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## Pharmacist 'intelligent' referrals to a Psychiatric Liaison Team

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# Final Report

## Summary

Antipsychotic medications are associated with an increased risk of falls, delirium, cerebrovascular events and all can cause death (1-7). It is crucial that patients prescribed these agents receive regular specialist review to optimise therapy and prevent harm (8, 9). This is achieved at City Hospital with the Rapid Assessment Interface and Discharge (RAID) team. Traditionally, patients were seen by RAID following a referral from medical or nursing staff, however when prescribing was analysed it was found that only a third of patients on these agents were referred (8, 10, 11). There was therefore the potential to establish if pharmacy could help improve patient's access to RAID. This was an alternative to the traditional model of pharmacy, with the hope to target clinical services according to patient need rather than by physical ward location. A novel pharmacist referral system was developed using real-time dispensing information to identify hospital in-patients receiving antipsychotics, mood stabilisers or dementia medicines.

A total of 345 patients were reviewed by a pharmacist, 152 (44%) were referred representing an 11% increase from baseline. Nearly half (n=69, 20%) of the referrals were generated by a pharmacist who was also found to have a clinical impact on patient care in an additional 91 (26%) patients. Pharmacy referrals focussed on medication safety, this was different than those generated by medical and nursing staff whose emphasis was on symptoms and behaviour.

The pharmacy referral service was found to enhance the clinical management of the vulnerable mental health patient in the hospital setting. Although, the model was demonstrated in mental health, it is felt that it could have a wider use according to the prescription of any high-risk medication. Access to, and transition of information between care sectors was found to be a significant problem and improvements are recommended.

## Introduction

In the UK in 2015 it is estimated that 850,000 people live with dementia, a disease that carries a massive personal, family, social and economic cost (12). The Alzheimer's Society (2015) reports that the financial cost of dementia in the UK is currently £26 billion per year and that this number will continue to rise as patient numbers increase. It estimates that there will be over a million people with dementia in the UK by 2025 and by 2030 there will be around 65 million people worldwide (13). Furthermore, it is estimated that at any time up to a quarter of patients in general acute hospitals will have dementia (14).

Currently, there is no known cure for dementia and no pharmacotherapeutic agent with proven ability to halt disease progression(13). As such, management is centred on symptom control to improve quality of life. There are a multitude of symptoms that the dementia patient can exhibit. The most difficult ones to treat are generally those associated with aggressive behaviour and changes in personality, which are distressing both to the patient and those around them. These symptoms are collectively known as the 'behavioural and psychological symptoms of dementia' (BPSD), they are multifaceted and varied but generally occur in between 60-80% dementia sufferers at some point in their disease (Figure 1) (15, 16).

Behavioral and Psychological Symptoms of Dementia (BPSD)	
<b>Behavioral Symptoms</b>	<b>Psychological Symptoms</b>
Agitation	Anxiety
Aggression	Apathy
Cursing	Depression
Disinhibition	Delusions
Irritability	Euphoria
Restlessness	Hallucinations
Screaming	
Shadowing	
Wandering	

Figure 1. Behavioural and Psychological Symptoms of Dementia (13, 17, 18).

The 2009 Banerjee report made serious and damning claims about the use of antipsychotics in the dementia patient suggesting that up to 144,000 of the 180,000 antipsychotic prescriptions were inappropriate and that by reducing their prescribing 1,800 deaths and 1,620 cerebrovascular events per year could be prevented (19). These facts were the subject of much media attention and brought dementia management to the forefront of the public domain (Figure 2) (20-23). However, the Banerjee report was not the first time that concerns surrounding the use of antipsychotics were documented. Apprehension regarding their use as chemical restraints in the elderly was first documented nearly thirty years ago, highlighting that this is not a newly identified problem(24). Despite these concerns, prevalence data suggests that the use of these agents is widespread both nationally and internationally(6).



Figure 2. Media headlines following the release of the Banerjee report in 2009.(20-23)

Antipsychotic prescribing in dementia is generally directed towards the management of agitation, aggression, hallucinations and delusions or any other BPSD symptoms causing distress to the patient or their family and friends(6). As Banerjee highlighted research has shown an increase in morbidity and mortality with the use of both typical and atypical antipsychotics as they may worsen symptoms and increase the risk of stroke and early death (25, 26). The adverse effect of antipsychotics has been demonstrated in the elderly patient with dementia, but they are not the only people who are prescribed antipsychotics. Antipsychotics have widespread use in

prescribing for mental health conditions in calming disturbed patients, whatever the underlying pathology(2). Indications include schizophrenia, brain damage, mania, toxic delirium, agitated depression and severe anxiety (1). The same level of caution should be applied in other conditions with assessment of both the benefit and the risk.

### The Pharmacist ‘intelligent’ referral (PIR) system

It has been highlighted that patient’s with dementia and other mental health conditions are at risk of premature death, longer hospital stays and experiencing adverse events if they are prescribed antipsychotic medications (16, 19, 27-29). It is crucial that such patients receive regular specialist review to optimise therapy and prevent harm (16, 30-35). At Birmingham City Hospital the Rapid Assessment and Discharge (RAID) Team provides mental health services to patients who are admitted to the hospital and are in need of review (10). Traditionally the chances of a patient being assessed by the RAID team relied strongly on referrals done by the medical or nursing teams, however it was hoped that the introduction of a pharmacist referral process would improve access to RAID and improve patient outcomes.

A published audit in 2011 analysed the prescribing of antipsychotics at City Hospital for one year using computerised pharmacy dispensing records. (11) This identified that of the 432 patients prescribed an antipsychotic during the time period only a third were seen by RAID during their hospital admission. No statistically significant difference was seen between patients who were seen by RAID and those who were not were not in either age or the number of antipsychotics prescribed. The study concluded that patients who might benefit from early referral to RAID were potentially being overlooked, and that the time to psychiatric referral from admission to hospital was sometimes delayed. It was subsequently proposed that the pharmacy computer system had the potential to aid the identification of patients taking antipsychotic medication, and that this information could be used to improve patient’s access to the beneficial RAID service. (11)

A pharmacist ‘intelligent’ referral (PIR) system was introduced at City Hospital, in June 2012 (figure 3)

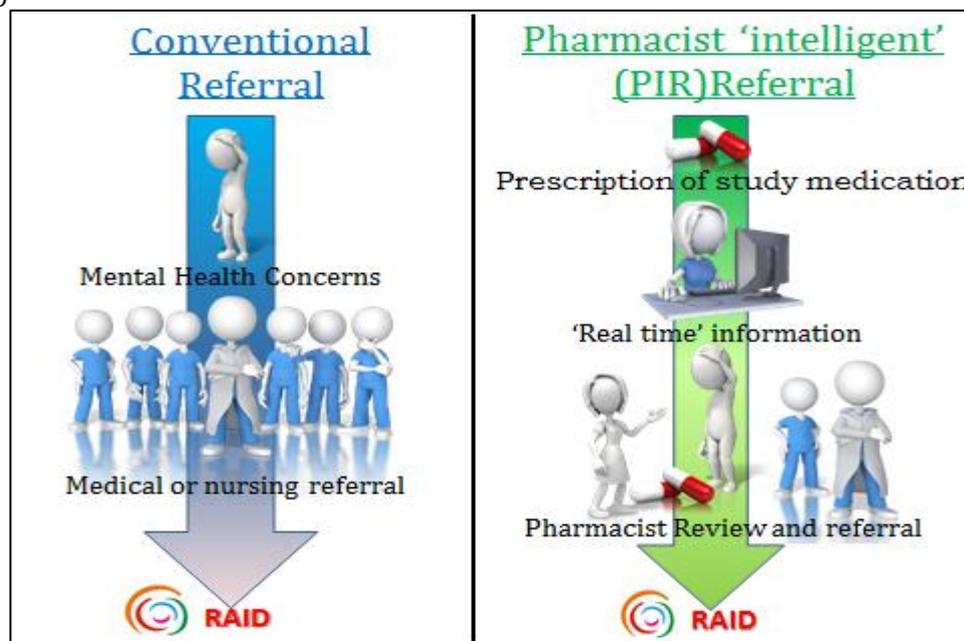


Figure 3. Conventional and Pharmacist ‘intelligent’ (PIR) referral process

The new service used ‘real-time’ dispensing information to identify patients in the hospital receiving psychiatric medication. An email alert (patient name, identifier and location) to the prescription of an antipsychotic was sent to the specialist pharmacist who reviewed the patient,

and assessed the need for referral to RAID given the patient's history and reason for admission. Access to the patients electronic mental health records (RIO ®) could be gained on request via the RAID team, to help inform the referral. The ward based pharmacy team were also asked to alert the specialist pharmacist of any patients who were self-medicating antipsychotics as this would not be highlighted by the pharmacy dispensing system. The need for this would be removed in hospitals which have e-prescribing, but as this was not currently implemented at City Hospital the additional step was required to help to ensure total capture of patients. If a referral was indicated it was generated using the hospitals standard RAID referral documentation as this would allow future evaluation of the quality and appropriateness of referrals generated by the pharmacist in comparison to other health care professionals. The referral was discussed with the medical team and documented in the patients' medical notes. Upon receipt of the referral the RAID team ask for patient consent, conducted a psychiatric assessment and managed care as per the usual process.

It is desired to independently assess the quality and value of the pharmacy entries into the medical notes to provide evidence to support both the new role of the pharmacist as a referral provider as well as the ability of pharmacists to provide effective communication in the medical notes. Pharmacists regularly review the medical notes, reading entries made by other health care professionals to enable them to make informed management decisions on patient care (36). However, they can often be reluctant to make entries themselves, with one study reporting that 74% of pharmacists in a large teaching hospital admitted to not writing in the medical notes for a variety of differing reasons (37). One of the thoughts behind the fear of writing in the notes was found to be a fear of criticism for doctors or worries around litigation.

## Aims

- To investigate whether a pharmacist can use real-time dispensing information to identify, review and refer patients to a psychiatric liaison team.
- To establish if a new pharmacy referral system could facilitate a reduction in the time from admission to referral to the psychiatric liaison team in addition to increasing the number of patients accessing the service.
- To explore the process of referrals to a psychiatric liaison team in an acute NHS Hospital Trust.

## Objectives

- 1) To determine if dispensing event data be used in real time to identify hospital in-patients receiving treatment for a mental illness and if this data could be used by a pharmacist to locate and subsequently review patients receiving treatment for a mental illness.
- 2) To establish if pharmacists can refer patients to a liaison psychiatric team for inpatient review. What the pharmacotherapeutic outcomes of these referrals are and if a pharmacist referral pathway reduces the rate of referrals from other health care professionals.
- 3) To evaluate what constitutes an appropriate referral. What information is required and which health care professionals are able to provide this information.
- 4) To provide evidence to support the value of pharmacists entries in the medical notes.

## Results

### Phase I: A Specialist Pharmacist as a referral provider

Patients were identified using the pharmacy dispensing information (JAC®, Pharmacy medicines management) which sent an email alert to the specialist pharmacist every time a study medication (antipsychotics, mood stabilisers and drugs for dementia as identified in BNF chapter 4.2) was dispensed from Sandwell and West Birmingham NHS Trust. To capture patients' who were self-medicating the ward pharmacy team could directly advise the specialist pharmacist of the patient's admission in person or via phone, email or bleep. This information was used by the specialist pharmacist to conduct a clinical pharmacy review on the patient at ward level. Patients were excluded when the prescription of an antipsychotic was for an indication other than mental health e.g.: levomepromazine in nausea, prochlorperazine for vertigo.

The specialist pharmacist decided if a psychiatric review was required and referred to RAID as deemed appropriate according to their professional pharmacy judgement. Reasons for referral were expected to be:

1. The indication for the antipsychotic was unknown as documented in the medical notes and could not be clarified from the patient or GP surgery
2. The hospital admission could potentially be due to an adverse effect of the antipsychotic e.g.: confusion/falls
3. The patient was displaying symptoms associated with an adverse effect e.g.: Parkinson's type symptom
4. A dementia patient was prescribed an antipsychotic
5. There was inadequate information on suitable follow-up or recent antipsychotic review
6. Specialist mental health input was requested by the parent medical team
7. Patients who the Specialist pharmacists professional pharmacy judgement felt required an antipsychotic medication review

If a referral to RAID was indicated based on the above criteria, consent was obtained from the parent medical team, an entry made in the medical notes and a referral generated. This was completed using the standard liaison psychiatry referral form. The original was filed into the patient's medical notes and a copy taken to give or fax to the RAID team to drive the review. A final copy was filed in pharmacy for data analysis. Additional patient data was collected to enable review of the decisions made, this included:

- Name, strength, route of administration, start date and dose of study medication
- Indication for prescribing of study medication
- Reason for admission to hospital
- Information sources used to gain patient history
- Mental health team managing the patient
- Reason for referral decision

A unique identification number was given to each patient, this number would enable information to be categorised and stored securely within the hospital pharmacy department. The data was collected in real time on the paper data collection tool as detailed above, and was entered into a custom designed electronic database in Microsoft Excel 2010® (Appendix 4) following patient review. This ensured that the data was captured and entered electronically in a time efficient process for future analysis. Data collection and analysis met the Caldecott principles and was maintained securely as per hospital policy.

Outcome data following RAID review was collected on each of the patients from three data sets

1. Inpatient follow-up and review by the specialist pharmacist
2. Review of the SWBH discharge letter (TTO). This was the letter that was generated by the medical team upon hospital discharge for the patients GP

3. Review of the Birmingham and Solihull Mental Health electronic patient records (Rio®) accessed via RAID.

### **Phase II: Referrals using an alternative pharmacist**

The basic methodology remained unchanged from phase I, but a band 7 pharmacist (with no prior experience in mental health) received the alerts (for 0.2wte), reviewed the patient and referred to RAID following a protocol developed following analysis of the results of phase I (Figure 4). Basic demographic data on each of the patients was recorded on a custom datasheet to allow for review of the protocol and the decisions made, this was an updated version of the datasheet used in phase I. Feedback was obtained from the pharmacist on the referral process and the usefulness of the protocol in decision making. The notes and discharge letters of all of the referred patients were reviewed by the specialist pharmacist to allow for assessment of outcomes of the referral and communication to primary care.

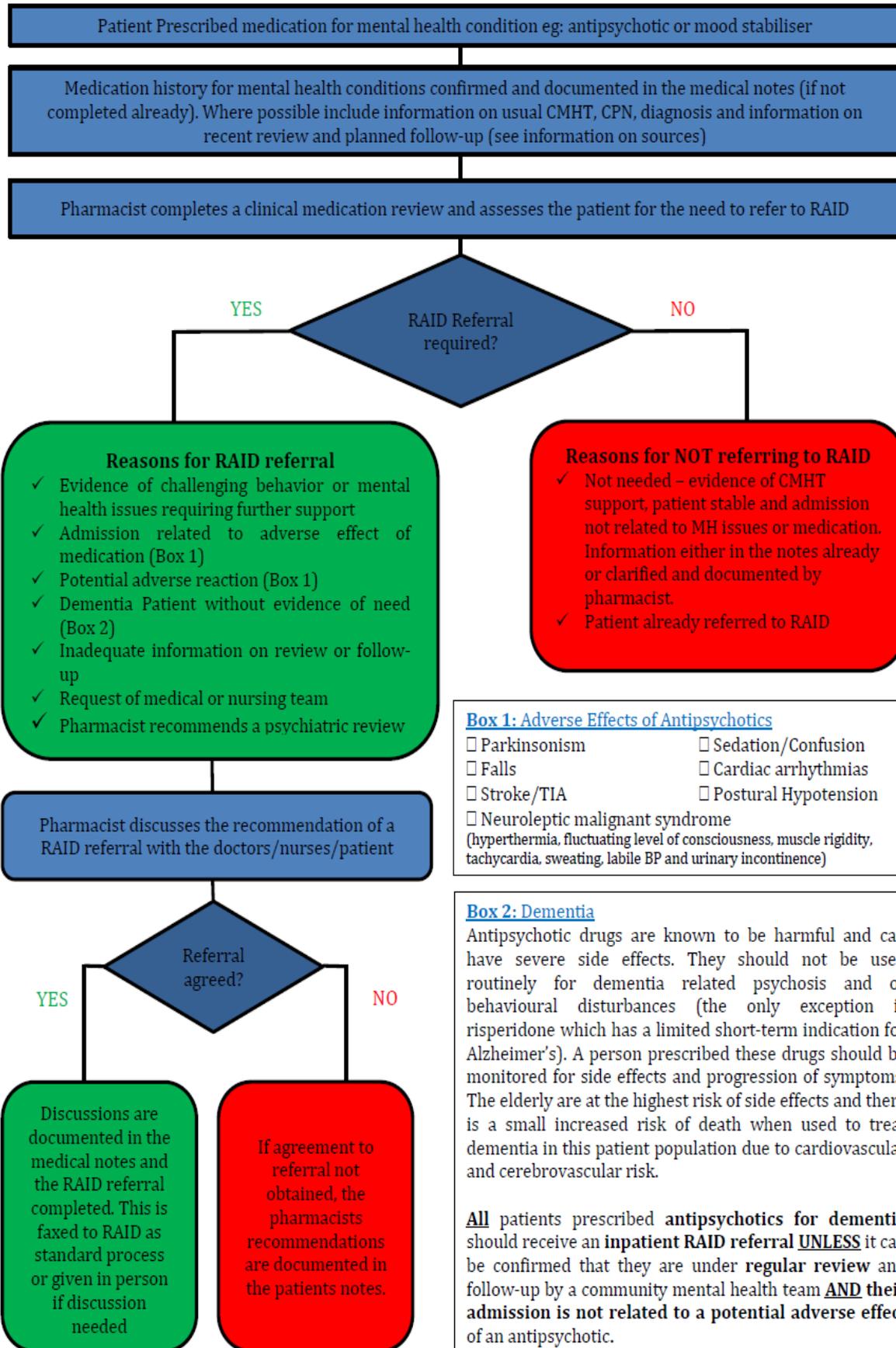
### **Phase III: Clinical Communication**

An independent, retrospective, qualitative analysis of the entries in the medical notes made by pharmacy in patients prescribed medications for mental health conditions was conducted. Patients were identified by pharmacy, who had used real-time prescribing information to review patients within the hospital who were prescribed psychotropic agents as per BNF chapter 4.2, and had had entries made in the patient's medical notes by a member of the pharmacy team.

The pharmacy entries made in the medical notes during the patient's hospital admission were reviewed independently by two doctors (Specialist Registrar level) experienced in both acute medicine and psychiatry (Dr Alexandra Ademolu and Dr Manraj Bhamra). The entries were reviewed for the quality and detail of the clinical information provided by pharmacy and the impact that this would have both medical decisions and patient outcomes. The information source(s) used to evidence the entry was also recorded. Outcome data was obtained from the hospital discharge summary and electronic mental health records (Rio®). The main outcomes focused on the indication for a psychiatric referral, whether a referral was appropriate, whether the patient was reviewed by the hospital's psychiatric team (RAID), and documentation of the outcome of any review, including recommendations for medication changes and follow up plans.

The research project was approved by SWBH NHS Trust Clinical Effectiveness department. Data collection and analysis kept to the Caldecott principles and was maintained securely as per hospital policy.

## Guidance on Pharmacist Review of Medication for Mental Health Conditions and referral to RAID



## Results

### Phase I: A Specialist Pharmacist as a referral provider

During the study period (17/09/2012 to 28/10/2013) 291 patients were reviewed by the specialist pharmacist following an alert to the prescription of a study medication. A total of 122 patients (42%) were referred to the RAID team during their hospital admission of which 41 (35%) were made by the specialist pharmacist. It was found that referrals to other medical teams were also made; these included the patient's usual community mental health team (CMHT) (n=14) and the hospitals Parkinson's Disease consultant (n=2) as was clinically appropriate. All of these referrals were made by the specialist pharmacist. This resulted in a total of 138 (47%) of patients receiving expert care during their admission. Reasons for non-referral were:

1. A referral was not needed (n=78, 27%). The patient was under a mental health team who prescribed the study medication, they were under active review and the admission was not related to either an adverse effect of the medication and no mental health concerns were noted by either the patient or the medical team.
2. A referral was not appropriate (n=8, 3%). The patient was prescribed a study medication but was currently physically unwell and receiving end of life care. A mental health review was not considered to be appropriate.
3. The specialist pharmacist discussed the patient with the RAID (n=61, 21%) team or their CMHT (n=6, 2%). This was done to clarify their mental health history and current treatment plan. This information was documented in the patients' medical notes by the specialist pharmacist who felt that this clarified any outstanding issues and that a formal referral was not required.

Just over half (n= 75, 54%) of the patients who received expert care had already been referred to RAID by the medical or nursing team prior to the specialist pharmacist's review. More than a third (28, 37%) of these patients were treatment naïve; a prescribing alert was generated when one of the study medications was newly started by the RAID team following a referral for advice on behaviour management. As the study progressed referrals became a 2-way process with the RAID team referring patients (6, 4%) to the specialist pharmacist for advice on medicines management.

The reasons for the medical or nursing team referrals is summarised in chart 1. The largest number of cases were to seek advice on behaviour and symptom management (n=46, 62%). The second most common reason for referral (n= 11, 15%) was that the patient had been admitted with an overdose; a situation that generated an automatic referral to the RAID team. A total of seven patients (9%) were referred for advice on management due to a possible adverse effect of antipsychotics. These included three patients with new onset cardiovascular disease, three patients with confusion and one patient taking clozapine who suffered reduced neutrophil count. A total of six patients (8%) were referred by the medical team in order to obtain additional information on the patient's diagnosis, medication or baseline behaviour so as to aid their diagnosis of an acute condition. The "other reasons" category shown in chart 1 included referral because of safeguarding concerns, capacity assessments and follow-up of patients transferred from a mental health bed into the acute general hospital.

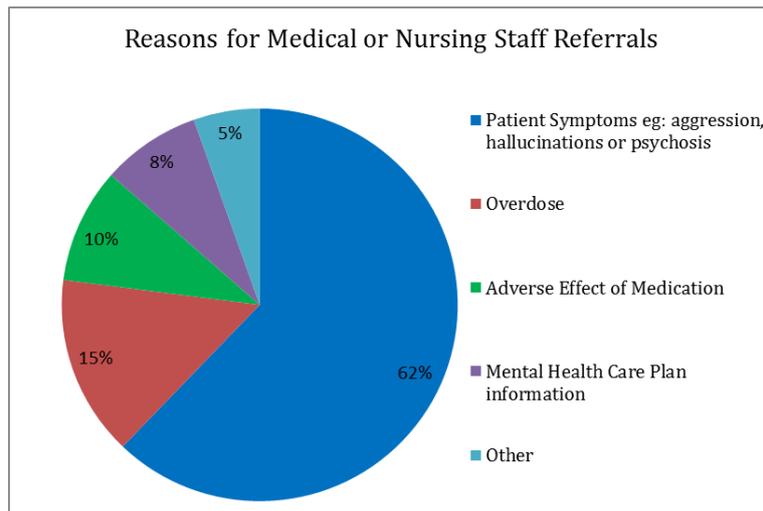


Chart 1. Reasons for Medical or Nursing Staff Referrals to the liaison psychiatry team.

In comparison to the medical and nursing team, most of the specialist pharmacist referrals (n=57) centred on medication appropriateness and safety; as nearly half (24, 42%) were due to the patients admission potentially being related to an adverse effect of their medication. The second most common reason for a specialist pharmacist referral was that based on symptoms (15, 26%) following review of the patients medical notes and a discussion with the nursing staff. Inadequate follow-up was a cause for concern in nine patients (16%), with 4 of these being dementia patients who had not been reviewed in the last 12 weeks as is recommended by NICE. Other reasons (n=9, 16%) for referral included patients who were not under a CMHT (n=3), where the specialist pharmacist felt there was an inadequate treatment plan detailed (n=5) or other concerns over capacity (n=1).

A variety of adverse medication effects (chart 2) led the specialist pharmacist to referral the patient to RAID. The most common ones were falls in the elderly (n=8) and cardiovascular effects (n=7). Examples of the cardiovascular effects noted ranged from ventricular tachycardia and QT prolongation in a patient taking quetiapine to worsening heart failure in a patient recently started on risperidone as a trial for challenging behaviour. Confusion (n=4) and extrapyramidal side effects (n=2) were also identified as well as those classified as 'other' which included deranged blood results (n=2), a stroke (n=1) and potential neuroleptic malignant syndrome (n=1).

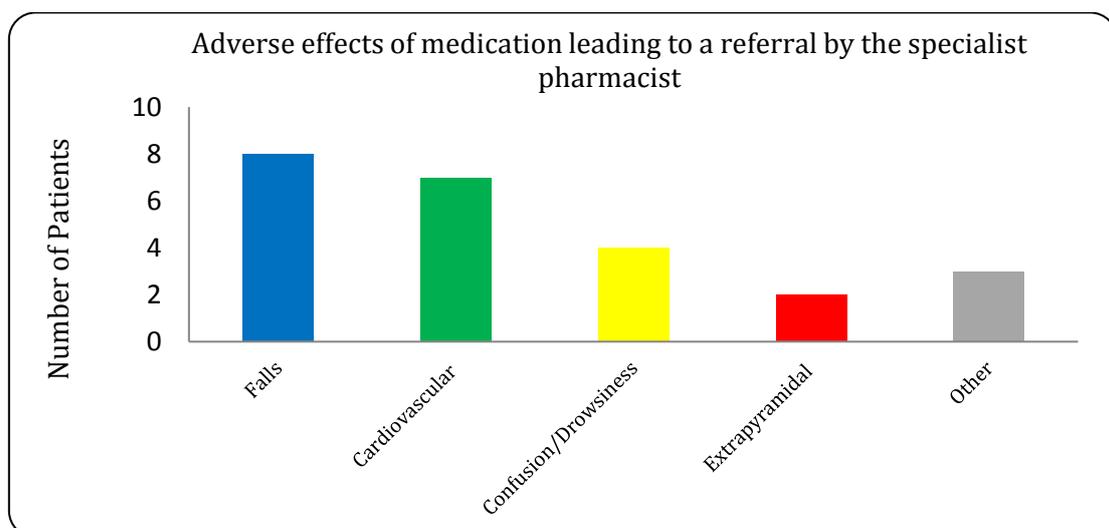


Chart 2. Adverse effects of Target medication leading to pharmacist referral.

A diagnosis of dementia was the most common indication (n=34) for referral followed by schizophrenia (n= 21). But a diverse range of mental health indications lead to the specialist pharmacist making a referral (Chart 3).

Diagnosis	Referral Outcome	
	Patient referred to RAID team	Patient referred to usual CMHT
<b>Dementia (all types)</b>	25	9
<b>Bipolar affective disorder</b>	11	0
<b>Personality Disorder</b>	4	2
<b>Psychosis</b>	5	0
<b>Schizophrenia</b>	19	2

Chart 3. Diagnosis of referred patients in phase I.

Atypical antipsychotics were implicated in most of the referrals, this was as expected as they were also the most frequently prescribed (Chart 4). In contrast to this the typical antipsychotics were much less frequently prescribed, however resulted in a quarter of the referrals. Drugs specifically for dementia lead to the smallest number of referrals.

Study Medication Class	% Referrals	% Total Prescribed
<b>Atypical Antipsychotics</b>	65	66
<b>Typical Antipsychotics</b>	25	14
<b>Drugs for Dementia</b>	1	8
<b>Mood stabilisers</b>	8	11

Chart 4. Classes of medication leading to a referral

The specialist pharmacist had no prior experience in completing referral documentation as this was a potential new role for the hospital clinical pharmacist. Completion of the form was found to be possible by the specialist pharmacist who was confident that it could be completed to a satisfactory level to allow RAID acceptance, and with sufficient detail to enable them to prioritise their workload. The appropriateness of the referrals was validated by the medical team who agreed with the specialist pharmacist's decision in 100% of referrals. 100% of the referrals were accepted by RAID who subsequently reviewed the patient as per their normal processes.

### Patient Outcomes

In total 57 patients were referred by the specialist pharmacist, of which 41 were to the RAID team in 39 patients. This resulted in a total of 122 ward based reviews by the RAID team, 26 (67%) patients were reviewed personally by the psychiatric consultant with the remaining being reviewed by another team member following discussion of the case in the daily multidisciplinary meeting. 27 patients had a full psychiatric assessment completed and documented as part of the review process. Fifteen patients were referred due to suffering a potential adverse effect of medication. Following RAID review 47% (n=7) had their antipsychotic stopped and alternative medication and management strategies suggested; and a further 2 patients their dose reduced to facilitate reduction of side effects. Five patients continued with

their antipsychotic following a risk and benefit assessment and the final patient died during their admission, this was an elderly lady with vascular dementia. In total 60% (n=9) of patients who were suffering an adverse effect of their medication had the medication stopped or modified following review. Referrals based on patient symptoms were also generated by the specialist pharmacist, despite not being able to perform clinical examinations. All patients referred due to symptomatic behaviour had a de-escalation and crisis strategy plan generated to assist ward staff with patient management as well as regular psychiatric reviews to monitor progress and provide further support as needed. Six patients had their antipsychotic stopped following implementation of this advice and improvement in behavioural symptoms.

Upon hospital discharge the letters (TTO's) that were sent to the GP were reviewed for the information that was transferred to primary care to aid the ongoing management. It was found that only a third (n=19) of the TTO's stated that the patient had received an inpatient psychiatric review. When a RAID review had occurred (n=41) a separate discharge letter was sent in 63% (n=26). It is important to note however that in 50% (n=13) of these patients the RAID letter may have been a surprise to the GP as there was no information on the TTO that a psychiatric assessment had been sought during the admission. A total of 7 patients (17%) patients did not have either a letter from RAID or information on the TTO surrounding the inpatient mental health review, this would have been particularly important as 4 of these patients had their antipsychotic stopped during their admission:

1. A schizophrenic lady admitted with a non ST segment elevation myocardial infarction (NSTEMI). Olanzapine was stopped by the RAID consultant following pharmacist referral as the patient was physically very unwell but mentally stable. Prior to admission, the patient had not been reviewed in the community for over a year so the consultant advised referral to the CMHT for review following discharge. This information was not communicated to the GP (other than that the Olanzapine was not prescribed on the discharge prescription). The psychiatric consultant did do a referral to the CMHT so the patient was followed up post-discharge.
2. A dementia patient suffering from Parkinson's disease who had been started on quetiapine by her GP because of symptom: shouting and delusions. The patient was admitted to hospital with seizures, drowsiness and atrial fibrillation. Amitriptyline and quetiapine were both stopped by RAID following review. Only the details of discontinuation of amitriptyline therapy was documented in the discharge letter and this had been done by the medical team prior to RAID review.
3. In one patient a full RAID primary care mental health assessment was conducted but this was not communicated by letter to the patient's GP. This was important as the assessment had led to quetiapine switching to olanzapine due to kinesias following inpatient review and RAID liaison with the patient's usual psychiatrist.
4. A patient with previous depression was prescribed dosulepin and quetiapine which were stopped on admission by the acute medical team due to atrial fibrillation and increasing confusion. Psychiatric assessment and discussion with the patient resulted in the decision to permanently discontinue both agents with review by the GP following discharge.

## **Phase II: Referrals using an alternative pharmacist**

During the study period (01/11/2013 01/04/2014) 54 patients were reviewed by the band 7 (b7) pharmacist following an alert to the prescription of a study medication (chart 5). A total of 14 patients (26%) were referred to RAID for review of which nearly all (n=12, 86%) were made by the b7 pharmacist. One patient was treatment naïve; a prescribing alert was generated when one of the study medications was newly started by the RAID team following a referral for advice on behaviour management. Reasons for non-referral were the same as that seen in phase I of this research:

1. A referral was not needed (n=11, 20%). The patient was under a mental health team who prescribed the study medication, they were under active review and the admission was

not related to either an adverse effect of the medication and no mental health concerns were noted by either the patient or the medical team.

2. A referral was not appropriate (n=5, 9%). The patient was prescribed a study medication but was currently physically unwell and receiving end of life care. A mental health review was not considered to be appropriate.
3. The b7 pharmacist discussed the patient with the RAID or their CMHT (n=24, 44%). This was done to clarify their mental health history and current treatment plan as was seen by the specialist pharmacist in phase I of this research. This information was documented in the patients' medical notes by the b7 pharmacist who felt that this clarified any outstanding issues and that a formal referral was not required.

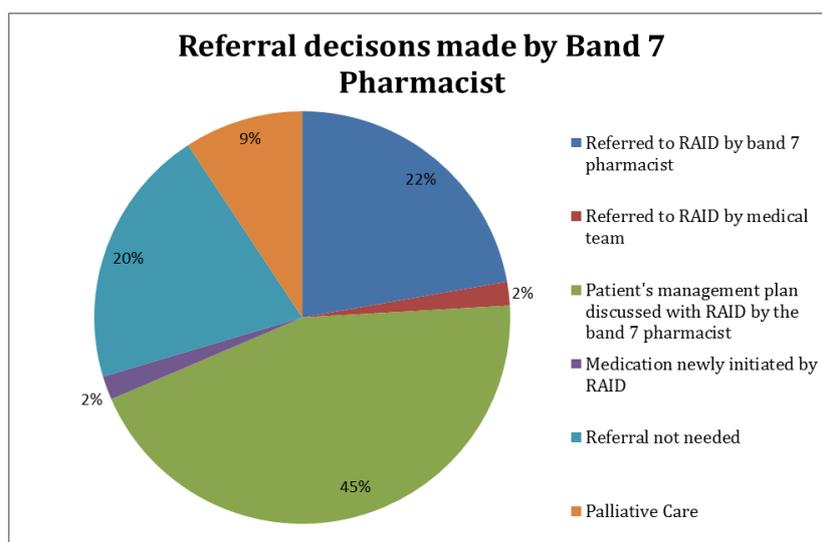


Chart 5. Referral decisions made by Band 7 pharmacist

Nearly half (n=24, 45%) of the patients had their management plan discussed with RAID by the b7 pharmacist as the information from the clerking notes and GP did not provide a clear mental health management plan. This resulted in 71% of patients receiving mental health input during their inpatient admission.

Feedback from RAID continued to be positive with the b7 pharmacist having 100% of the referrals accepted. She was initially apprehensive in completing a referral as this was a new role and she had no experience in either mental health or referrals. A second opinion from the specialist pharmacist was sought for the first few patients. Confidence improved with practice and she quickly became familiar with the documentation and the team, making the decisions easier and the process more efficient. All decisions made were retrospectively reviewed by the specialist pharmacist who agreed with the choices made.

Reasons for the b7 pharmacist making a referral followed the flowchart in the methodology (Chart 6) which was designed following the outcomes of phase I. Adverse drug reactions (n=6, 50%) was the most common reason for referral followed by patients who were not receiving adequate follow-up (n=5, 33%). Two patients (17%) were referred due to new onset of symptoms. This is compared with the reasons for pharmacist referral in phase I in chart 6.

Reason for pharmacist referral	Phase I Specialist Pharmacist (n=57)	Phase II Band 7 Pharmacist (n=12)	Total (n=69)
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<b>ADR</b>	24 (42%)	6 (50%)	30 (43%)
<b>Inadequate follow-up</b>	9 (16%)	4 (33%)	13 (19%)
<b>Patient symptoms</b>	15 (26%)	2 (17%)	17 (25%)
<b>Other</b>	9 (16%)	0	9 (13%)

*Chart 6. Reasons for pharmacist referrals in Phase I and II*

A variety of mental health conditions drove the b7 pharmacists referrals with dementia (n=3, 25%) and schizophrenia (n=3, 25%) being the most common. Other conditions leading to a referral included anxiety disorders (n=2, 17%), bipolar (n=1, 8%) and depression (n=1, 8%). A clear indication for the study medication could not be found in two patients and was the reason for referral.

Thirteen study medications were prescribed in the twelve patients who were referred, as one patient was on both a typical and an atypical antipsychotic. Antipsychotic prescriptions led to the most referrals with nine being generated by patients prescribed atypical, and three from patients prescribed typical antipsychotics. One referral was for a patient prescribed a mood stabiliser (lithium); no referrals were generated from patients prescribed medications for dementia.

### Patient Outcomes

Twelve patients were referred to RAID for review by the specialist pharmacist, of which six were referred by the b7 pharmacist due to concerns over an ADR. Following RAID review the causative antipsychotic was stopped in one patient. This was a schizophrenic male who was prescribed both risperidone and chlorpromazine following an echocardiogram confirming a non-ST elevation myocardial infarction (NSTEMI). Review by the RAID consultant resulted in the chlorpromazine stopping and follow-up in the community to review the need for further treatment based on symptoms. A second patient was a 53 year old lady who was prescribed both mirtazapine and chlorpromazine for anxiety, she had a sodium of 116mmol/l and there were concerns over whether this was medication related. The RAID consultant discussed treatment at length with the patient who was keen to continue on both medications as she reported an improvement in symptoms with the dual combination. Her sodium was monitored and increased to 134 so following a temporary discontinuation were restarted with a plan for recheck and referral in the community depending on the results. A third patient was prescribed a combination of antidepressants (mirtazapine and citalopram) in addition to risperidone for symptoms of anxiety associated with Asperger's syndrome, her medication had been changed multiple times and she was admitted with nausea and vomiting with an associated low potassium and ECG changes. Following lengthy discussion with the family and the RAID team the citalopram was stopped and mirtazapine and risperidone continued with follow-up in the community arranged. The three final patients referred with concerns over an ADR died during their hospital admission:

1. An 81 year old male prescribed quetiapine for vascular dementia. Admitted with confusion and weight loss and found to have deranged liver function tests. He was reviewed by RAID who suggested reducing the quetiapine for 3 days, but the patient died later on in his hospital admission
2. A 53 year old schizophrenic male with multiple co-morbidities prescribed clozapine and Amisulpiride. He was reviewed numerous times by the RAID consultant during his admission to the critical care ward with sepsis and acute kidney injury and was query neuroleptic malignant syndrome.
3. A 75 year old male admitted with a stroke, he was confused and showing inappropriate behaviour (walking around naked and shouting). He was prescribed risperidone for symptoms of dementia (related to alcohol)

The other reasons for b7 referral were concerns due to lack of follow-up (n=4) and symptoms of altered mental state or disturbed behaviour (n=2). Of the four patients referred due to concerns over lack of follow up only one was prescribed their antipsychotic (aripiprazole) for dementia. This was a 97 year old male who had been prescribed aripiprazole since 2013 due to paranoid

delusions, he was not under a mental health team and had not been reviewed since the prescription was started. He was reviewed on the ward by a locum RAID consultant who determined that the aripiprazole was started for mild cognitive impairment associated with paranoid delusions, he advised for it to continue at the moment and to be reviewed in the community, he tried to call the GP to discuss further but was not able to talk to the GP directly so asked the ward Dr to document his review on the discharge letter, this was not done and there was no mention of either the hospital review or the recommendation for community follow-up. Two patients (81 and 84 years) were referred as they had no mental health diagnosis on their admission or GP notes as to why they were prescribed (aripiprazole and Pimozide). Both patients had their antipsychotics stopped following mental health assessment, sadly one died in hospital from urinary sepsis (the reason for admission) but the other had extensive inpatient behaviour management from RAID in discussion with the family (who were supportive of stopping the antipsychotic) and follow-up arranged post discharge. The final patient who was referred due to concerns over follow-up was a 38 year old male admitted with pancreatitis prescribed both sertraline and quetiapine for depression. He had moved areas and was previously under a CMHT in Leicester, RAID review noted he was stable on the combination and no formal follow-up was arranged. No information on the inpatient review or the concerns over his antipsychotics was documented on his discharge letter. He was readmitted a few months later having taken an overdose and has subsequently had extensive CMHT involvement.

Two patients were referred due to symptomatic behaviour. The first was a 65 year old female prescribed lithium for bipolar disorder, visual hallucinations were documented in the medical notes and no lithium levels were requested. RAID reviewed her numerous times during her admission and monitored lithium levels which were found to be subtherapeutic due to non-compliance with medication. Follow-up in the community was arranged on discharge. The other patient was a 74 year old male prescribed risperidone for schizophrenia, he had not been reviewed for 2 years and the ward nurses reported he was agitated and aggressive on the ward. RAID provided behaviour management advice and support whilst he was an inpatient, his aggression usually responded well to risperidone but his concurrent medical condition (epistaxis) was felt to be a factor in his worsening behaviour. The care home had access to mental health support of this was required following discharge.

Communication on discharge continued to be a cause for concern as was highlighted in phase I of this study. In total 8 of the referred patients (4 patients died) were discharged back into the community of which only one had both a RAID letter and details of the RAID review documented on the discharge paper work. Two patients just had a RAID letter and two details of the RAID review on the discharge letter. Three patients had neither a RAID letter nor details of the review on their discharge letter. Problems with communication and information was also raised by the band 7 pharmacist who reported that the core information available to a hospital pharmacist did not often provide the information that was needed to make the required decisions on the referral pathway. The clerking notes were commonly found to be lacking in basic information such as medication history, this could be found by the b7 pharmacist who had access to GP records via SCR, although it did not always include the detail on mental health medication that were prescribed by the mental health trust and as such often found to be incomplete for the needs of this study. Other information was harder to find, this included a definite mental health diagnosis, details on the patients mental health team and recent reviews as well as the essential usual baseline behaviour to enable establishment of if a change in behaviour or symptoms is being seen. This was always documented in the hospital notes or records and as such required further clarification with the RAID team who accessed their patient records via RiO as in phase I. Once this information was gained it was then possible for the b7 pharmacist to determine if a referral was necessary using the guidance provided in the flowchart.

### Phase III: Clinical Communication

During the study period (April 2014-April 2015) 244 patients were identified by pharmacy as being prescribed psychotropic agents, of these, 173 (71%) were reviewed by a pharmacist. Entries in the medical notes by a pharmacist was identified in 41% (n=71) of patients; 43 patients (60%) had entries made by a Senior Pharmacist, 24 (34%) by a band 7 pharmacist and 4 (6%) by other pharmacists. Nineteen of these patients were referred to the hospital Liaison Psychiatry team following a pharmacy review for specialist advice and support.

Pharmacy entries in medical notes were made having referred to at least two clinical sources. Four key reference sources were identified:

1. Rio ®. an electronic patient record system (EPR) used by the local mental health Trust to support Mental Health & Learning Disabilities services
2. Summary Care Records (SCR). An NHS electronic database designed to support patient care as it is a copy of the key information from the GP records.
3. Clinical Data Archive (CDA). Electronic records which hold information on previous hospital admission or clinic appointments in the Trust
4. Pharmacy Computer system (JAC ®). Dispensing event data on prescriptions issued or the current and any previous hospital admissions.

The reviewing doctors found that input provided by pharmacy (having referred to the sources as listed above) provided a supportive role for the medical team to facilitate them in the better management of psychiatric patient in the acute medical setting. Information documented by pharmacy commonly included diagnosis, current medication regimen, named psychiatric team/consultant and details as to their last review/follow up and description of the patients mental health status when this information had not already been determined by the clerking medical doctor. This allowed for the medical team to manage the patient more holistically as a complete mental health history was provided, changes from baseline behaviour could be identified quickly and appropriately managed. This was considered to be of particular importance when a concurrent infection was present as it aided the medical team in distinguishing between delirium associated with infection and usual mental health behaviour. In addition to documenting missing information from the patient's history, pharmacy input helped alert medical staff to potential serious contraindications and serious prescription errors as well as offering potential management strategies. Good examples of these included a case of an 83 year old male with Dementia who had been admitted on a high dose of amisulpride. It transpired that his current dose had not been reviewed in 4 years and his admission was thought to be secondary to a fall as a consequence of excessive drowsiness. The second case was of a young male who had missed 3 days of clozapine as its prescription was not identified in the drug history during his initial clerking. The omission was identified by a pharmacist who documented the details of the prescription and a summary of the patient's mental health in the medical notes. The seriousness of the omission was discussed with the medical team and an urgent psychiatric referral completed by the pharmacist. The pharmacist and the psychiatric team then worked together to quickly titrate the patient's clozapine to his usual dose whilst monitoring behaviour. The clozapine patient monitoring service and the patient's community mental health team were informed of his hospital admission and the missed medication doses.

There were a few occasions where not all the information at the disposal of the pharmacist was relayed in the medical notes. It is not entirely clear as to why this is and is assumed that they were simply transcribing omissions. For example, there was a case where a pharmacist had made a note of a Psychiatrist details (name/work contact number) in the pharmacy notes but this was not documented in the medical notes.

All 19 referrals to RAID made by the pharmacists were deemed appropriate by the reviewing doctors. All were in line with the reasons previously identified as part of the pharmacist referral

pathway. In total, 17 of the 19 patients referred were seen by RAID and the reason for referral actioned; one patient was managed by the patient's hospital medical team with advice from the pharmacist without the need for RAID involvement, and one patient was not seen by RAID due to an early discharge.

Review of the discharge summaries revealed that only 10 (59%) of the 17 reviewed by RAID mentioned liaison psychiatry involvement, including details of the review. Documentation of the psychiatric input on the discharge letter was found to be good in a number of cases. One referral was made in a patient with paranoid schizophrenia prescribed olanzapine who had been intermittently aggressive on the ward and excessively sleepy. He was not currently known to a community mental health team and was last seen by a specialist in 2012. RAID review highlighted that a plan to stop olanzapine back in 2012 was not subsequently carried out. This medication was reviewed and stopped on the basis that there was no evidence of psychosis and the patient had been excessively drowsy. The patient was re-referred to the community mental health team for follow up. This review was detailed in the patient's discharge documentation, communicating essential information for the transition of care including the indication for RAID referral, details of the review, medication changes made and the plan for follow up. Another referral was made for a patient on flupenthixol and mirtazapine admitted to hospital with a myocardial infarction, with no documented psychiatric condition. Both of these medications are cautioned in cardiovascular disease, and the patient was not currently known to a community mental health team. RAID recommended stopping flupenthixol given the cardiovascular risk and the absence of any current or recent psychiatric symptoms, and advised the patient's GP to review whether mirtazapine needed to be continued. Again, details of RAID input including medication changes and advice for follow up were communicated effectively in discharge documentation.

Seven (41%) discharge summaries failed to mention any involvement from RAID. This was particularly significant in the case of one patient referred to RAID for a medication review following pharmacy review. This patient was admitted to hospital with a myocardial infarction and was taking trazadone and risperidone prior to admission. The indication for these medications was unclear, with particular concern given their caution in cardiovascular disease, and the patient was not known to a community mental health team. RAID review identified a previous history of depression but no current evidence of depression or psychosis. The medical team were advised to stop both trazadone and risperidone, and if low mood persisted post cardiac intervention, to consider sertraline given the lower likelihood of cardiotoxicity. RAID input and the recommended medication changes and future advice were not documented in the discharge summary, potentially adversely affecting patient care. Other examples of discharge summaries which did not mention psychiatric involvement included a patient on multiple antipsychotics not under a community mental health team who was referred to a community team, and a case of a patient who missed an urgent community mental health appointment. Whilst failure to document these reviews would be unlikely to directly contribute to any adverse events, it enforces a gap in communication between secondary care and the patient's GP and mental health team.

## **Discussion**

The newly implemented PIR process resulted in increased patient access to the RAID team with both the specialist and the b7 pharmacist able to refer patients for review. The initial drive was a computer generated alert to the prescription of one of the study medicines, but pharmaceutical knowledge was required to review the patient and make decisions on whether further psychiatry input was required. When reviewing the patients on the ward both of the pharmacists found that it was often difficult to make an informed referral decision due to limited information surrounding the patient's mental health condition being documented in the patients' medical notes. Reasons for this included the patients' inability to provide the detail as well as the information not being readily available from the GP surgery or electronic GP records that hospital

pharmacists have access too. To complete the referral documentation effectively it was necessary to establish the indication for the medication and the details of their specialist mental health team (if they had one). Additional clinical information on their usual baseline behaviour was desirable to help to determine if a change has occurred, as this was likely to be a reason for referral. In relation to dementia, information on recent review was required to establish when the antipsychotic was prescribed and if the risk and the benefit had been reviewed as per the NICE guidelines. To establish the missing information the pharmacists often needed to seek information from the liaison psychiatry team who could access the electronic mental health records (RiO) for patients under the care of the local teams (Birmingham and Solihull Mental Health Trust, BSMHT). In addition to providing the pharmacists with information that would aid the referral decision it also provided valuable clinical information that was subsequently documented in the patients' medical notes to aid continuity of care during the inpatient admission. This data gathering resulted in a significant number of patients not requiring a formal referral to be made to the RAID team as the pharmacists were able to document a mental health care plan in the medical notes for implementation during the hospital admission (chart 7)

Study	Number of patients	Total number of referred patients	Patients referred by a pharmacist	Patients discussed with RAID by a pharmacist	Total patients receiving inpatient mental health input
<b>I</b>	291	138 (47%)	57 (20%)	67 (23%)	205 (70%)
<b>II</b>	54	14 (26%)	12 (22%)	24 (45%)	38 (70%)
<b>Total</b>	345	152 (44%)	69 (20%)	91 (26%)	243 (70%)

*Chart 7. Total mental health input in both studies.*

The data in chart 7 highlights how a total of 70% of patients received inpatient mental health support during their inpatient admission across both studies. Nearly half of the patients prescribed one of the study medicines in phase I were referred to RAID representing a 14% absolute increase from baseline (11). This was not continued in phase II when the total number of referrals was reduced. What was not anticipated in this research was the number of patients who were discussed with RAID but did not generate a referral, this can be used to explain the difference in the number of referrals between phase I and II. These were patients who had their management plan informally discussed with RAID and documented in the notes by the pharmacists. This was not expected when the study was designed as it was thought that the decision would be to refer or not. However, due to the pharmacists regular interaction with the RAID team, and their attendance in the weekly multidisciplinary meeting it was often possible to address any issues and document a plan in the medical notes following a more informal discussion.

The results from phase I confirmed the most likely reasons for referral, and facilitated the development of a flow chart to be followed by the b7 pharmacist in phase II. These were:

1. Evidence of challenging behaviour or mental health symptoms requiring support and specialist input.
2. Patients admission potentially related to an adverse effect of one of the study medications
3. The prescription of an antipsychotic to a patient with dementia who did not have a clear indication for need.
4. Inadequate information on review by a community mental health team or recent follow-up
5. A mental health review was required as requested by the medical or nursing team or by the pharmacist according to professional judgement.

The b7 pharmacist was able to follow the flow-chart, making referrals according to the newly developed pathway. As a less experienced pharmacist she did not make any referrals that fell outside of the remit of the protocol.

The initial drive for this research centred on dementia patients and medication review as directed by the Banerjee report (19). However, all patients prescribed antipsychotics are at risk and as such all were included in the study (1, 4, 33, 35, 38, 39). It was discovered very early on in phase I that this was the correct decision as was evidenced by a diverse range of clinical conditions that led the specialist pharmacist to generate a referral. This was continued in phase II by the b7 pharmacist who also referred patients with a variety of mental health conditions (dementia, schizophrenia, anxiety, bipolar and depression).

Referrals made by the pharmacists were different than those generated by medical and nursing staff whose focus was on symptoms and behaviour. Pharmacy referrals focussed on medication safety, highlighting patients who were suffering from adverse effects of medication, had an inadequate medication plan or had dementia and had not had their medication reviewed by a specialist in the previous 12 weeks as per national recommendations. Potential adverse drug reactions were found to be the reason for a total of 43% of all of the referrals made by the pharmacists, and were more commonly seen in the antipsychotics in comparison to the other study medicines. It is well recognised that the side effect profile of the typical antipsychotics is less favourable than the newer agents, but that all antipsychotics have an extensive list of possible side effects that are to be monitored for (1, 40-44).

Atypical group of antipsychotics were implicated in most of the referrals. This was not unexpected as they were also the most frequently prescribed antipsychotics. It should, however, be noted that although the typical antipsychotics were much less frequently prescribed, they still accounted for a quarter of the referrals. This may be explained by the recommendations regarding choice as they should not be prescribed as a first line agents and are the more likely to be associated with the adverse effects that was found to be a driving factor for referrals (1, 26, 29, 35). Of the adverse effects noted, falls were the most common. Although medication is not the only reason for the patient falling, a referral was generated if there was not an obvious organic precipitating factor or there was a clear relationship between onset of medication and falls history. The complexity of this type of referral highlights that although there are specific factors that can drive a referral it is also essential that the complete history is reviewed and a clinical decision made. Cardiovascular effects were the second most common adverse effect accounting for pharmacist referrals and ranged from ventricular tachycardia and QT prolongation in a patient taking quetiapine to worsening heart failure in a patient recently started on risperidone as a trial for challenging behaviour. These two examples highlight the complex nature of referrals and how a comprehensive clinical thought process was required to establish cause and effect. It should also be noted at this point that although the ADR was the primary reason for the referral there was also other causes of concern in many of these patients.

Drugs for dementia specifically did not lead to many referrals which was surprising and was contrary to one of the initial ideas behind this research. As according to NICE recommendations, the prescription of a drug specifically for dementia can only be initiated by a psychiatrist it was found that patients admitted to hospital who had been prescribed one of these agents were already under close and active follow-up by a CMHT and did not often require referral (34, 45, 46). A large focus of this research was to look at the use of antipsychotics in dementia and see the impact on the referral system on reviewing and potentially stopping these agents in dementia patients if the use was found to be inappropriate. In this study 109 patients with dementia were identified, with 76% (n=83) being prescribed an antipsychotic. Of the antipsychotics prescribed 38% (n=32) were for risperidone, which is currently the only one with UK licensing for this indication, highlighting the large off-license prescribing of these medications in this patient population. A total of 15% of patients were prescribed the first generation antipsychotics which are associated with a greater side effect profile, with haloperidol, trifluoperazine and flupentixol all being used. Of the 83 patients seen by the pharmacist 93% (n=77) were being prescribed antipsychotics in the community prior to their hospital admission. In total 77% (n=64) had input

from a specialist team during their admission, most of which was generated by the pharmacist and all but 2 were for patients prescribed antipsychotics. Reasons for specialist input included concerns over adverse drug reactions (ADRs), inadequate information on recent review and follow-up and patient behaviour. ADRs were the most common reason for referrals and were seen in 16 patients. Cardiovascular and cerebrovascular effects as well as confusion and falls being the ones identified in our patient population. These concerns align with those seen in the literature and were the main reason for the initial call for the review of the prescribing of these medications in the dementia patient by Professor Banerjee [2]. The decision to prescribe an antipsychotic in the elderly with dementia is not one to be taken lightly and as such it is important that a risk vs benefit assessment is undertaken when patients prescribed these medications are admitted to hospital. This explains the high number of referrals made in this research following identification of an antipsychotic prescription in combination with a hospital admission highlighting the need for a specialist review. There is a need to balance a complex decision between managing disease and avoiding medicines related problems. Stopping medicines is sometimes necessary to maintain this balance and is an important part of medicines optimisation. The challenge with antipsychotics in dementia is around the review, particularly if this is not being undertaken by a specialist as many of the side effects listed could lead to a hospital admission. Some ADRs are easy to identify as they have specific parameters that can be measured, an example of this would be a patient admitted with palpitations, syncope or seizures following recent initiation of quetiapine with an ECG identifying Q-T prolongation. Others may not be so obvious and can be masked or complicated by many other patient factors. For example a fall may be attributable to syncope resulting from an antipsychotic but may also result from the medication causing hypotension, drowsiness and confusion. A coincidental infection leading to delirium can further complicate this already difficult situation. The potential adverse effects of antipsychotics in dementia is not the only reason there is limited recommendations for their use, concerns regarding patient benefit was also highlighted by Professor Banerjee. Current recommendations suggest that first line management of the behavioural and psychotic symptoms of dementia should involve de-escalation strategies and person centred care [27]. The hope was that the pharmacy referral system could improve patient access to the specialist psychiatry team and that this would facilitate the review of antipsychotic medications prescribed to patients with dementia in line with the recommendations. It has already been highlighted that patients with dementia prescribed antipsychotics were frequently referred to the psychiatric team for review, and that the referral was often generated by the pharmacist. In many situations the referral was made due to concerns over adverse drug reactions, but referrals based on lack of review and follow-up as well as to aid behavioural management were also made.

The specialist pharmacist felt competent in her ability to adequately complete the referral documentation, this was supported by RAID who accepted 100% of the referrals. A total of 122 ward based reviews by the RAID team occurred following these referrals highlighting how the PIR process facilitated patient access to specialist mental health care during their inpatient admission. This data also provides support for the quality and appropriateness of the referrals as demonstrated by the need for numerous assessments and visits by the mental health team. The b7 pharmacist was more apprehensive initially as making decisions and completing the referral was a new role, so support was sought from the specialist pharmacist for the first few patients. Confidence improved with time but this highlights how if pharmacist referrals are to become more widespread practice additional training will be required initially.

Patient outcomes were positive and patient harm was reduced. Following RAID review, 69% of patients who were referred following a concern surrounding an adverse effect of medication and had their treatment discontinued and alternative strategies started, or the dose reduced following a benefit vs harm assessment. De-escalation and crisis strategies to facilitate ward staff with patient management was always provided by RAID and following employment of this advice 6 patients referred with behavioural issues had their antipsychotic discontinued. Review of

specialist medication following pharmacy concern over harm has been suggested in the literature with antipsychotics featuring as part of the STOPP criteria for medication appropriateness (47, 48). However, when the criteria are applied there is often a reluctance to stop specialist medication expressed by the medical and surgical teams due to concerns in their ability to appropriately assess the risk and benefit (48). By referring patients directly to a psychiatrist, the pharmacist was able to discuss concerns with a specialist who could formally assess the patient's mental status and establish if there is a clinical need. This was welcomed by the medical and surgical teams who's concern is the patients overall wellbeing and were happy to receive input from the psychiatric team on this part of the patient's management. This sharing of care and medication reviews would help to support the recently introduced (2015) guidance by NICE on 'Medicines Optimisation – the safe and effective use of medicines to enable the best possible outcomes' (39). This new guidance looks at medication usage and safety and highlights how prescribing is on the increase, with the average number of prescription items per year for any one person in England increasing from 13 in 2003 to 19 in 2013. The NICE recommendations follow on from a paper produced by The Kings Fund in 2013: 'Polypharmacy and medicines optimisation-making it safe and sound' (49). This paper outlined the view that polypharmacy was something to avoid, but proposed an alternative approach to the concept of polypharmacy: that it may have a positive (appropriate) or negative (problematic) potential and as such reducing the number of medicines a person is taking may not be the only factor to consider when reviewing medication. When a medication is prescribed it should be ensured that the intended benefit of the medicines is being realised and that inadvertent harm has not been caused. The involvement of the appropriate medical team in a patient's care as demonstrated here with the acute and psychiatric teams working together should ensure the medication appropriateness as well as reducing the barriers between physical and mental health.

Communication was found to be a problem by both of the pharmacists at the beginning of the process, as it was often difficult to find the required information needed to make a decision on whether a referral was needed. This resulted in a cohort of patients who had their treatment informally discussed between the pharmacist and RAID. The communication did not improve on discharge with incomplete documentation being sent to the GP in both studies. In phase I only a third of the patients seen by RAID had this documented on their hospital discharge paperwork, this was reduced to a quarter in phase II. This was of concern as it is imperative that when patients are transferring between care sectors the documentation is detailed and complete so that any changes to medication are actioned and in the case of mental health behavioural management strategies are implemented. Hospital discharge paperwork was found in both studies to have documented 'no changes to medication made' which wasn't true as antipsychotics had been stopped or the dose reduced following an undocumented RAID review. The prescriptions on the letters were found to be correct with antipsychotics simply not being on the discharge list or the dose change actioned. This poor practice does not make it easy for the GP to establish if the omissions or changes were intentional and is a significant source for further error and patient risk.

Phase III of this research investigated communication between health professionals and looked to evidence the role of the pharmacist as a clinician making evidence based recommendations to treatment in the patients' medical notes. The independent analysis of the pharmacist's contribution to care in phase II found that pharmacists of all levels were documenting clinical information into their patient's medical notes so that a complete record of information was available. This documentation was found to assist the medical team in making holistic and informed clinical decisions as the entries were found to contain valuable information and clinical recommendations. This was felt by the reviewing doctors to reduce the need for psychiatry referrals as pharmacy were able to source and share relevant information appropriately with the medical team. When a referral was made by a pharmacist, this was considered to be clinically appropriate by the reviewing doctors. This information sharing and referral process was

considered to facilitate the safer management of psychiatric patients and provides evidence to support the value of the pharmacist as part of the multidisciplinary team.

Pharmacy routinely gathered information from 3 or more sources before collating them, and documenting the missing information in the notes for the medical teams. No single source contained all the relevant information needed for the medical team to manage the patient effectively (figure 1); likewise, no single healthcare practitioner had access to all sources of information as has already been discussed in chapter V (figure 2). Practically, this meant that admitting doctors clerking psychiatric patients on a medical ward have restricted access to health records which in theory could compromise patient care and outcome. Currently, the only way to narrow this gap is to have ongoing pharmacy input to provide relevant psychiatric information in all medical admissions. To improve this there needs to be a common electronic access point which pools information from all specialties which is easily accessible to the clerking doctor initiating management plans. The wider implications include safer clinical practices and more efficient use of RAID and pharmacy services.

Clinical Information Required	Hospital Medical notes	Hospital clinical data achieve (CDA®)	GP electronic records (Summary Care Records®)[2]	Community Mental Health Records (RiO®)
<b>Mental Health Support Information</b>				
Name of community psychiatric team (Consultant and CPN)	No	No	No	Yes
Contact details of community psychiatric team	No	No	No	Yes
Date of last psychiatric review	No	Possible if reviewed by RAID on a previous admission	No	Yes
Indication for mental health medication	Yes, but only if patient able to give accurate history	Possible if detailed history taken and documented in previous admission	No	Yes
Clinical information on usual baseline mental health status eg: symptoms and behaviour	Only from patient as able at clerking.	Possible if information on behaviour was documented on a previous admission	No	Yes
<b>Current mental and physical health</b>				
Clinical information on current mental health	Yes	No	No	No
Clinical information on current physical health	Yes	No	No	No
<b>Medication Details</b>				

Name, dose and formulation of prescribed medication	Yes, but only if patient able to recall accurately or has own supply present on admission	Yes if details found on previous admission and this was recent.	Only if prescribed by the GP and not the CMHT	Yes
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Figure 1. Availability of clinical information needed to make a referral decision.

Health care professional access to information source	Hospital Medical notes	Hospital clinical data achieve (CDA)	GP electronic records (Summary Care Records)	Community Mental Health Records (RiO)
Medical Team	Yes	Yes	No	No
Nursing Staff	Yes	No	No	No
Pharmacists	Yes	Yes	Yes	No
RAID	Yes	Yes	No	Yes

Figure 2. Healthcare professionals access to information source

The quality and accuracy of discharge summaries for patients in hospital referred to the RAID liaison psychiatry team following pharmacy review were also reviewed in this research. Overall, it was found that documentation of psychiatric review in discharge summaries was not performed in all patient cases, something that is considered to be essential to ensure an efficient transfer of care to the GP on discharge (50, 51). When a patient is referred to the psychiatric team it is recommended that the indication for psychiatric review, details of the review, any medication changes made and recommendations for follow up are documented on the discharge letter (50). Discharge summaries are intended to bridge the discontinuity of care that occurs on discharge from secondary to primary care, providing a summary of events and changes in medication during hospitalisation and facilitating transfer of care back to the GP (52). However, deficits in communication and transfer of information on discharge have been highlighted and may adversely affect patient care (51). Key findings from a 2009 national study by the Care Quality Commission included the need for acute trusts to improve the quality of discharge summaries sent to GPs, and the need for both parties to improve communication with patients regarding their medication at, and after discharge. 81% of general practices reported that details of prescribed medications on discharge summaries were incomplete or inaccurate 'all' or 'most' of the time (53). This figure is unsurprising given the missing information seen here, with nearly half (41%) of the patients reviewed by the psychiatric team not having any mention of this on the discharge summary. An accurate, comprehensive discharge summary has been shown to prevent adverse events and reduce readmissions to hospital (54). Hence accurate, comprehensive transfer of information is essential in ensuring consistency in treatment between secondary and primary care.

## Conclusions

The new PIR service enhances the clinical and timely management of the vulnerable mental health patient in the acute hospital setting and evidences the role of the pharmacist as a key

member of the multidisciplinary psychiatric liaison team. No information was previously available on the ability of a pharmacist to formally refer patients to specialist teams using concerns over medication regimens as a driver for review. The processes involved are complex and there is not one differential that will lead to an automatic referral as all of the study medications and many different diagnoses resulted in referrals, however common themes were identified. In total 69 patients were referred to a mental health team by either the specialist pharmacist or the b7 pharmacist during phase I and II. This highlights how the new PIR service has helped to improve patient access to mental health services during their inpatient admission and ensure that medication was reviewed for benefit vs risk and a prescribing plan actioned. The PIR process therefore addresses the NHS England call for better medicines management in mental illness and the government call for action in dementia (55, 56).

Pharmacy documentation in the medical notes facilitated the safer medical management of patients by alerting medical staff to diagnoses, potential contraindications; prescription errors and potential strategies should the patient's behaviour become a concern during their hospital admission. Information on their usual community mental health team and contact details enabled communication lines to be maintained between care sectors. Information sharing and a multidisciplinary approach is recommended to aid the management of the vulnerable mental health patient admitted to hospital. Access to information is pivotal, only the psychiatric liaison pharmacists had access to all of the information deemed in this study to be essential for the successful inpatient management of the mental health patient in the acute trust. If the care of these patients is to be improved, government recommendations and NICE guidelines followed, this must change. Accurate, comprehensive transfer of information is essential in ensuring consistent treatment in primary and secondary care and can prevent a negative impact on patient care and health outcomes, including adverse events and readmission to hospital (54). The high number of patient discharge summaries containing missing information (41%) highlights the need for continuous improvements in transfer of information and care from secondary to primary care. Further work could focus on the specific structure and detail of discharge summaries, using the Royal College of Psychiatrists Mental Health Discharge Summary standards as a reference.

Access to information and transition between care sectors was found to be a significant problem and will need further investigation to identify ways in which this can be improved. With advancing technology and computer system availability it seems a surprise that a large, fundamental and well established governmental organisation like the NHS can be lacking in such an essential commodity. Although generalisability and reproducibility cannot be evidenced from studies involving only 2 pharmacists it is the start of an exciting venture into the advancing role of the pharmacist and how we can find an alternative role that will take us forward in the changing NHS. This would be an extended role of the clinical pharmacist but could be a way of evolving to support one of the NHS aims of health care professionals working together to provide the best possible outcomes for patients.

## References

1. Joint Formulary Committee. British National Formulary: BMJ Publishing Group; 2013.
2. Katzung BG, Masters SB, Trevor AJ. Basic and Clinical Pharmacology. Chapter 29: Antipsychotic Agents and Lithium: Lange; 2009.
3. Markowitz JS, Brown CS, Moore CR. Atypical antipsychotics. Part I: Pharmacology, pharmacokinetics, and efficacy. *Annals of Pharmacotherapy*. 1999;33(1):73-85.
4. Markowitz JS, Brown CS, Moore CR, Parker NG. Atypical antipsychotics: Part II: Adverse effects, drug interactions, and costs. *Annals of Pharmacotherapy*. 1999;33(2):210-7.
5. Llorente MD, Urrutia V. Diabetes, Psychiatric Disorders, and the Metabolic Effects of Antipsychotic Medications *Clinical Diabetes*. 2006;24(1):18-24.

6. Schneider C, Brooks J, Maidement I. Antipsychotic prescribing in dementia - are we solving the problem? *Aging Health*. 2013;9(1):69-71.
7. Brooks J, Holland K, Hashmi M. Clinical Pharmacy Interventions Pilot and referrals to a liaison psychiatry team. *Royal College of Psychiatry: Liaison Faculty Newsletter*. 2015;15:8.
8. Brooks J, Hashmi M, Hebron B, Schneider C. Increase referrals intelligently and boost access to specialist advice. *Clinical Pharmacist*. 2013;5(6):176-8.
9. Brooks J, Schneider C, Hashmi M, Wilson K, Hebron B. Targeting hospital inpatients by prescribed medication: Improving access to Mental Health Services. *International Journal of Pharmacy Practice*. 2015;28:28-9.
10. Mental Health Network NHS Confederation. With money in mind: The benefits of liaison psychiatry. Briefing; 2011.
11. Schneider C, Balloo S, Hashmi M, Hughes J, Mustafa N, Nabi S, et al. Using hospital pharmacy dispensing records to categorise referrals to the RAID service: a preliminary study. *International Journal of Pharmacy Practice*. 2012;20:35.
12. The Alzheimer's Society. About Dementia 2012 [14/09/2012]. Charity website]. Available from: <http://alzheimers.org.uk/>.
13. Hughes JC. *Alzheimer's and other Dementias*: Oxford University Press; 2011.
14. Working Group for the Faculty of Old Age Psychiatry and Royal College of Psychiatrists. Who Cares Wins: Improving the Outcome for Older People admitted to the General Hospital. Guidelines for the development of Liaison Mental Health Services for Older People. 2005.
15. NHS Choices. Dementia 2012 [Available from: <http://www.nhs.uk/Conditions/Dementia/Pages/Introduction.aspx>].
16. Department of Health. Living well with dementia: A National Dementia Strategy. In: Department of Health, editor.: Crown; 2009. p. 1-104.
17. International Psychogeriatric Association. Behavioural and Psychological Symptoms of Dementia - Educational Pack. Internet: under an educational grant provided by Janssen-Cilag; 2002.
18. Emery V, Olga B, Thomas E. *Dementia: Presentations, Differential Diagnosis and Nosology*. Aston University eBooks: John Hopkins University Press; 2003.
19. Banerjee S. The use of antipsychotic medication for people with dementia: Time for Action. A Report for the Minister of State for Care Services. In: Health Do, editor. UK: Department of Health; 2009. p. 1-62.
20. Cooke E. 1,800 OAPs killed by dementia sedatives. *The Daily Mirror*. 2009.
21. Devlin K. 'Chemical cosh' drugs 'killing thousands a year' *The Telegraph*. 2009.
22. Trigg N. Dementia Drug use 'Killing Many'. *BBC News*; 2009.
23. Bowcott O. Chemical restraints killing dementia patients. *The Guardian*. 2009.
24. Committee on Nursing Home Regulation Institute of Medicine. *Improving the Quality of Care in Nursing Homes*: National Academy Press; 1986.
25. Huybrechts KF, Gerhard T, Olfson M, Avorn J, Levin R, Lucas JA. Differential risk of death in older residents in nursing homes prescribed specific antipsychotic drugs: population based cohort study. *BMJ*. 2012;344:1-12.
26. Krista F, Huybrechts MS, Schneeweiss S, Gerhard T, Olfson M, Avorn J, et al. Comparative safety of Antipsychotic Medications in Nursing Home Residents. *Am Geriatr Soc*. 2012;60(3):420-9.
27. Cayton H, Nori G. *Dementia: Alzheimers and other Dementias: The at your findertips Guide*: Class Publishing; 2001.
28. All-Party Parliamentary Group on Dementia. *Unlocking diagnosis: The key to improving the lives of people with dementia*. 2012.
29. The Alzheimer's Society. *Reducing the use of antipsychotic drugs. A guide to the treatment and care of behavioural and psychological symptoms of dementia.*: Alzheimer's Society; 2011.
30. Department of Health. *Quality outcomes for people with dementia: Building on the work of the National Dementia Strategy*. In: Health Do, editor.: Crown; 2010.
31. Duff H. Take action and help dementia patients. *The Pharmaceutical Journal*. 2012;288:354.

32. Elkins Z. Achieving better care for dementia patients. *Geriatric Medicine*. 2012;2:10-1.
33. National Institute for Clinical Excellence and Social Care Institute for Excellence. Low dose antipsychotics in people with dementia. In: Department of Health, editor. 2015.
34. National Institute for Health and Clinical Excellence. Dementia Quality Standard. In: Department of Health, editor. NICE 2010.
35. Neil W, Curran S, Wattis J. Antipsychotic prescribing in older people. *Age Ageing*. 2003;32(5):475-83.
36. Pullinger W, Dean-Franklin B. Pharmacists' documentation in patients' hospital health records: issues and educational implications. *International Journal of Pharmacy Practice*. 2010;18:108-15.
37. Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. *American Journal of Hospital Pharmacy*. 1990;47:533-43.
38. National Institute for Clinical Excellence and Social Care Institute for Excellence. Psychosis and Schizophrenia in adults: Treatment and Guidance in adults. In: Department of Health, editor. 2014.
39. National Institute for Clinical Excellence and Social Care Institute for Excellence. Medicines Optimisation: The safe and effective use of medicines to enable the best possible outcomes. In: Department of Health, editor. NICE Guidance2015.
40. MHRA. Adverse Reactions 2014 [Available from: <http://www.mhra.gov.uk/Safetyinformation/Howwemonitorthesafetyofproducts/Medicines/TheYellowCardScheme/Informationforhealthcareprofessionals/Adversedrugreactions/>].
41. Schneider LS, Dagerman K, Insel P. Risk of death with atypical antipsychotic drug treatment for dementia: meta-analysis of randomized placebo-controlled trials. *JAMA*. 2005;294:1934-43.
42. Lazarou J, Pomeranz BH, Corey PY. Incidence of adverse drug reactions in hospitalized patients: a meta analysis of prospective studies. *Journal of the American Medical Association*. 1998;279:1200-5.
43. Hill KD, Wee R. Psychotropic drug-induced falls in older people: a review of interventions aimed at reducing the problem. *Drugs and Aging*. 2012;29(1):15-30.
44. Steinberg M, Lyketsos MD. Atypical antipsychotic use in patients with dementia: Managing safety concerns. *American Journal of Psychiatry*. 2012;169(9):900-6.
45. National Institute for Clinical Excellence and Social Care Institute for Excellence. Dementia: Supporting people with dementia and their carers in health and social care. In: Department of Health, editor. NICE Guidance2006 (amended 2011).
46. National Institute for Health and Clinical Excellence. Donepezil, Galantamine, Rivastigmine and Memantine for the treatment of Alzheimer's Disease. In: Department of Health, editor. 217 ed. [www.nice.org.uk](http://www.nice.org.uk)2011. p. 1-84.
47. Gallagher P, Ryan C, Byrne S, Kennedy J, O'Mahony D. STOPP (Screening Tool of Older Persons Prescriptions) and START (Screening Tool to alert Doctors to Right Treatment): Consensus validation. *International Journal of Clinical Therapeutics*. 2008;46(2):72-83.
48. Waqaas Sandoo V, McAughtry A, Mavani F, Conroy S. STOPP/START tool in older inpatients. *Geriatric Medicine*. 2012;27-30.
49. Duerden M, Avery T, Payne R. The Kings Fund: Polypharmacy and Medicines Optimisation - Making it safe and sound. Brown A, editor2013. 68 p.
50. Serfontein J, Dodwell D, Patel P. Psychiatric discharge summaries: what do general practitioners want? *Mental Health Family Medicine*. 2011;8:167-71.
51. 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. *JAMA*. 2007;297(8):831-41.
52. Horwitz LI. Comprehensive quality of discharge summaries at an academic medical center. *Journal of Hospital Medicine*. 2013;8(8):436-43.
53. Care Quality Commission. Managing patients' medicines after discharge from hospital.: Care Quality Commission; 2009.

54. Walraven C, Seth R. Effect of Discharge Summary Availability During Post-discharge Visits on Hospital Readmission. *Journal of General Internal Medicine*. 2002;17(3):186-92.
55. NHS England. High quality care for all, now and for future generations. 2014.
56. NHS Institute for Innovation and Improvement. An economic evaluation of alternatives to antipsychotic drugs for individuals living with dementia. In: Health Do, editor. 2011. p. 1-28.