Piloting a novel multidisciplinary telepharmacy medication review service in a rural community

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Introduction

In Australia, the percentages of hospital admissions due to adverse drug events range from 5.6% in the general population and 30.4% in the elderly population.[1] It has been established that inappropriate medication management and medication related problems (MRPs) are a leading preventable cause of hospital admissions[2,3] and is also the most likely major contributing factor to 30 day post-discharge readmission in high risk patients; research by the author identified that 25–27% of 30-day readmissions in rural and regional hospitals are due to medication.[4]

In 2001 the commonwealth pharmacist home medication review (HMR) was established to reduce medication misadventure issues in the community.[5] The HMR is initiated by General Practitioner (GP) referral but there are fundamental gaps and challenges with the current system resulting in low uptake of the service; combine this with no referral pathway for hospital initiated HMRS means many patients with chronic and complex disease in the community, at risk of medication misadventure, are not being reached by pharmacists. Many rural and remote communities have no access to an accredited HMR pharmacist either because of remoteness or the small population does not warrant a community pharmacy.

The Community Liaison Pharmacist (CLP) is a recognised model of care (MOC) defined by the Society of Hospital Pharmacists of Australia (SHPA) as providing assistance with medication management and pharmaceutical care in order to promote quality drug use in the community as well as facilitating links between the hospital, community health team, general practitioners and community pharmacists.[6] A community liaison pharmacy service provides comprehensive medication reviews and patient counselling, aimed at increasing self-management of disease, improving concordance with medication and educating on therapeutic lifestyle changes to patients identified as high risk of medication misadventure. The pharmacist works with the patient to provide associated health care practitioners with recommendations to optimise medication regime i.e. adjust dosage, suggest laboratory tests, add medication, discontinue medication and change product formulation. Implementation of the CLP MOC by hospitals has been shown to improve patient outcomes, reduce readmissions and significantly improves functional health status score.[7] A recent adaptation of this model of care is the Monash Health Hospital Outreach Medication Service (HOMR) which is a pharmacist-led service that targets patients at high risk of medication misadventure in the immediate post-discharge period.[8] The telepharmacy service described in this study is based on both the CLP and the HOMR model of care.

Telepharmacy was officially defined in 1997 by the National Association of Boards of Pharmacy (NABP) as “the provision of pharmaceutical care through the use of telecommunications and information technologies to patients at a distance.[9,10] In 2014 a successful hospital telepharmacy service was launched by the author consisting of clinical pharmacists, conducting medication reviews, for outpatients in rural and remote communities; this work was presented at the 13th National Rural Health Conference.[11] The telepharmacy service is delivered by clinical pharmacists based in a medium sized rural hospital to ten rural and remote communities and covers an

area of 160,000klms^2. During the delivery of this service it became apparent to a rural community nurse that some patients at risk of medication misadventure were unable to attend the clinic as an outpatient and would therefore benefit from the service being delivered into their home. The nurse proposed that an iPaD with external WiFi was utilised by the nurse on home visits through which the pharmacist could conduct a medication review with the patient in their home; thus an idea for creating a new telepharmacy model of care was instigated. A novel model of care was devised and a pilot study undertaken to assess if the proposed multidisciplinary telepharmacy medication review service was feasible and to evaluate pharmacist intervention activity. This work was funded by the Queensland Government Rural and Remote Revitalisation (R&RR) programme.

Methods

Exemption from ethical review as part of the rural and remote revitalisation programme evaluation was applied for and granted by the Far North Queensland Human Research Ethics Committee.

The methodology for this novel telepharmacy service is similar to the methodology used for the outpatient telepharmacy service described previously for the 13th NRHC.[11] The main difference is that this service is delivered by the pharmacist in the medium sized rural hospital into the patient's home via an iPad carried by the community nurse.

The setting for this study was a small rural town with two general practitioner surgeries and one community pharmacist; there is currently no accredited pharmacist providing HMRs in the community.

Videoconferencing equipment

Health Services Information Agency (HSIA) is the branch of Queensland Health that procures all videoconferencing equipment and provides 24 hour technical support. The clinical pharmacist used 'Cisco Jabber Video for Telepresence Software' which is licenced software that enables the use of a personal webcam from a desktop computer. A total Cisco system which includes the computer and webcam such as Cisco DX70 would cost $5000 with an extra $250 for the license and the cost of any organisational technical support. In Queensland Health an annual fee for technical support for a computer is set at $1500. The cost of an iPad would start at $1600 plus $250 for the license agreement. The Cisco jabber can work off any computer so if a computer with a webcam is already in place it is just $250 for the licence.

Clinical pharmacist medication review

A telepharmacy clinic was set up in the Hospital Based Corporate Information System (HBCIS) for consult booking and activity data collection. A pharmacy assistant was trained to use this software and was responsible for data collection. The rural community nurse identified patients suitable for the service whilst on home visits. The nurse telephoned the pharmacist to discuss the patient and their particular circumstances and to arrange the consult.

Referral criteria

The following referral criteria adapted from the Australian Pharmaceutical Formulary and Handbook[12,13] was used by the nurse as a guide to identifying patients for the service.

Patients were eligible if they were unable to attend clinic for outpatient medication review due to health reasons and they met at least one of the following criteria:

- patient taking more than four regular medications
- patient at risk of medication misadventure
- patient has a complicated medication regimen and/or chronic diseases
- recent hospital admission
- medications prescribed by multiple GPs and/or dispensed by multiple pharmacies, if known
- patients on medications requiring additional education—inhalers, eye drops, patches, blood glucose monitors.

Medication review

The clinical pharmacist conducts a review of all medications and this is guided by the Society of Hospital Pharmacists of Australia (SHPA) Standards of Practice for Clinical Pharmacy Services.[14]

The review of medications includes as per the SHPA standard[14]:

- medication reconciliation
- assessment of current medication management
- clinical review/therapeutic drug monitoring and adverse drug reaction management
- formulation of recommendations and a 'Medication Action Plan' (MAP)
- provision of medicines information
- facilitation of continuity of medication management on transition between care settings.

Queensland Health outpatient progress notes were used to document all medication activities and pharmacist recommendations. An electronic medication list was compiled for the patient using the enterprise-wide Liaison Medication System (eLMS).[15] The eLMS software is Queensland Health wide and contains any medication information inputted by pharmacists in other facilities i.e. on patient discharge. The clinical pharmacist also has access to 'The Viewer' which is 'a read-only web-based application that displays consolidated clinical information sourced from a number of existing Queensland Health enterprise clinical and administrative systems.[16] Medication information may also be obtained with the patients consent from the patient's community pharmacy and/or general practitioner.

Post consult

After the consult a copy of the electronic medication list and any medicines information was supplied to the patient via the community nurse. The electronic medication list and any pharmacist recommendations were then communicated to the general practitioner via the community nurse. Any urgent recommendations the pharmacist conveyed to the general practitioner by telephone. The community nurse followed up with the GP on all pharmacist recommendations made. Copies of all documentation were sent to the clinic nurse for information and for filing in the patients chart.

Data collection

Data collection includes:

- Telehealth activity from HBISC to measure patient uptake
- Patient survey to measure service satisfaction (Appendix 1)

- Pharmacist interventions/recommendations.

Results

Telehealth activity

Total number of consults from 1 December 2015 to 31 March 2017 is 33 as detailed below:

Month/Year	Number of telehealth consults
December 2015	1
January 2016	3
February 2016	3
March 2016	1
April 2016	1
May 2016	2
June 2016	1
July 2016	1
August 2016	3
September 2016	1
October 2016	1
November 2016	5
December 2016	1
January 2017	3
February 2017	3
March 2017	3

Pharmacist intervention/recommendations

Month/Year	Number of telehealth consults	Number of medications being taken:	Number of Interventions/ recommendations
December 2015	1	18	9 (7 medications ceased)
January 2016	3	56	16
February 2016	3	27	13
March 2016	1	10	5
April 2016	1	13	6
May 2016	2	16	3
June 2016	1	12	4
July 2016	1	1	0
August 2016	3	22	5
September 2016	1	21	1
October 2016	1	16	6
November 2016	5	51	21
December 2016	1	9	5
January 2017	3	24	12
February 2017	3	32	9
March 2017	3	31	4

From the thirty-three (33) telepharmacy consults a total of three hundred and sixty-one (361) medications were being taken by patients which averages as 11 medications per patient. A total of one hundred and nineteen (119) recommendations were made to patient's general practitioners averaging at 3.6 recommendations per patient.

Types and numbers of intervention/recommendation	
Medication Dose Alteration	19
Medication Cessation	25
Medication addition or change to more suitable therapeutic option	17
Patient specific monitoring	8
Miscellaneousrecommendations	47

Patient survey

33 patients completed patient surveys which is a 100% response rate.

- All thirty-three patients strongly agreed with the statement: To be able to get local pharmacy services are important to me
- All thirty-three patients strongly agreed or agreed with the statement: My needs are adequately met by videoconferencing
- All thirty-three patients strongly agreed with the statement: I thought the waiting time for an appointment was reasonable
- All thirty-three patients strongly agreed with the statement: The staff member introduced him/herself
- All thirty-three patients strongly agreed or agreed with the statement: My privacy was respected at all times.
- All thirty-three patients strongly agreed with the statement: The medication advice was adequate and practical for my home situation.
- All thirty-three patients strongly agreed with the statement: The information was easy to understand.
- All thirty-three patients strongly agreed or agreed with the statement: I was encouraged to participate and take responsibility in the planning of my care.
- All thirty-three patients strongly agreed with the statement: My personal needs and lifestyle were considered.
- All thirty-three patients strongly agreed with the statement: I am satisfied with the service I received.

Comments received included:

> 'First time I've done a videoconference. The screen was clear and I liked the experience I'd do it again!'
>
> 'First time—I liked it.'
>
> 'This process is new to us—enjoyed skyping—amazing service' 'I am extremely grateful for the pharmacist's advice and time.' 'Awesome Service'

A patient example

This is an example of a 42 year old palliative patient who was discharged from hospital with a complex medication regimen. The community nurse visited the patient in their home the day after

their discharge to administer daily syringe driver cares. The community nurse recognised that the patient's wife, who was responsible for medication administration, was struggling to understand the medication regimen and needed immediate pharmacist support. A telepharmacy consult was arranged for the same day with the pharmacist who had previously provided pharmacy support whilst the patient was in hospital and who had developed a rapport with the patient and the patient's wife. The hospital pharmacist had spent some time counselling the patient and the patient's wife pre-discharge but due to complexity of situation and complexity of medications the patient's wife had not retained all the required information.

Background

Patient diagnosed with Klatskin cholangiocarcinoma in May 2016 and now with liver and peritoneal metastasis. Biliary stent insitu and insertion of PleureX peritoneal drain in October 2016. Patient under the care of palliative care consultant based at tertiary hospital 70 kilometres away. Anti-epileptics started in October 2016—Magnetic Resonance Imaging (MRI) of brain normal. Patient had a very recent hospital admission with bacterial peritonitis. Patient was admitted to hospital this episode for symptom management due to increased pain and associated nausea and vomiting. Patient was discharged on a syringe driver and with four new medications. Community nurse was visiting Monday to Friday to change syringe driver with patient's wife administering all other medications.

Discharge medications

Hydromorphone (Dilaudid-HP) 50mg/5mL Injection	Inject 2 once each day via syringe driver (current driver dose = 120mg daily)	Treat severe pain
Hydromorphone (Dilaudid-HP) 10mg/mL Injection	Inject 2 once each day via Syringe driver (daily driver dose = 120mg)	Treat severe pain
Levetiracetam (APO-Levetiracetam) 500mg Tablets	Take half a tablet TWICE a day	Treat epilepsy
Macrogol 3350 (Herron ClearLax) 17g Sachets	Take 1 sachet in the MORNING	Treat constipation
Pantoprazole (Somac) 40mg Tablets	Take 1 tablet in the MORNING	Treat reflux disease
Sodium Bicarbonate (Orion) 1%, 500mL Mouth wash	Use 10mL of mouthwash FOUR times a day	Mouth care
Miconazole (Resolve Tinea) 2%, 25g Cream	Apply cream THREE times a day	Antifungal cream
Trimethoprim – Sulphamethoxazole (Bactrim DS) 160mg-800mg Tablets	Take 1 tablet TWICE a day	Antibiotic; Prevent bacterial infection
HYPROMELLOSE with DEXTRAN (Poly-Tears) Eye drops 3 mg-1 mg per mL (0.3%-0.1%), 15 mL	Instil 1 drop FOUR times a day	Dry eyes
Dexamethasone (Dexmethsone) 4mg Tablets	Take 1 tablet in the MORNING	New Prevent nausea
CLONAZEPAM (Rivotril) 1mgin 2 mL (set containing solution 1 mg in 1 mL and 1 mL diluent) Injection	Inject 1mL at NIGHT when required (dose = 0.5mg in 1mL)	New
Olanzapine (Zyprexa zydis) 5mg Wafer	Place 1 wafer on the tongue and allow to dissolve, once each day when required	New Treat nausea
Lorazepam (APO-Lorazepam) 1mg Tablets	Place half a tablet under the tongue four times a day when required.	New Treat anxiety
Hydromorphone (Dilaudid-HP) 10mg/mL Injection	Inject 2 THREE times a day when required	

Discharge medications were also given to the community nurse for midazolam and metoclopramide injections for future use in the syringe driver.

Outcome

Patient was able to spend a further five days at home before being readmitted to hospital for four days and then passing away. It was extremely important for the patient to spend as much time as possible at home with his wife and children and the community nurse felt that without the telepharmacy consult the patient would have been readmitted much sooner.

Conclusion

It can be concluded from this work that patients are very comfortable with telepharmacy itself as well as with the delivery of this service into their homes. The multidisciplinary model of care allows for opportunistic consults, reaching of patients that are housebound, pharmacist ability to visualise all medications in a home environment and enables the community nurse to reinforce and help manage outcomes. For rural patients with no access to an accredited HMR pharmacist this service offers increased access to a clinical pharmacist. The pharmacist interventions demonstrate that this service can decrease medication misadventure in the community and enhances the continuity of care during transition from hospital to home. This service supports the community nurse as well as the patient by providing pharmacist education on medications and by providing advice on medication queries encountered in the field.

Policy recommendation

The 6th Community Pharmacy Agreement (6CPA), an agreement between the Australian Government and the Pharmacy Guild, governs the Home Medicines Review (HMR) programme which aims to enhance the quality use of medicines and reduce adverse medicines events[17]. This is undertaken through a comprehensive medication review conducted by an accredited pharmacist in the patient's home and the HMR is funded by the 6CPA. Patients living in rural and remote communities are unable to access pharmacists in this way as the distances involved are too far for community pharmacists to travel. A hospital based clinical pharmacy telehealth service currently provides an alternative to the HMR for rural and remote patients. It is therefore a policy recommendation that the use of telehealth as a model of care for HMRs is recognised, endorsed and funded resulting in equity for patients living in rural and remote communities.

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Presenter

Like you, Michelle Rothwell is passionate about providing safe and equitable healthcare for rural patients. Michelle is an experienced clinical pharmacist based at Atherton Hospital on the Cairns Hinterland in Far North Queensland. Michelle has the responsibility for medication management for two large rural hospitals and ten rural and remote sites. Michelle implemented the first pharmacy telehealth rural outpatient model of care in Australia which was presented at the 13th National Rural Health Alliance conference. Michelle has a strong interest in research and her latest project is 'implementing and evaluating a telehealth post-discharge and high risk medication management service' funded by the Allied Health Professional Office of Queensland. Current roles include Rural Advisor to the Society of Hospital Pharmacists (SHPA), Chair of the SHPA Rural and Remote Advisory Group and chair of the Rural Director of Pharmacy Services Advisory Committee of Queensland.

Appendix 1:

Patient Survey:

Patients are asked to score each question using the following: 1 2

3 4 5

Disagree Strongly — Neutral — Agree Strongly

- To be able to get local pharmacy services are important to me
- My needs are adequately met by videoconferencing
- I thought the waiting time for an appointment was reasonable
- The staff member introduced him/herself
- My privacy was respected at all times.
- The medication advice was adequate and practical for my home situation.
- The information was easy to understand.
- I was encouraged to participate and take responsibility (in the planing) of my care.
- My personal needs and lifestyle were considered.
- I am satisfied with the service I received.
- For further comments: