

Purposeful collaboration: Enriching lives for people with Parkinson's disease

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Abstract

Background: Individuals with Parkinson's disease (PD) have more hospital admissions, longer hospital stay, more complications and worse outcomes compared with similar patients without PD. Limited understanding about PD among healthcare professionals and medication management are key issues for individuals with PD.

Methods: This study presents a collaborative clinical practice improvement project that was implemented in a hospital in New South Wales, Australia (September 2015 to May 2018) to resolve issues for patients with PD on admission to hospital. Innovative interventions were implemented to address specific issues identified in the study setting, including an emergency department patient tracking icon, early referral to pharmacists and measures to ensure on-time medication administration and avoidance of contraindicated medications. Qualitative and quantitative data were collected through focus group discussions with PD support group members, surveys involving nurses and patients/carers and a chart audit. Data were analysed using descriptive statistics.

Results: These initiatives resulted in practice improvements including identification of 100% of patients with PD presenting/admitted to hospital within 4 hours of presentation/admission, a 19% increase in patients receiving medications on time, an 89% reduction in prescription of contraindicated medications and reduced length of hospital stay. In addition, 80% of patients/carers reported they were very satisfied with their medication management.

Conclusion: Patient safety was improved and clinical staff expressed satisfaction with care provision. The initiatives were also standardised across the hospital in a clinical guideline for the care of patients with PD.

Keywords: Parkinson's disease, time critical medications, collaboration, leadership.

Introduction:

Parkinson's disease (PD) is a progressive neurological disorder caused by the loss of dopamine producing cells in the substantia nigra, which is located in the basal ganglia. As dopamine assists with transmitting and modulating signals in the brain, ongoing dopamine depletion causes motor, autonomic and cognitive impairments (Magrinelli et al., 2016). PD is characterised by motor symptoms that are associated with movement (e.g. bradykinesia, rigidity, postural instability, tremor) (Magrinelli et al., 2016), and non-motor symptoms (e.g. mood/cognitive problems, depression, pain, sleep problems) (Schapira et al., 2017). Motor symptoms are considered the clinical manifestation of dopa-

mine insufficiency and used for PD diagnosis (Chenoweth, Sheriff, McAnally, & Tait, 2013; Queen, 2017; Schapira, Chaudhuri, & Jenner, 2017). However, non-motor symptoms can become more debilitating than motor symptoms as PD progresses (Chenoweth et al., 2013; Schapira et al., 2017).

A recent epidemiological study indicated up to 212,000 people (1 in 117 people aged over 50 years) are living with PD in Australia, with more than one million caregivers, family and friends directly impacted by the condition (Ayton et al., 2019).

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The associated economic burden in 2014 was almost \$1.1 billion and accounted for 53% of all health system costs (Deloitte Access Economics, 2015); this burden is expected to rise. Nursing home and inpatient hospital care comprise the largest component of these costs (Bohingamu Mudiyanselage et al., 2017; Deloitte Access Economics, 2015; Oguh & Videnovic, 2012).

The insidious onset, no known cure, and progressive nature of PD mean it is challenging to treat and requires a multidisciplinary approach (Bramble, Carroll, & Rossiter, 2018). In the inpatient context, a lack of specialist knowledge and low adherence to PD medication regimens can result in poor clinical outcomes such as extended recovery time, worsening symptoms, falls and morbidity (Cohen & Smetzer, 2015; Donizak & McCabe, 2017; Grissinger, 2018). These adverse events can result in longer hospital stay, re-presentations and re-admissions, and increased health system costs (Donizak & McCabe, 2017; Harris & Fry, 2017). Other concerns include shortfalls in the care provided and the lack of knowledge about PD in the healthcare team (Gill & Kitson, 2016).

A recent Australian study by Harris and Fry (2017) suggested education and orientation programs should be more specific to PD and identified a need for evidence-based clinical guidelines to support earlier detection and management of PD in the inpatient setting. Greater collaboration among the healthcare team (including pharmacists) was also needed to improve medication administration practices and avoid potential adverse events (Harris & Fry, 2017). It is important to identify a person with PD at presentation/admission to hospital so staff can be alerted to that person's particular needs (e.g. time-critical medications). An early warning system means strategies can be implemented to ensure medications are available without delay (Aminoff et al., 2011; Gerlach, Winogrodzka, & Weber, 2011; Harris & Fry, 2017). This paper presents a collaborative clinical practice improvement project that was implemented to raise awareness about PD among healthcare professionals, facilitate inter-professional collaboration to address medication issues and improve the care journey for patients with PD.

Project Background

This collaborative project aimed to streamline hospital admission for individuals with PD by resolving identified problems. It also aimed to address increasing frustration and concerns among hospital staff and the local PD support

group regarding care provision for patients with PD. Staff at the study hospital were also concerned about poor understanding of the complexity of PD (e.g. prolonged medication delays can be life threatening), extended length of hospital stay for patients with PD and reported adverse medication-related events. These concerns were consistent with issues reported in the literature (Donizak & McCabe, 2017; Oguh & Videnovic, 2012).

In New South Wales (NSW), Australia, a part-time Parkinson's Clinical Nurse Consultant (CNC) services four hospitals (a 292-bed regional base hospital and three peripheral hospitals) along with nursing homes, community visits and a multidisciplinary clinic, without specific neurology support. This project was motivated by the Parkinson's CNC in response to concerns raised by clinicians and consumers.

Project Aim

In the study hospital it was considered important to identify individuals with PD on presentation to the emergency department and improve staff knowledge and medication administration practices (Aminoff et al., 2011; Gerlach et al., 2011; Harris & Fry, 2017). Specifically, this project aimed to ensure that: individuals with PD presenting to the study hospital were identified within 4 hours of presentation/admission; essential medication was available in the emergency department; patients received medications on time; and contraindicated medications were not administered. The study outcomes included patient/carer satisfaction with medication management, reduced adverse events/incidents, and identification of individuals with PD on presentation to hospital.

Methods:

Following engagement with hospital and community stakeholders, a clinical practice improvement team was formed to address identified problems relating to effective PD care provision. The reporting of this study was consistent with the SQUIRE guidelines (Ogrinc et al., 2016).

Project Setting and Implementation Team

This project was conducted from September 2015 to May 2018 at a regional teaching hospital in New South Wales, Australia. The hospital provides a range of services including emergency medicine, general medicine, surgical, obstetric, paediatric, rehabilitation and intensive care services. Specialist services include an acute stroke unit, a coronary angi-

ography unit, a renal unit, a mental health unit and oncology and radiotherapy services. The project was conducted in collaboration with the local Parkinson's Support Group and Parkinson's NSW. The multidisciplinary project implementation team was recruited from across the study hospital (e.g. emergency, medical and surgical wards, and the hospital quality unit) and comprised a range of clinicians including doctors, nurses, a speech pathologist, a dietician, occupational therapists, physiotherapists and pharmacists. The team was co-led by the CNC, an occupational therapist and a pharmacist, and supported by the hospital executive. The project team included two members of the local PD support group to ensure consumer engagement throughout.

Participants

Purposive sampling was used to recruit participants for the project-specific surveys. This sampling method captured individuals who had experienced the phenomenon under investigation (Yin, 2016). An opt-out method was used for hospital staff and patients/carers that did not want to participate. Participants were directly approached and provided with information about the project. Two focus group discussions were held with members of the local PD support group, one before and one after project implementation (25–30 people in each group). Focus group participants were identified and recruited through the support group coordinator. The inclusion criteria for the focus groups were membership of the support group, and a diagnosis of PD or a carer for a person with PD. Those that were not members of the support group were excluded.

The number of nurse participants ranged from 12–29, depending on the intervention measured. The inclusion criterion for nurse participants was nurses working in that ward/unit. Survey completion was voluntary. In addition, patient/carer (n=16) satisfaction with medication management was assessed post-implementation using a short anonymous survey. Patient/carer participants were recruited during admission to hospital using convenience sampling. Patients/carers were eligible to participate if they had a length of stay >1 day. Discharged patients were excluded. Participants were informed that the survey was voluntary, and they could choose whether or not to participate.

Interventions

Specific interventions (discussed below) were introduced to address identified issues. The

project followed the clinical practice improvement methodology described by the NSW Clinical Excellence Commission, which offers a framework that allows clinicians to '*review, identify and understand causes of the failure and design solutions to continuously improve processes of patient care*' (NSW Health, 2019).

The project process involved assessing the local context, Plan-Do-Study-Act cycles, audit and feedback, benchmarking and regular practice education support (Gill & Kitson, 2016). This supported improved delivery of safe clinical care and enabled the team to build understanding of the underlying problems and gain insight into how to implement improvements. Clinical champions across the hospital were also used to educate others, advocate for change and translate new knowledge into routine clinical practice (Gill & Kitson, 2016; Mabey, 2013). (See Figure 1).

Grand Rounds

To raise awareness of PD among hospital staff, education materials were developed through PD 'Grand Rounds'. In this setting, Grand Rounds are weekly hospital-wide multidisciplinary education sessions. For this project, the Grand Rounds were filmed so all staff could access the education material. In the Grand Rounds, the multidisciplinary project team provided education regarding the key points and interventions required for a person with PD when in hospital. The Grand Rounds also included a patient story to demonstrate improvements in care from one admission to the next.

Alert System: PD Icon and Automated Referral to a Pharmacist

A system was developed to alert emergency department staff to the arrival of patients with PD to support the project target of identifying patients with PD within 4 hours of presentation. Changes were made to the emergency department patient tracking board so a person with PD was identified with a green PD icon. This was coupled with an automated notification system to alert the Parkinson's CNC and initiate referral to the pharmacist.

Medication Management

Four strategies were developed to address identified medication issues. First, PD medications were made available in the emergency department to support administration of time-critical medications and avoid medication delays. This intervention aimed to ensure timely access to these medications, in-

cluding after hours. Second, a pictorial alarm clock was introduced at the bedside to note critical medication times for inpatients. This was considered important as standard hospital medication round times may not match individualised medication plans for people with PD. Third, stickers for time-critical and contraindicated medications were developed for pharmacists to use on patients' medication charts to remind staff and support the necessary practice change. These stickers provided visual cues to highlight the importance of administering medications on time and identify the top three medications that should not be given to patients with PD. Finally, a clinical algorithm was developed to support switching a person's medication when their ability to swallow was compromised.

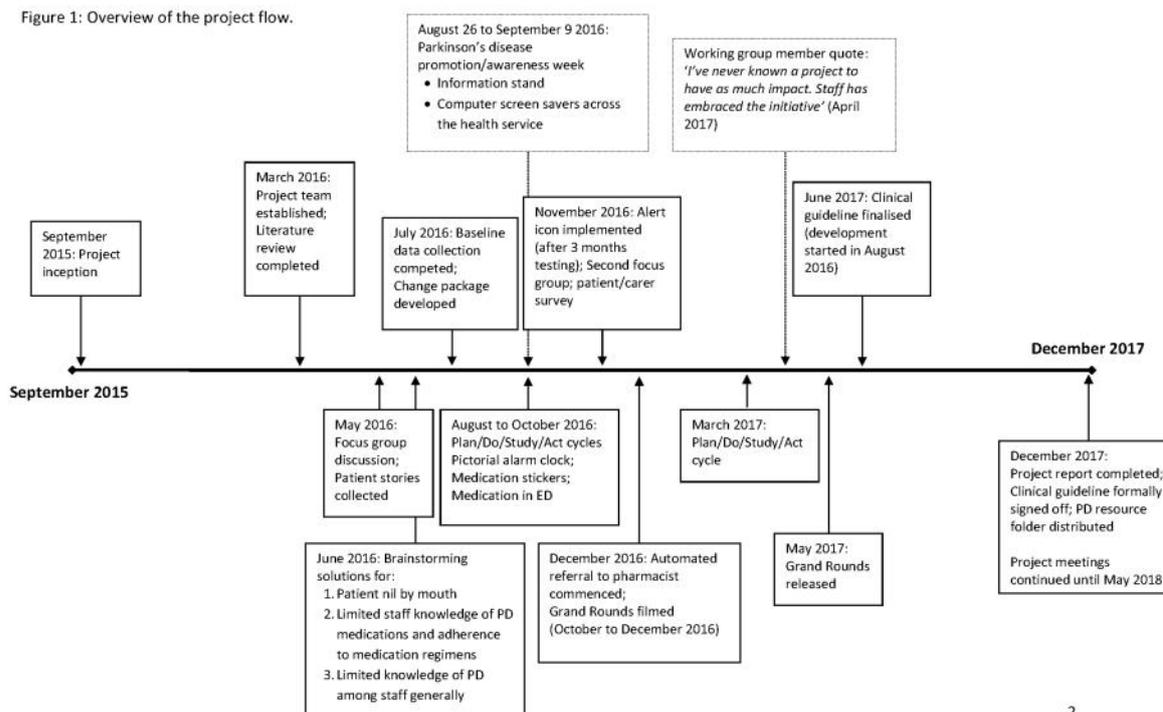
Data Collection

Qualitative data from the focus group discussions were collected in field notes. The focus groups were facilitated by the hospital quality coordinator, who asked open-ended questions around hospital admission of patients with PD (e.g. 'Taking PD medications while in hospital is important, can you tell me of your experiences with these medications in hospital?'). All focus group participants were encouraged to speak freely and openly. One focus group was held before project imple-

mentation and one was held post-implementation. Information obtained from the first focus group assisted in developing the project interventions. The post-implementation focus group provided opportunity for feedback on the interventions. Both focus groups were held in an accessible community venue and lasted around 60 minutes.

Quantitative data from nurses were collected via short self-administered paper-based surveys designed by the project team. The surveys were distributed after implementation of each intervention and collected nurses' perceptions of that intervention. For example, the survey distributed following PD medications being made available in the emergency department included questions such as 'Has access to the medication been beneficial in providing patients their medications on time?' Response options for items in all staff surveys were 'yes', 'no' and 'not applicable'. A free text area was provided so staff could offer any further comments. Before each survey, a member of the project team liaised with the nursing unit manager to advise them of the survey and seek their assistance in communicating with staff. The surveys were left on the ward/unit for nurses to complete on a voluntary basis. Completed surveys were returned via a confidential return box located on the ward/unit.

Figure 1: Overview of the project flow.



Data from patients/carers were collected using a paper-based survey (two items) administered post-implementation. One item assessed if the patient had received their medications on time, with responses on a five-point likert scale from 'never' to 'always'. The second item evaluated patients' satisfaction with their medication management, with responses on a five-point likert scale from 'very satisfied' to 'very dissatisfied'.

The chart audit monitored and evaluated changes in practice following the project implementation. The audit was conducted before the project (January to June, 2016) and post implementation (September to December, 2016). Information collected covered: identification of a patient as having PD on admission; adverse events (e.g. aspiration pneumonia, falls, contraindicated medications given); current medications charted on admission; medications administered on time (yes/no/not documented); and pharmacist review after admission to the emergency department.

In total, 22 charts were reviewed. The chart audit was conducted by the project team co-leaders. Charts were included in the audit if they were for patients with a diagnosis of PD as determined by a neurologist, geriatrician or rehabilitation/medical physician, and identified in the hospital electronic medical record system or by hard copy records. In addition, length of stay data were collected from hospital records for September 2015 (commencement) and 2016 (the year after project commenced).

Data Analysis

Qualitative data obtained from the focus group discussions were analysed using thematic analysis. Quantitative data were analysed using descriptive statistics. Any survey questions with missing data were excluded from the analyses. The chart audit data represented approximately 20% of patient admissions (the hospital admits >100 patients with PD each year), but no power calculation was used to determine the sample size. These data were entered into a Microsoft Excel spreadsheet, and descriptive statistics (frequencies and percentages) were calculated. Any missing data from the chart audit were managed by cross checking the data with paper/electronic medical records.

Ethical Considerations

As this was a quality improvement project, formal ethics approval was not required. However, approval to conduct the project

was obtained from the study hospital executive. For nurse and patient/carer participants, return of a completed questionnaire was considered as provision of consent. All patient data were de-identified and aggregated before analysis.

Results:

The project interventions resulted in a number of improved outcomes. The qualitative data obtained from the focus groups are discussed first, followed by the main results for each of the interventions.

Focus Group Discussions

The main themes that emerged from the pre-implementation focus group included medication management, basic care, the human factor and communication. Concerns were voiced about the inadequacies and shortfalls of the hospital system. These data were used to inform the project interventions.

The post-implementation discussion provided opportunity to gather feedback from group members on the interventions. The main themes that emerged from this discussion were increased awareness among hospital staff of the specific needs of people with PD from the start of the care journey, the importance of medication timing and improvement in the overall care experience. The different comments made by participants in the first and second focus group discussions reflected the interventions. For example, a comment from the first focus group was:

'The staff in emergency don't seem to know very much about Parkinson's and the importance of medication timing; it took hours for the staff to get the medication from pharmacy for my husband, and by the time he had it his symptoms were at their worst—very rigid and tremulous—and he was so anxious'.

The feedback from the second focus group was markedly different:

'The staff in emergency and the wards have a very good understanding of Parkinson's. From the moment we presented to hospital, the staff knew my husband had Parkinson's without even asking, the medications were given on time every time, much different from his other admission'.

Interventions:

Staff Education: Grand Rounds

The Grand Rounds lead by the multidisciplinary project team focused on the key points and interventions required for a person with PD when in hospital. The session was filmed and uploaded to the health service’s electronic health education platform, which was available to all employees. The session was available for viewing by groups and on an individual basis. As at 16 March 2020, the production has been viewed 66 times. Although formal feedback was not collected from staff, anecdotal evidence indicated that education provided, ‘a comprehensive overview of PD, the importance of medications on time and the care of patients when in hospital’. A separate version of this education session was produced for the general public and broadcast twice via radio locally and around Australia, with the goal of raising public awareness about PD.

Alert System: PD Icon

The target was to identify patients with PD within 4 hours of presentation to hospital. PD was first identified as a problem in the electronic medical records, and then tagged to the specific patient. An alert was triggered, a green ‘PD icon’ (Figure 2) displayed on the patient tracking board in the emergency department to identify a patient with PD.

This resulted in marked improvement in identification of patients with PD. Post-implementation, 100% of patients were identified on presentation to hospital (Table 1). This enabled earlier and increased referrals to pharmacists, which in turn helped to prevent medication-related incidents.

Figure 2. Parkinson’s disease tracking icon (red circle).



Medication Management

Four initiatives were implemented to improve clinical practice around the administration of

medications to patients with PD. First, PD medications were made available in the emergency department to avoid medication delays. Post implementation, 100% of staff members were satisfied that this change had assisted in reducing medication delays and risk for medication errors (Table 1).

Table 1. Summary of main pre- and post-implementation differences (chart audit)

Intervention	Baseline	Post-implementation
Identification of patients with PD within 4 hours of admission	90%	100%
Automated referral to pharmacist for patient review on admission	27%	31%
Prescription and administration of contraindicated medications	44%	16%
Contraindicated medications identified on medication charts (post-implementation)	-	94.7%
PD medications administered on time	44.4%	63.2%
Time critical stickers used on medication charts (post-implementation)	-	68.4%

The second medication management intervention was the introduction of a pictorial alarm clock at the bedside to highlight critical medication times for inpatients (Figure 3).

Figure 3: Medication management interventions. A: Pictorial alarm clock. B: Stickers for medication charts.



Post-implementation, all staff (100%) reported the clock had highlighted the importance of on-time medications (Table 2). In addition, 93% of patients/carers reported they were satisfied that medications were received on-time. The chart audit showed an increase in administration of PD medications on time from 44% at baseline to 63% post-implementation (Table 1).

The third medication management initiative involved a newly introduced practice where stickers were placed on patients' medication charts to highlight time-critical and contraindicated medications (Figure 3). The chart audit following this initiative showed the administration of contraindicated medications reduced from 44% at baseline to 16% post-implementation (Table 1). After the introduction of these stickers, there was 68% compli-

ance with the time-critical stickers and 95% compliance with the contraindicated stickers (Table 1). Over the study period, the number of reported medication incidents was reduced from 11 to 5 (Table 3). In addition, 100% of staff agreed the stickers highlighted the importance of on-time medications, and 64% reported the initiative had resulted in changes to their practice (Table 2).

Table 2. Nursing staff responses to the medication management intervention surveys

	Yes n (%)	No n (%)	Not applicable n (%)
Contraindicated sticker (N=24)			
Have you cared for a patient with Parkinson's disease in the last 2 months?	23 (95.8)	1 (0.4)	
Have you seen the contraindicated medication sticker?	16 (66.7)	8 (33.3)	
If yes, did the sticker highlight the importance of NOT administering the listed medications?	16 (66.7)	0	8 (33.3)
If yes, did the sticker result in a change of practice?	9 (37.5)	5 (20.8)	8 (33.3)
Did you know that these commonly prescribed meds were contraindicated for people with PD?	18 (75)	6 (25)	
Did the sticker result in a change of knowledge?	10 (41.6)	8 (33.3)	6 (25)
Time-critical sticker (N=19)			
Have you seen the time critical sticker?	15 (78.9)	4 (21)	
If yes, did the sticker result in a change of knowledge?	5 (26.3)	10 (52.6)	4 (21)
If yes, did the sticker result in a change of practice?	5 (26.3)	10 (52.6)	4 (21)
Are the stickers user friendly?	18 (94.7)		1 (5.3)
Medications available in the ED (N=12)			
Are you aware that medications are available in the ED?	11 (91.7)	1 (8.3)	
If yes, were you able to identify the correct medication for the patient?	9 (75)		3 (25)
If yes, has access to the medication been beneficial in providing the correct medication for the patient?	9 (75)		3 (25)
Should these medications be available in the ED on a permanent basis?	12 (100)		
Has the initiative <i>raised your awareness</i> of Parkinson's disease?	10 (83.3)	2 (16.7)	
Pictorial alarm clock (N=18)^a			
Did the alarm clock highlight the importance of the need to administer the meds on time?	18 (100)		
Did the alarm clock result in a change in practise?	8 (44.4)	7 (38.9)	3 (16.7)
Is the alarm clock picture user friendly?	14 (77.8)		

ED, emergency department; PD Parkinson's disease.

^aAlthough 29 nurses completed this survey, responses are only included for the 18 nurses who had seen the alarm clock because of missing data.

Finally, a clinical algorithm was developed and implemented to support switching a person's medication when their ability to swallow was compromised and they were nil by mouth (Figure 4). This was part of a clinical guideline that covered the changes implemented throughout the project and aimed to standardise PD care in the study setting (Bramble et al., 2018; Gerlach et al., 2011; Harris & Fry, 2017). Formal and informal monitoring of guideline compliance was implemented to ensure these changes were sustainable. Issues with non-compliance, patient and carer complaints and any reported adverse events were discussed and peer reviewed during regular team meetings over the subsequent 12 months.

In addition to the specific interventions noted above, the project contributed to a reduced average length of stay for patients with PD. Hospital records showed that in 2015, there were 101 episodes of care for secondary diagnoses of PD, with a mean length of stay of 8.97 days.

Further Improvements:

In 2016, there were 149 episodes of care for secondary diagnoses of PD, with a mean length of stay of 6.22 days (Table 3).

Patients/carers expressed satisfaction with medication management (Table 4) following the interventions.

Table 3. Medication incidents and length of hospital stay before and during the

	2015	2016	2017
Number of patients with Parkinson's disease admitted	101	149	112
Number of reported medication incidents	11	6	5
Length of hospital stay (days) ^a	9	6	8

project period

Focus group participants also reported satisfaction with the improved care journey. Team facilitators were available to provide specific education to each ward as needed. This education covered the components of the clinical

Figure 4: Clinical algorithm for patients that are nil by mouth.

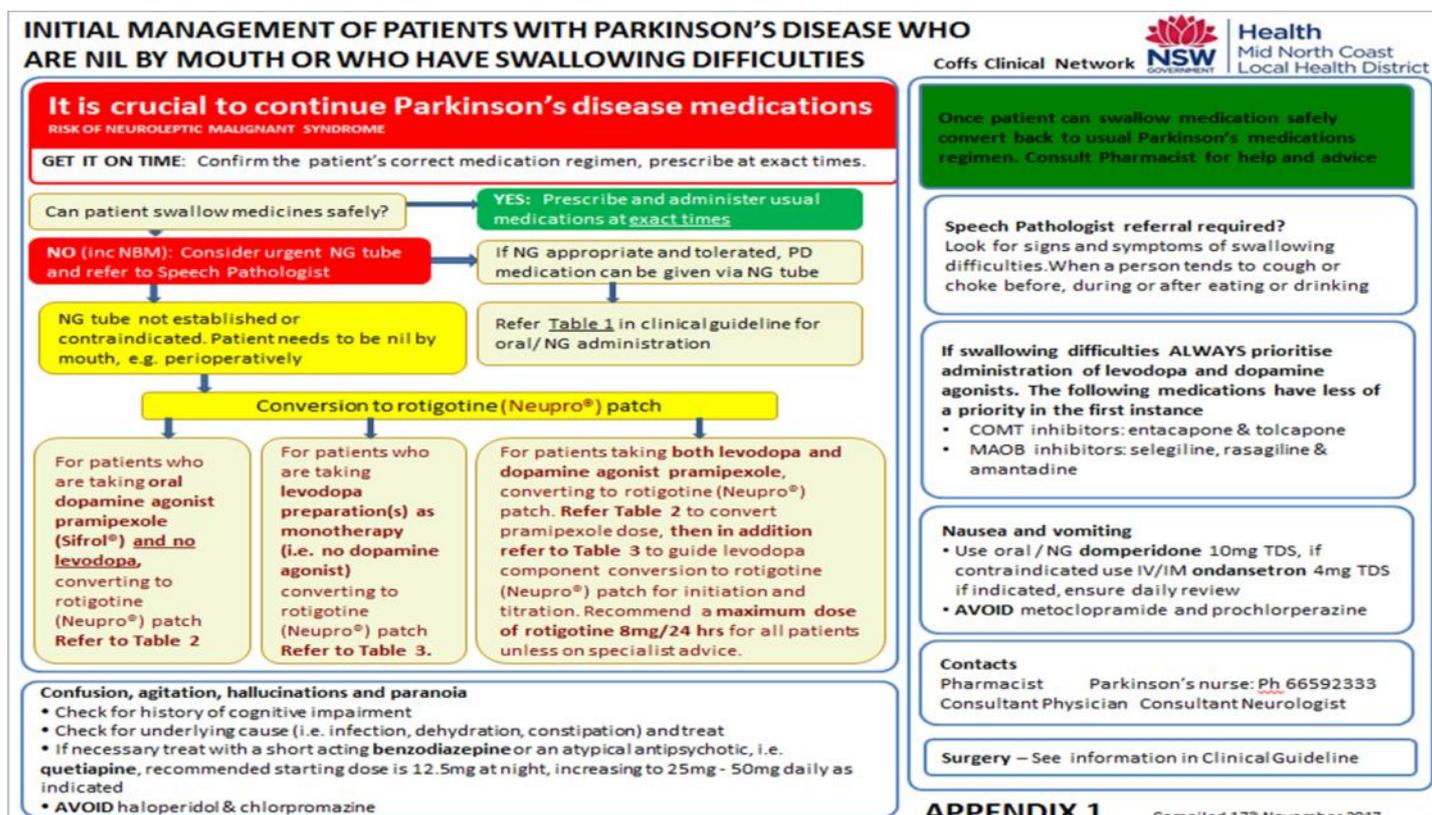


Table 4. Patient/carer satisfaction (N=15)

Item	Responses			
	Always n (%)	Sometimes n (%)	No n (%)	Don't know n (%)
Parkinson's disease medications received on time?	12 (80)	2 (13.3%)	-	1 (6.7)
	Dissatisfied n (%)	Neither satisfied nor dissatisfied n (%)	Somewhat satisfied n (%)	Very satisfied n (%)
Satisfaction with medication management	-	-	3 (20)	12 (80)
Free text comments (examples)	'I don't know much about my medications, just a new diagnosis'			
	'They were pretty good. Wife explained to hospital staff that it was important that the meds be given on time'			
	'Different medication to what he has at home. In hospital he was given a white tablet where he has capsules at home'			

^aThe categories 'Very dissatisfied' and 'Somewhat dissatisfied' have been combined in the table.

guideline, including identification of patients with PD, medication management (e.g. time-critical PD medications, contraindicated medications), and managing patients who were nil by mouth.

Discussion:

This paper presents a collaborative clinical practice improvement project that aimed to improve patient safety through reducing medication-related errors for patients with PD. More broadly, this project raised awareness of PD among healthcare professionals, improved and standardised clinical practice in relation to provision of care for patients with PD and improved patients' journey through care.

The interventions focused on: a patient safety perspective that bridged departmental and professional barriers, continuation of exact personal medication regimens, identifying and avoiding contraindicated medications and alternatives for when a person was nil by mouth. These changes ensured on-time administration of medications, which is thought to reduce symptom aggravation and risk for falls (Donizak & McCabe, 2017; Gerlach et al., 2011; Grissinger, 2018).

Throughout this project, the team had to radically rethink their approach from the presentation and admission of patients with PD by redefining and improving service delivery to meet the needs of patients with PD, their carers and hospital management (Stalter & Mo-

ta, 2018). Both consumers and staff reported they were satisfied with the changes implemented as a result of the project. After the project, patients with PD were identified 100% of the time, and administration of medications on time improved from 44%–63%, the ultimate goal to reach 100% with the proposed introduction of an electronic medication management system. In addition, medication incidents and adverse events were reduced, with the team focused on reducing these events to zero.

The practice changes that occurred in response to this project became core business and were incorporated into a clinical guideline for the care and management of patients with PD at presentation and admission to hospital, with the aim of maintaining meaningful long-term sustained change with improved outcomes (Aminoff et al., 2011; Gerlach et al., 2011; Harris & Fry, 2017). These results are promising and reflect the recommendations and conclusions of other research relating to the care and management of patients admitted to hospital with PD (Aminoff et al., 2011; Chenoweth, Sheriff, McAnally, & Tait, 2013; Chou et al., 2011; Cohen & Smetzer, 2015; Donizak & McCabe, 2017).

The interventions, project process and changes in practice described in this paper have gathered interest in other healthcare settings (both nationally and internationally) following presentations at national (Carroll, 2018a) and international (Carroll, 2018b)

conferences. Key elements have been incorporated into the study hospital's new Electronic Medication Management System (NSW Health, 2018), including electronic prompts for contraindicated and time-critical medications. Initiatives such as the time-critical prompts were subsequently incorporated in the Rural Electronic Medication Management model across six Local Health Districts in NSW.

Other unintended outcomes following the project included the Parkinson's CNC becoming a full-time role at the study institution and a second Parkinson's CNC role being established in the region. Issues regarding provision of care for people with PD identified and addressed in this project highlighted the competencies required for the Parkinson's CNC role (e.g. leadership, facilitation/education skills, person-centred care, collaboration, evidence-based practice and quality improvement). The literature suggests that nurses who display strong leadership and facilitation skills can lead practice change, challenge systems and boundaries and improve performance and standards (Stalter & Mota, 2018).

Strengths and Limitations:

A major strength of this project was the engagement of a collaborative quality improvement team to develop and lead the interventions. The interventions introduced have proved to be simple, cost effective and easy to replicate, and staff and consumers expressed satisfaction with the changes. Limitations of this project included the small sample size used for the chart audit (representing around 25% of admissions) and the staff surveys. In addition, the project would have benefited from statistical support, as no power calculation was used to determine sample sizes.

Conclusion:

This clinical practice improvement project showcases the benefits of a collaborative team approach to solving issues for people with PD presenting and admitted to hospital. The changes in practice described in this paper have been formalised in a clinical guideline to standardise PD care in the study setting.

Broader Implications of the Project:

In April 2018, the project co-leaders made a submission to NSW Health and Education Training Institute regarding implementation of

state-wide PD education. This was successful in June 2019 and resulted in a multimedia education project for nursing and allied health staff (NSW Health, 2020a). The Parkinson's CNC also collaborated with the NSW Health Clinical Excellence Commission in updating the NSW Health Safety Notice for management of medication for patients with Parkinson disease to guide actions by Local Health Districts/Networks (NSW Health, 2020b).

A collaborative research project has also been established to explore the effectiveness of the PD specialist nurse role for people with PD in the wider Australian context. Finally, the project was the catalyst for a three-stage research project commissioned by Parkinson's NSW in collaboration with Charles Sturt University. Stage one involved developing evidence-based models to support best practice nursing services for people with PD in regional NSW (Bramble et al., 2018). Stage two comprised investigating a model of care for people living with PD and comparing the impact of two specialist PD nurses in regional NSW (Rossiter, Bramble, Matheson, Carroll, & Phillips, 2019). A pilot retrospective analysis was also conducted to explore the cost effectiveness of specialist PD nurses, with the Parkinson's CNC as the initiating researcher (Bramble, Wong, Rossiter, Carroll, & Schwebel, 2019). Stage three focuses on the role of community groups supporting people living with PD (Carroll, 2019).

Conflicts of interest:

The authors have no conflicts of interest to declare in relation to this article.

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