service.

The integrated pharmacists developed relationships with health service staff through team-based collaborations, which strengthened over time and facilitated their integration into the team and health service. Pharmacists participated in multidisciplinary case conferencing and provided input into care plans and the management of patients with chronic diseases. The provision of medicines information through medication reviews and informal conversations was valuable for clinical staff and increased their knowledge levels on clinical conditions and medication options. Education sessions and written medicines information provided opportunities to upskill and enhance the knowledge of Aboriginal Health Workers. Integrated pharmacists also supported patients through education most frequently on how to take their medicines. Verbal explanation of information provided to patients was important, as was the opportunity to demonstrate and teach patients how to use their devices effectively.

CONFIDENTIAL

Qualitative evaluation of the IPAC project facilitated feedback from GPs, other health services staff, community pharmacists, and the integrated pharmacists themselves and provides context around these roles and their the impact.[95] Health services staff identified that the pharmacists built and maintained relationships and integrated with the primary health care team and more broadly within ACCHSs. Education sessions and medicines information provided by the pharmacist was found valuable and knowledge levels of staff had increased as a result. ACCHS staff felt communication and services from external stakeholders had been enhanced by integrating a pharmacist into the ACCHS, such as relationships with community pharmacists. Patients reported being more adherent to taking their medicines as a result of having a better understanding of their conditions, including what their medicines were for, how they worked, and why they needed to take them, which was explained to them by the integrated pharmacist.

Approximately two-thirds of activities recorded by the integrated pharmacists directly impacted patients. However, the majority of other activities had benefits more broadly and were anticipated to benefit patients indirectly. Practice-based activities are likely to have contributed to improvements in prescribing quality,[96] [97] increased patient access to medication management reviews and improved health service utilisation,[98] improved medication adherence and self-assessed health status of patients,[99] and clinical endpoint improvements[100] as shown in other reports for the IPAC study.

The core roles implemented by pharmacists in the IPAC project and the resulting benefits were highly valued by health service staff, external stakeholders and patients. The IPAC project provided evidence that the implementation of similar non-dispensing pharmacy services is generalizable to other Aboriginal Community Controlled Health Services in all settings. Future integrated pharmacist roles could include the practice-based activities described in this report.

CONFIDENTIAL

Supplementary Tables

Table A. Total number of participants with MBS item 715 (Aboriginal and Torres Strait Islander health assessment) rebate claims.

	Baseline	Intervention period	p-value*
Number of participants with a completed item:			
None	564 /1456 (38.7%)	807 /1456 (55.4%)	<0.001
One	825 /1456 (56.7%)	572 /1456 (39.3%)	
Two	66 /1456 (4.5%)	76 /1456 (5.2%)	
More than two	1 /1456 (0.1%)	1 /1456 (0.1%)	
Total number of participants with at least one completed item	892 /1456 (61.3%)	649 /1456 (44.6%)	<0.001
Total person-days of observation**	531440	413723	<0.001
Number of participants with at least one completed item per 100 person-years [95% CI]*	61.3 [52.0-70.6]	57.3 [44.5-69.7]	0.590
Rate ratio of participants with at least one completed item per 100 person-years	1	0.93	

*P-value, cluster adjusted p-value for ACCHS. P-values were determined using the . svy linearized : clogit Stata command (proportions) and using the cluster-adjusted SD from the . svy linearized : mean Stata command (means)

Table B. Total number of MBS item 715 (Aboriginal and Torres Strait Islander health assessment) rebate claims.

	Baseline	Intervention period	p-value*
Total number of completed items	960	727	
Number of completed item claims per patient	0.66	0.50	0.021
Total person-days of observation**	531 440	413 723	<0.001
Total number of completed items per 100 person-years [95% CI]*	65.9 [55.5-76.4]	64.1 [45.5-82.6]	0.833
Rate ratio of completed items per 100 person-years	1	0.97	

* P-value, cluster adjusted p-value for ACCHS and patients. P-values were determined using the . svy linearized : clogit Stata command (proportions) and using the cluster-adjusted SD from the . svy linearized : mean Stata command (means)

CONFIDENTIAL

Table C. Total number of participants with MBS item 721 (chronic disease care plan) rebate claims.

	Baseline	Intervention period	p-value*
Number of participants with a completed item:			
None	663 /1456 (45.5%)	969 /1456 (66.6%)	<0.001
One	768 /1456 (52.8%)	445 /1456 (30.6%)	
Two	24 /1456 (1.7%)	40 /1456 (2.75%)	
More than two	1 /1456 (0.1%)	2 /1456 (0.1%)	
Total number of participants with at least one completed item	793 /1456 (54.4%)	487 /1456 (33.5%)	<0.001
Total person-days of observation**	531440	413723	<0.001
Number of participants with at least one completed item per 100 person-years [95% CI]*	54.5 [43.3-65.6]	43.0 [30.8--55.0]	0.103
Rate ratio of participants with at least one completed item per 100 person-years	1	0.79	

*P-value, cluster adjusted p-value for ACCHS. P-values were determined using the . svy linearized : clogit Stata command (proportions) and using the cluster-adjusted SD from the . svy linearized : mean Stata command (means)

Table D. Total number of MBS item 721 (chronic disease care plan) rebate claims.

	Baseline	Intervention period	p-value*
Total number of completed items	819	531	
Number of completed item claims per patient	0.56	0.36	0.005
Total person-days of observation**	531 440	413 723	<0.001
Total number of completed items per 100 person-years [95% CI]*	56.3 [44.5-68.0]	46.9 [31.4-62.0]	0.270
Rate ratio of completed items per 100 person-years	1	0.83	

* P-value, cluster adjusted p-value for ACCHS and patients. P-values were determined using the . svy linearized : clogit Stata command (proportions) and using the cluster-adjusted SD from the . svy linearized : mean Stata command (means)

CONFIDENTIAL

Table E. Total number of participants with MBS items (any of) 721,723, and 732 (chronic disease care plan, team-care arrangements (TCA) and review of a care plan or TCA) rebate claims.

	Baseline	Intervention period	p-value*
Number of participants with a completed item:			
None	463 /1456 (31.8%)	683 /1456 (46.9%)	
One	122 /1456 (8.4%)	215 /1456 (14.8%)	<0.001
Two	414 /1456 (28.4%)	285 /1456 (19.6%)	
More than two	457 /1456 (31.4%)	273 /1456 (18.8%)	
Total number of participants with at least one completed item	993 /1456 (68.2%)	773 /1456 (53.1%)	<0.001
Total person-days of observation**	531440	413723	<0.001
Number of participants with at least one completed item per 100 person-years [95% CI]*	68.2 [56.2-80.2]	68.2 [48.7-87.4]	>0.999
Rate ratio of participants with at least one completed item per 100 person-years	1	1	

*P-value, cluster adjusted p-value for ACCHS. P-values were determined using the . svy linearized : clogit Stata command (proportions) and using the cluster-adjusted SD from the . svy linearized : mean Stata command (means)

Table F. Total number of MBS items (any of) 721, 723, and 732 (chronic disease care plan, team-care arrangements (TCA) and review of a care plan or TCA) rebate claims.

	Baseline	Intervention period	p-value*
Total number of completed items	2557	1800	
Number of completed item claims per patient	1.76	1.24	0.008
Total person-days of observation**	531 440	413 723	<0.001
Total number of completed items per 100 person-years [95% CI]*	175.6 [136.6-214.7]	158.8 [102.9.-214.1]	0.607
Rate ratio of completed items per 100 person-years	1	0.90	

* P-value, cluster adjusted p-value for ACCHS and patients. P-values were determined using the . svy linearized : clogit Stata command (proportions) and using the cluster-adjusted SD from the . svy linearized : mean Stata command (means)

CONFIDENTIAL

Table G. Total number of participants with MBS items (any of) 735, 739, and 743 (case conference- organizing and coordinating) rebate claims.

	Baseline	Intervention period	p-value*
Number of participants with a completed item:			
None	1415 /1456 (97.2%)	1391/1456 (95.5%)	
One	40 /1456 (2.8%)	57 /1456 (3.9%)	0.148
Two	0 /1456 (0%)	7 /1456 (0.5%)	
More than two	1 /1456 (0.1%)	1 /1456 (0.1%)	
Total number of participants with at least one completed item	41 /1456 (2.8%)	65 /1456 (4.5%)	0.154
Total person-days of observation**	531440	413723	<0.001
Number of participants with at least one completed item per 100 person-years [95% CI]*	2.8 [1.1-4.5]	5.7 [1.9-9.5]	0.123
Rate ratio of participants with at least one completed item per 100 person-years	1	2.03	

*P-value, cluster adjusted p-value for ACCHS. P-values were determined using the . svy linearized : clogit Stata command (proportions) and using the cluster-adjusted SD from the . svy linearized : mean Stata command (means)

Table H. Total number of MBS items (any of) 735, 739, and 743 (case conference- organizing and coordinating) rebate claims.

	Baseline	Intervention period	p-value*
Total number of completed items	43	74	
Number of completed item claims per patient	0.03	0.05	0.148
Total person-days of observation**	531 440	413 723	<0.001
Total number of completed items per 100 person-years [95% CI]*	3.0 [1.2-4.7]	6.5 [2.0-11.1]	0.188
Rate ratio of completed items per 100 person-years	1	2.21	

* P-value, cluster adjusted p-value for ACCHS and patients. P-values were determined using the . svy linearized : clogit Stata command (proportions) and using the cluster-adjusted SD from the . svy linearized : mean Stata command (means)

CONFIDENTIAL

Table I. Total number of participants with MBS items (any of) 747, 750, and 758 (case conference-participation) rebate claims.

	Baseline	Intervention period	p-value*
Number of participants with a completed item:			
None	1455 /1456 (99.9%)	1453 /1456 (99.8%)	
One	1 /1456 (0.1%)	3 /1456 (0.2%)	na
Two	0 /1456 (0%)	0 /1456 (0%)	
More than two	0 /1456 (0%)	0 /1456 (0%)	
Total number of participants with at least one completed item	1 /1456 (0.07%)	3 /1456 (0.21%)	na
Total person-days of observation**	531440	413723	<0.001
Number of participants with at least one completed item per 100 person-years [95% CI]*	0.1 [0-0.2]	0.3 [0-0.6]	na
Rate ratio of participants with at least one completed item per 100 person-years	1	3.9	

*P-value, cluster adjusted p-value for ACCHS. P-values were determined using the . svy linearized : clogit Stata command (proportions) and using the cluster-adjusted SD from the . svy linearized : mean Stata command (means)

Table J. Total number of MBS items (any of) 747, 750, and 758 (case conference- participation) rebate claims.

	Baseline	Intervention period	p-value*
Total number of completed items	1	3	
Number of completed item claims per patient	0.0007	0.0021	na
Total person-days of observation**	531 440	413 723	<0.001
Total number of completed items per 100 person-years [95% CI]*	0.07 [0-0.22]	0.26 [0-0.64]	na
Rate ratio of completed items per 100 person-years	1	3.85	

* P-value, cluster adjusted p-value for ACCHS and patients. P-values were determined using the . svy linearized : clogit Stata command (proportions) and using the cluster-adjusted SD from the . svy linearized : mean Stata command (means)

CONFIDENTIAL

Table K. Total number of participants with MBS items (any of) 10987 and 10997 (follow-up service to item 715 and 721 that includes a medication adherence check undertaken by a practice nurse or an Aboriginal and Torres Strait Islander health practitioner) rebate claims.

	Baseline	Intervention period	p-value*
Number of participants with a completed item:			
None	470 /1456 (32.3%)	625 /1456 (42.9%)	
One	248 /1456 (17.0%)	288 /1456 (19.8%)	0.148
Two	200 /1456 (13.7%)	167 /1456 (11.5%)	
More than two	538 /1456 (37.0%)	376 /1456 (25.8%)	
Total number of participants with at least one completed item	986 /1456 (67.7%)	831 /1456 (57.1%)	**0.020**
Total person-days of observation**	531440	413723	<0.001
Number of participants with at least one completed item per 100 person-years [95% CI]*	67.7 [58.1-77.4]	73.3 [60.3-86.1]	0.475
Rate ratio of participants with at least one completed item per 100 person-years	1	1.08	

*P-value, cluster adjusted p-value for ACCHS. P-values were determined using the . svy linearized : clogit Stata command (proportions) and using the cluster-adjusted SD from the . svy linearized : mean Stata command (means)

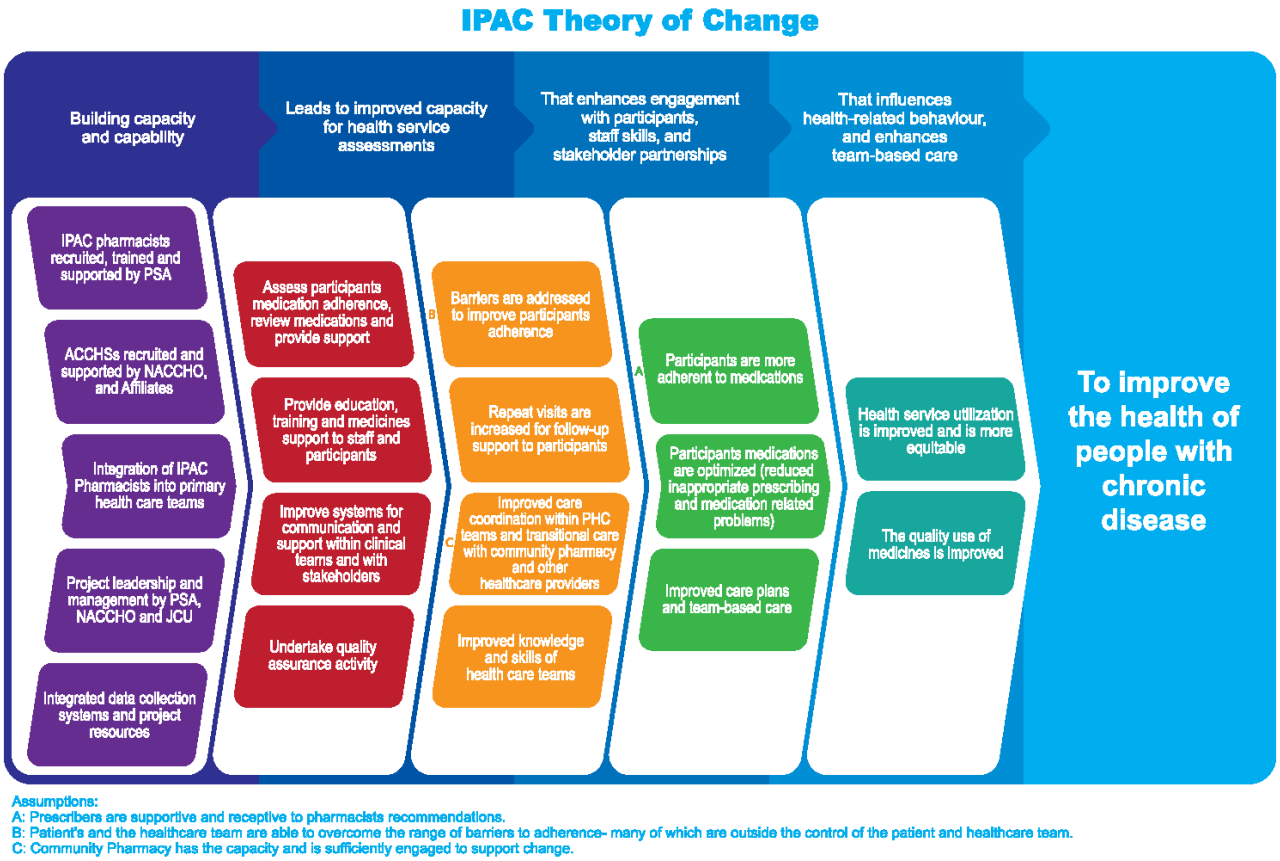
Table L. Total number of MBS items (any of) 10987 and 10997 (follow-up service to item 715 and 721 that includes a medication adherence check undertaken by a practice nurse or an Aboriginal and Torres Strait Islander health practitioner) rebate claims.

	Baseline	Intervention period	p-value*
Total number of completed items	4203	2910	
Number of completed item claims per patient	2.9	2.0	**0.035**
Total person-days of observation**	531440	413723	<0.001
Total number of completed items per 100 person-years [95% CI]*	288.7 [188.4-389.0]	256.7 [174.2-338.3]	0.602
Rate ratio of completed items per 100 person-years	1	0.89	

* P-value, cluster adjusted p-value for ACCHS and patients. P-values were determined using the . svy linearized : clogit Stata command (proportions) and using the cluster-adjusted SD from the . svy linearized : mean Stata command (means)

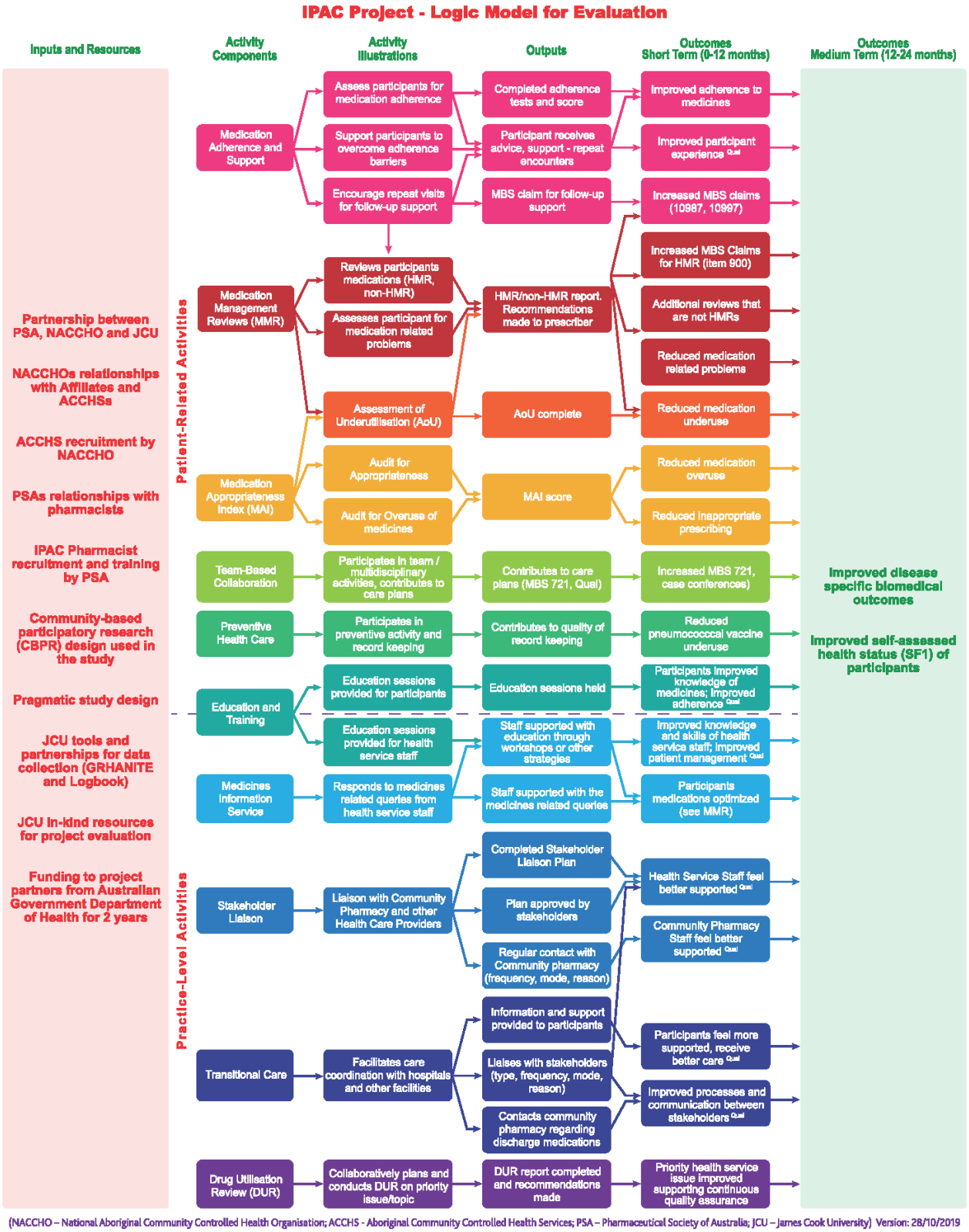
CONFIDENTIAL

Appendix A: IPAC Project Theory of Change



CONFI

Appendix B: The IPAC Project Logic Model for the Evaluation.



Appendix C: Stakeholder Liaison Plan Template.

IPAC Project - MEDICINES STAKEHOLDER LIAISON PLAN

Complete a plan for each stakeholder

Name of Stakeholder / Service Provider	
Name of primary Stakeholder contact person (include phone number)	
Type of service provider	• Community pharmacy provider _____ • Hospital _____ • Other GP service provider _____ • Tertiary referral centre _____ • Aged Care Facility _____ • Pathology provider _____ • Other (please specify):
Nature of involvement in providing medication related services to the ACCHS	• S100 provider _____ • S100 support provider _____ • QUMAX arrangement _____ • Dispensing pharmacist _____ • HMR provider _____ • Tertiary referral centre _____ • Local hospital _____ • Other (please specify):
Preferred method(s) of engagement	• Phone _____ • Email _____ • Face-to-face _____ • Other (please specify)
Outline any suggested areas for improvement in workflow/liaison	

1

Evidence of Outcome

Actions undertaken to improve workflow/liaison	
Evidence that actions have led to improvement in workflow/liaison	
Feedback from Stakeholder / Service Provider	
Feedback from ACCHS	

Date of plan finalisation: _____/ _____/ _____

Signature of Stakeholder representative: _____

Appendix D: Drug Utilisation Review Template.

IPAC Project Drug Utilisation Review Report

Date of DUR _____

DUR Title (description)	
Source of best-practice evidence used to support DUR	
Criteria for DUR	
Method of data collection & evaluation	
Results	
Actions or recommendations (Proposed changes to standard of care)	
Staff members involved in making changes to care (include role)	
Outcome of actions	

Additional notes:

References

[1] Clyne B, Fitzgerald C, Quinlan A, Hardy C, Galvin R, Fahey T, et al. Interventions to address potentially inappropriate prescribing in community dwelling older adults: a systematic review of randomized controlled trials. J Am Geriatr Soc. 2016, 64: 1210–1222. doi: 10.1111/jgs.14133

[2] Baker S, Lee YP, Hattingh HL. An evaluation of the role of practice pharmacists in Australia: a mixed methods study. International Journal of Clinical Pharmacy (2019) 41:504–515. https://doi.org/10.1007/s11096-019-00807-5

[3] Pousinho S, Morgado M, Falcão A, Alves G.Pharmacist Interventions in the Management of Type 2 Diabetes Mellitus: A Systematic Review of Randomized Controlled Trials. J Manag Care Spec Pharm. 2016 22:5: 493-515

[4] Gillespie U, Alassaad A, Hammarlund-Udenaes M, et al. Effects of pharmacists' interventions on appropriateness of prescribing and evaluation of the instruments' (MAI, STOPP and STARTs') ability to predict hospitalization--analyses from a randomized controlled trial. *PLoS One*. 2013;8(5):e62401. Published 2013 May 17. doi:10.1371/journal.pone.0062401

[5] Milosavljevic A, Aspden T, Harrison J. Community pharmacist-led interventions and their impact on patients' medication adherence and other health outcomes: a systematic review. Int J Pharm Pract. 2018; 26: 387-397. doi:10.1111/ijpp.12462.

[6] Tan ECK, Stewart K, Elliott RA, George J. Pharmacist services provided in general practice clinics: A systematic review and meta-analysis. Res Social Adm Pharm 2014;10(4):608–22. doi: 10.1016/j.sapharm.2013.08.006.

[7] Freeman C, Cottrell N, Rigby D, Williams I, Nissan L. The Australian practice pharmacist. Journal of Pharmacy Practice and Research (2014) 44, 240–248. doi: 10.1002/jppr.1027

[8] Tan ECK, Stewart K, Elliott RA, George J. Pharmacist services provided in general practice clinics: A systematic review and meta-analysis. Res Social Adm Pharm 2014;10(4):608–22. doi: 10.1016/j.sapharm.2013.08.006.

[9] Brown JB, Lewis L, Ellis K, Stewart M, Freeman TR, Kasperski MJ. Mechanisms for communicating within primary health care teams. Can Fam Physician. 2009;55(12):1216–1222.

[10] Baker S, Lee YP, Hattingh HL. An evaluation of the role of practice pharmacists in Australia: a mixed methods study. International Journal of Clinical Pharmacy (2019) 41:504–515. https://doi.org/10.1007/s11096-019-00807-5

[11] Deeks LS, Naunton M, Tay GH, Peterson GM, Kyle G, Davey R, Dawda P, Goss J, Cooper GM, Porritt J, Kosari S. What can pharmacists do in general practice? A pilot trial. Aust J Gen Pract. 2018 Aug;47(8):545-549. doi: 10.31128/AJGP-03-18-4520.

[12] Benson H, Lucas C, Benrimoj SI, Williams KA. The development of a role description and competency map for pharmacists in an interprofessional care setting. Int J Clin Pharm. 2019 Apr;41(2):391-407. doi: 10.1007/s11096-019-00808-4. Epub 2019 Mar 16. Review.

[13] Tan EC, Stewart K, Elliott RA, George J. Integration of pharmacists into general practice clinics in Australia: the views of general practitioners and pharmacists. Int J Pharm Pract 2014;22(1):28–37.

[14] Baker S, Lee YP, Hattingh HL. An evaluation of the role of practice pharmacists in Australia: a mixed methods study. International Journal of Clinical Pharmacy (2019) 41:504–515. https://doi.org/10.1007/s11096-019-00807-5

[15] Freeman C, Cottrell WN, Kyle G, Williams I, Nissen L. Integrating a pharmacist into the general practice environment: opinions of pharmacist's, general practitioner's, health care consumer's, and practice manager's. BMC Health Serv Res. 2012 Aug 1;12:229. doi: 10.1186/1472-6963-12-229.

[16] Tan EC, Stewart K, Elliott RA, George J. Stakeholder experiences with general practice pharmacist services: a qualitative study. BMJ Open. 2013 Sep 11;3(9):e003214. doi: 10.1136/bmjopen-2013-003214.

[17] Wagner EH, Austin BT, Davis C, Hindmarsh M, Schaefer J, Bonomi Al. Improving chronic illness care: translating evidence into action. Health Aff (Millwood), 2001. 20(6): p. 64-78.

[18] Wagner EH, Glasgow RE, Davis C, Bonomi AE, Provost L, McCulloch D, Carver P, Sixta C. Quality improvement in chronic illness care: a collaborative approach. Jt Comm J Qual Improv, 2001. 27(2): p. 63-80.

[19] Couzos S, Delaney-Thiele D, Page P. Primary Health Networks and Aboriginal and Torres Strait Islander health. Med J Aust. 2016; 204(6):234-7. https://www.mja.com.au/journal/2016/204/6/primary-health-networks-and-aboriginal-and-torres-strait-islander-health

CONFIDENTIAL

[20] Preston R, Smith D, Drovandi A, Morris L, Page P, Couzos S, Swain L. Integrating Pharmacists within Aboriginal Community Controlled Health Services to improve Chronic Disease Management (IPAC) Project: Qualitative Evaluation Report. April 2020.

[21] Couzos S. Op Cit.

[22] Couzos S, Smith D, Biros E. Assessment of medication appropriateness using the Medication Appropriate Index (MAI) in Aboriginal and Torres Strait Islander patients with chronic disease receiving integrated pharmacist support within Aboriginal Community -Controlled Health Services (IPAC project). Final Report to the PSA, Feb 2020.

[23] Couzos S, Smith D, Biros E. Assessment of medicines underutilisation in Aboriginal and Torres Strait Islander patients with chronic disease receiving integrated pharmacist support within Aboriginal Community -Controlled Health Services (IPAC project). Final report to the Pharmaceutical Society of Australia for the IPAC Project, Feb 2020.

[24] Couzos S, Smith D, Biros E. Assessment of Home Medicines Review (HMR) and non-HMR in Aboriginal and Torres Strait Islander patients with chronic disease receiving integrated pharmacist support within Aboriginal Community -Controlled Health Services (IPAC Project). Final report to the Pharmaceutical Society of Australia for the IPAC Project, Feb 2020.

[25] Couzos S, Smith D, Buttner P, Biros E. Assessment of change in medication adherence and self-assessed health status in Aboriginal and Torres Strait Islander patients with chronic disease receiving integrated pharmacist support within Aboriginal community -controlled health services (IPAC study): Report To the Pharmaceutical Society of Australia. Draft Report, May 2020.

[26] Couzos S, Smith D, Stephens M, Preston R, Hendrie D, Loller H, Tremlett M, Nugent A, Vaughan F, Crowther S, Boyle D, Buettner P, Biros E. Integrating pharmacists into Aboriginal community controlled health services (IPAC Project): Protocol for an interventional, non-randomised study to improve chronic disease outcomes. Research into Social and Administrative Pharmacy, 2020. In Press. https://doi.org/10.1016/j.sapharm.2019.12.022

[27] Tremlett M, Loller H. Integrating Pharmacists within Aboriginal Community Controlled Health Services to improve Chronic Disease Management (IPAC) Project: Support for Pharmacists Report. Draft Report, March 2020.

[28] Department of Health. MBS Online (Medicare Benefits Schedule). Australian Government. 2020. http://www.mbsonline.gov.au/internet/mbsonline/publishing.nsf/Content/Home [Accessed April 2020]

[29] Boyle D, Kong F. A systematic mechanism for the ethical collection and interpretation of display format pathology test results from Australian Primary Care records. Electronic Journal of Health Informatics 2011; 6: e18

[30] World Health Organisation. Essential Medicines and Health Products Information Portal. A World Health Organization resource. Available from: https://apps.who.int/medicinedocs/en/d/Js4882e/8.5.html Access date: 3 April 2020.

[31] Pharmaceutical Society of Australia. IPAC Project Pharmacist Recruitment Report 2020 (TBC).

[32] Couzos S. Op Cit. MAI Report.

[33] Couzos S. Op Cit. AoU Report.

[34] Couzos S. Op Cit. Med review report.

[35] Couzos S, Smith D, Buttner P, Biros E. Assessment of change in medication adherence and self-assessed health status in Aboriginal and Torres Strait Islander patients with chronic disease receiving integrated pharmacist support within Aboriginal community -controlled health services (IPAC project). Report to the Pharmaceutical Society of Australia for the IPAC project. Draft Report, May 2020.

[36] Personal communication with PSA Project Coordinator (MT) via email 19/02/20.

[37] Australian Government Services Australia Claiming Online for PBS medicines. Available from: https://www.servicesaustralia.gov.au/organisations/health-professionals/services/medicare/pbs-pharmacists/claiming/claiming-online-pbs-medicines#a5 Access date: 29/04/2020.

[38] Queensland Government Queensland Health. Nurse Navigators. Available from: https://www.health.qld.gov.au/ocnmo/nursing/nurse-navigators Date accessed: 26 March 2020.

[39] Couzos S. Op Cit. MAI report.

[40] Couzos S. Op Cit. AOU report.

[41] Couzos S. Op Cit. Med review report.

CONFIDENTIAL

[42] Couzos S, Smith D, Biros E. Integrated pharmacists in ACCHSs - Analysis of the assessment of biomedical outcomes in Aboriginal and Torres Strait Islander patients with chronic disease (IPAC study). Draft Report to the PSA, April 2020.

[43] Couzos S. Op Cit. MAI report.

[44] Couzos S. Op Cit. AOU report.

[45] Couzos S. Op Cit. Med review report.

[46] Tan EC, Stewart K, Elliott RA, George J. Integration of pharmacists into general practice clinics in Australia: the views of general practitioners and pharmacists. Int J Pharm Pract 2014;22(1):28–37.

[47] Baker S, Lee YP, Hattingh HL. An evaluation of the role of practice pharmacists in Australia: a mixed methods study. International Journal of Clinical Pharmacy (2019) 41:504–515. https://doi.org/10.1007/s11096-019-00807-5

[48] Freeman C, Cottrell WN, Kyle G, Williams I, Nissen L. Integrating a pharmacist into the general practice environment: opinions of pharmacist's, general practitioner's, health care consumer's, and practice manager's. BMC Health Serv Res. 2012 Aug 1;12:229. doi: 10.1186/1472-6963-12-229.

[49] Tan EC, Stewart K, Elliott RA, George J. Stakeholder experiences with general practice pharmacist services: a qualitative study. BMJ Open. 2013 Sep 11;3(9):e003214. doi: 10.1136/bmjopen-2013-003214.

[50] Deeks LS, Kosari S, Boom K, Peterson GM, Maina A, Sharma R, Naunton M. The Role of Pharmacists in General Practice in Asthma Management: A Pilot Study. Pharmacy (Basel). 2018 Oct 15;6(4). pii: E114. doi: 10.3390/pharmacy6040114.

[51] Wagner EH. Op Cit.

[52] Wagner EH. Op Cit.

[53] Australian Government Department of Health. Medical Benefits Schedule (MBS) Online. Medicare Benefits Schedule - Item 735. A: http://www9.health.gov.au/mbs/fullDisplay.cfm?type=item&qt=ItemID&q=735 Access date: 8 April 2020.

[54] Preston R. Op Cit.

[55] Brown JB, Lewis L, Ellis K, Stewart M, Freeman TR, Kasperski MJ. Mechanisms for communicating within primary health care teams. Can Fam Physician. 2009;55(12):1216–1222.

[56] Rubio-Valera M, Chen TF, O'Reilly CL. New roles for pharmacists in community mental health care: a narrative review. Int J Environ Res Public Health. 2014 Oct 21;11(10):10967-90. doi: 10.3390/ijerph111010967.

[57] Preston R. Op Cit.

[58] Preston R. Op Cit.

[59] Preston R. Op Cit.

[60] Grime J, Blenkinsopp A, Raynor DK, Pollock K, Knapp P. The role and value of written information for patients about individual medicines: a systematic review. Health Expect. 2007;10(3):286–298. doi: 10.1111/j.1369-7625.2007.00454.x

[61] Preston R. Op Cit.

[62] Preston R. Op Cit.

[63] Preston R. Op Cit.

[64] Doucette WR. Innovative Collaboration between a Medical Clinic and a Community Pharmacy: A Case Report. *Pharmacy*. 2019; 7(2):62.

[65] Preston R. Op Cit.

[66] Freeman C, Rigby D, Aloizos J, Williams I. The practice pharmacist: A natural fit in the general practice team. Aust Prescr 2016;39(6):211–14.

[67] Doucette WR. Innovative Collaboration between a Medical Clinic and a Community Pharmacy: A Case Report. *Pharmacy*. 2019; 7(2):62.

[68] Kripalani S, LeFevre F, Phillips CO, Williams MV, Basaviah P, Baker DW. Deficits in communication and information transfer between hospital-based and primary care physicians: implications for patient safety and continuity of care. J Am Med Assoc. 2007;297:831–841.

CONFIDENTIAL

69 Ensing HT, Koster ES, Dubero DJ, van Dooren AA, Bouvy ML. Collaboration between hospital and community pharmacists to address drug-related problems: The HomeCoMe-program. Res Social Adm Pharm. 2019 Mar;15(3):267-278. doi: 10.1016/j.sapharm.2018.05.001.

[70] World Health Organization. Medication Safety in Transitions of Care. 2019 (WHO/UHC/SDS/2019.9). Licence: CC BY-NC-SA 3.0 IGO Available at: https://apps.who.int/iris/bitstream/handle/10665/325453/WHO-UHC-SDS-2019.9-eng.pdf?ua=1

[71] Wheeler AJ, Scahill S, Hopdroft D, Stapleton H. Reducing medication errors at transitions of care is everyone's business. Aust Prescr 2018;41:73–7 https://doi.org/10.18773/ austprescr.2018.021

[72] Preston R. Op Cit.

[73] World Health Organisation. Essential Medicines and Health Products Information PortalA World Health Organization resource. Available from: https://apps.who.int/medicinedocs/en/d/Js4882e/8.5.html Access date: 3 April 2020.

[74] Communication with PSA project coordinators.

[75] Communication with PSA project coordinators.

[76] Standard Funding Agreement Schedule between the Australian Government Department of Health and the Pharmaceutical Society of Australia.

[77] Freeman C, Cottrell N, Kyle G, Williams ID, Nissen L. Chronicles of a primary care practice pharmacist. Integr Pharm Res Pract 2012;1:13–18.

[78] Deeks LS, Naunton M, Tay GH, Peterson GM, Kyle G, Davey R, Dawda P, Goss J, Cooper GM, Porritt J, Kosari S. What can pharmacists do in general practice? A pilot trial. Aust J Gen Pract. 2018 Aug;47(8):545-549. doi: 10.31128/AJGP-03-18-4520.

[79] Personal communication with PSA project coordinators (MT 13/05/2020).

[80] Preston R. Op Cit.

[81] Couzos S. Op Cit. MAI report.

[82] Couzos S. Op Cit. AOU report.

[83] Couzos S. Op Cit. Med review report.

[84] Couzos S. Op Cit. Medication Adherence report.

[85] Couzos S, Smith D, Biros E. Integrated pharmacists in ACCHSs- Analysis of the assessment of clinical endpoints in Aboriginal and Torres Strait Islander patients with chronic disease (IPAC study). Draft Report to the PSA, April 2020.

[86] Couzos S. Op Cit. AoU report.

[87] Couzos S. Op Cit. MAI report.

[88] Couzos S. Op Cit. Med review report.

[89] Baker S, Lee YP, Hattingh HL. An evaluation of the role of practice pharmacists in Australia: a mixed methods study. International Journal of Clinical Pharmacy (2019) 41:504–515. https://doi.org/10.1007/s11096-019-00807-5

[90] Deeks LS, Naunton M, Tay GH, Peterson GM, Kyle G, Davey R, Dawda P, Goss J, Cooper GM, Porritt J, Kosari S. What can pharmacists do in general practice? A pilot trial. Aust J Gen Pract. 2018 Aug;47(8):545-549. doi: 10.31128/AJGP-03-18-4520.

[91] Benson H, Lucas C, Benrimoj SI, Williams KA. The development of a role description and competency map for pharmacists in an interprofessional care setting. Int J Clin Pharm. 2019 Apr;41(2):391-407. doi: 10.1007/s11096-019-00808-4. Epub 2019 Mar 16. Review.

[92] Preston R. Op Cit.

[93] Preston R. Op Cit.

[94] Preston R. Op Cit.

[95] Preston R. Op Cit.

[96] Couzos S. Op Cit. MAI report.

[97] Couzos S. Op Cit. AOU report.

CONFIDENTIAL

[98] Couzos S. Op Cit. Med review report.

[99] Couzos S, Op Cit. Medication adherence report.

[100] Couzos S, Op Cit. Clinical endpoints report.

CONFIDENTIAL