



Assessing the Compliance of Outpatient Prescriptions to Trust Formulary and North West London Integrated Formulary: A Multisite Audit

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Abstract

A formulary is described as a list of medicines which functions to specify particular medications which under a policy, are approved to be prescribed. This study was carried out to assess compliance of outpatient prescriptions at a tertiary hospital with the hospital's formulary and North West London Integrated formulary. This was a prospective study design carried out across four outpatient pharmacy stores of a tertiary NHS hospital in London. Handwritten prescriptions were collected over 8 week days from 9am to 5pm and were assessed for compliance with the two formularies. High levels of compliance with the Trust formulary and North West London Integrated Formulary were obtained across specialties from the various study sites (98.4% and 98.6% compliance rates respectively). Only 14 (1.6%) drug items prescribed were not within the Trust formulary and 10 (1.4%) were not contained in the North West London Integrated Formulary. Dermatology clinic had the highest number (n= 6) of non Trust formulary items prescribed. Audit standards adopted for compliance with the Trust formulary and North West London Integrated Formulary were achieved. However, few clinics/specialties still prescribed drugs which were not contained in the Trust formulary, thus requiring interventions by the pharmacists. Similarly, some clinics prescribed drug items not contained in the North West London Integrated Formulary.

Key Words: outpatient prescription; formulary; hospital policy; compliance; handwritten prescriptions; NHS Trust formulary;

Introduction

A drug prescription is usually at the endpoint of a patient's interaction with a medical practitioner. It is considered to be a medico-legal document that should be written clearly, accurately and completely (Lofholm and Katzung, 2001). Good quality prescriptions are important in minimizing errors in drug use processes and physicians are expected to adhere to guidelines and set out policies that govern prescription processes (Meyer, 2000). The use of formularies has been shown to aid in reducing prescribing errors (De Vries et al. 2008). American Society of Health-System Pharmacists (ASHP) states that prescribing within a formulary is important in improving medication safety and efficacious use of drugs.

In the United Kingdom, National Institute for Health and Care Excellence (NICE, 2012) describes a formulary as a list of medicines which functions to specify particular medications which under a policy, are approved to be prescribed (for example, the British National Formulary (BNF). NICE further states that the development of prescription formularies is guided by evaluations of efficacy, safety, and cost-effectiveness of drugs. In addition to national formularies, local National Health Service (NHS) Trusts, including Hospital Trusts and Primary Care Organizations (PCOs), produce their own lists of medicines, which are usually a subset of the more comprehensive BNF which in their locality are considered preferable for prescribing.

The North West London Integrated Formulary was introduced in 2012 for use in North West London and contains lists of medicines for adult patients only. It was developed to complement local formularies of the various NHS Trust hospitals so as to provide smooth interface for transfer of care from secondary to primary care levels, and reduce variations in clinical care. It is arranged based on the BNF section order and is intended to cover prescriptions written in primary care and prescriptions by hospital doctors for outpatients or patients being discharged (NHS North

West London Commissioning Strategy Plan, 2012; NHS North West London, 2014). Hence, prescribers need to ensure prescribing within the NWL IF and Healthcare Trusts should ensure prescribers are compliant through regular audits. Studies have shown that monitoring adherence of formulary guidelines may provide a reasonable means of assessing prescribing practices (Kamps et al. 2000). Similarly, the provision of feedback to prescribers on formulary compliance is important as it encourages rational prescribing, evidence based and cost effective prescribing within the health budget (NICE, 2012).

Studies on outpatient prescribing compliance with formularies appear scarce in the literature. Therefore, this present study was a prospective multisite study carried out to answer the question 'is outpatient prescribing of this tertiary NHS Trust hospital in compliance with the Trust formulary and NWL IF?' This study was the first audit since the adoption of the use of NWL IF at the NHS Trust hospital.

Material and Method

Design and Setting

The study was carried out as a prospective audit and data was collected from four outpatient pharmacies of a large NHS Trust hospital. The NHS Trust hospital is located in West London and consists of five hospitals at various locations that provide services to a large population of people. This audit was carried out at four (4) outpatient pharmacies located in three (3) hospital sites of the NHS Trust hospital.

Sample size

A sample size was not calculated for this study as it was assessing current practice and number of prescriptions written each day cannot be predetermined. Therefore, the researcher tried to screen as many prescriptions received in the outpatient pharmacies during the two weeks study period.

Data collection

A data collection tool was developed which contained sections on name of clinic/ specialty, a column list of drug items prescribed, a column which indicates whether a drug item was contained in the local Trust formulary or not and another column if a drug item is contained in the NWL IF or not. This tool was piloted at each site for one day and few amendments were made. Piloting the tool helped the reviewer/researcher gain insight on the work flow at each pharmacy store and become familiar with frequencies and challenges of data collection. After filling in drug details on the data collection tool, the reviewer accessed the drug formularies to ascertain whether the medications were included in the Trust formulary and the North West London Integrated Formulary. Handwritten outpatient prescriptions from various clinics of the Trust received at the outpatient pharmacies were screened. Electronically generated prescriptions for chemotherapy and those from the fertility clinic were excluded in this study.

A strategy was adopted to collect data from two sites per week by collecting data on Monday and Tuesday between 9am to 1pm at one site; then between 2pm to 5pm at another site and on Thursday and Friday, a switch was made from the site for morning data collection and afternoon data collection. The same process was adopted the following week for the other two sites. This strategy was adopted so as to collect data that represents various clinics/specialties and also reflect similarity in data collection across the sites thereby reducing chances of introducing bias.

Audit standards

Audit standards (Table 1) were adopted for this study based on the recommendations of National Institute for Health and Care Excellence (NICE) and the NHS Commissioning Board 2013/ 2014 report for commissioning for quality and innovation (CQUIN).

Statistical analysis

Data collected was entered into Statistical Package for Social Sciences (SPSS) Version 21.0. A descriptive analysis was carried out with discrete measures summarized using means and standard deviations while categorical measures were summarized using counts and percentages.

Ethics application

Ethics application was made at University College London School of Pharmacy and audit registration process was completed at the NHS Trust hospital before commencement of data collection. This study was carried out as an audit and did not collect patient identifiable information; hence a

National Health Service (NHS) ethics approval was not required.

Results

A total of 1808 outpatient prescriptions were received at the four outpatient pharmacies over eight days of data collection; but only 533 were included in this study as these were received when the reviewer was present at the pharmacy stores. These 533 prescriptions were found to contain a total of 850 drug items. The average number of items per prescription was 1.64 (± 0.898) where the minimum number of items on a prescription was one (1) and the maximum nine (9). Prescriptions were collected from forty five (45) clinics across the NHS Trust hospital, with the largest number being from Emergency unit (67; 12.6%), followed by Oncology (49; 9.2%) and Dermatology clinic (44; 8.3%). Also, majority of the drug items were found to be from Emergency unit (98; 11.5%), followed closely by Dermatology (82; 9.6%) and Oncology Clinic (81; 9.5%).

Table 2 shows the number of prescriptions received from various clinics/ specialties and total number of drug items prescribed during the data collection period.

Compliance with the Trust formulary

Out of a total of 850 drug items, 836 (98.4%) were found to be items included in the Trust formulary with only 14 (1.6%) items found to be non Trust formulary items. A standard of 95% was adopted for adherence to Trust formulary, thus it can be said that the standard was met. Items which were prescribed out of the Trust formulary could not be dispensed and required interventions to be carried out by the outpatient pharmacy staff. Some of the drug items had to be changed by the prescriber to other medications while some required other interventions. Table 3 summarizes the non Trust formulary items prescribed, the clinic they were prescribed at, and the resultant action required.

Compliance with North West London Integrated Formulary

In assessing compliance of outpatient prescribing with NWL IF, it is important to note that certain items are exempt from this formulary as stated in the NHS Trust hospital Commissioning for Quality and Innovation (CQUIN) guidance and thus, were not included in this assessment. These items include 67 (7.9%) pediatric medications, 72 (8.5%) were red listed medicines and 8 (0.9%) were unlicensed medicines. Of the remaining 703 items, 693 (98.6%) were included in the NWL IF while 10 (1.4%) were items prescribed which were not. Table 4 provides a summary of number of items not included in the NWL IF and their clinic of origin.

Table 1: Audit standards adopted

Criteria	Standard adopted
Compliance with the Trust formulary	$\geq 95\%$ of items prescribed should be within the Trust Formulary, based on agreed Key Performance Indicators
Compliance with North West London Integrated Formulary	90% of items prescribed should be within with the NWL Integrated Formulary

Table 2: Table showing number and percentage of prescriptions collected per clinic/ specialty and number of items prescribed

Clinic/ Specialty	Number (and percentage of prescriptions received)	Number (and percentage) of drug items prescribed
Emergency	67 (12.6)	98 (11.5)
Oncology	49 (9.2)	81 (9.5)
Renal	44 (8.3)	61 (7.2)
Neurology	26 (4.9)	27 (3.2)
Tuberculosis	12 (2.3)	31 (3.6)
Radiotherapy	7 (1.3)	16 (1.9)
Urology	8 (1.5)	9 (1.1)
Chemotherapy	8 (1.5)	22 (2.6)
Eye	5 (0.9)	5 (0.6)
Dermatology	44 (8.3)	82 (9.6)
Gastroenterology	18 (3.4)	24 (2.8)
Haematology	13 (2.4)	19 (2.2)
Surgery	6 (1.1)	7 (0.8)
Chest/Respiratory	10 (1.9)	14 (1.6)
Cardiology	2 (0.4)	2 (0.2)
Ear, nose & throat	27 (5.1)	49 (5.8)
Hepatology	4 (0.8)	8 (0.9)
Lipid	3 (0.6)	4 (0.5)
Pain	5 (0.9)	5 (0.6)
Endocrinology	15 (2.8)	20 (2.4)
Gynaecology	5 (0.9)	9 (1.1)
Outpatient		
Vascular	2 (0.4)	4 (0.5)
Antenatal	8 (1.5)	10 (1.2)
Colorectal	4 (0.8)	9 (1.1)
Genito Urinary Medicine	14 (2.6)	20 (2.4)
HIV	32 (6.0)	75 (8.8)
Psychosexual	16 (3.0)	24 (2.8)
Clinical Assessment Unit	19 (3.6)	29 (3.4)
Rheumatology	26 (4.9)	41 (4.8)
Others (Bariatric, Joint, Paediatric, Multiple sclerosis, Foot, Osteoporosis, Orthopaedic, Migraine, Plastic, Diabetic, General Outpatient)	34 (6.4)	45 (5.3)
Total	533 (100%)	850 (100%)

Table 3: Summary of non Trust formulary prescribed items

Non Trust Formulary Item	Clinic of Origin	Action Taken¹
1. Pliazon cream	Oncology	Drug change to E45
2. Ibuprofen gel	Orthopaedic	GP/OTC
3. Uvistat lipscreen	Dermatology	GP/OTC
4. Xyzal 5mg	Dermatology	GP
5. Epiduo gel	Dermatology	GP
6. T-gel shampoo	Dermatology	GP/OTC
7. Etrivex shampoo	Dermatology	Drug change to Betnovate scalp
8. Etrivex shampoo	Dermatology	Drug change to Minoxidil 5%
9. Nasal douche ²	ENT ⁴	GP/OTC
10. Nasal douche ²	ENT	GP/OTC
11. Sterimar salt spray	ENT	GP/OTC
12. Fexofenadine 120mg	ENT	GP/OTC
13. Forceval capsules ³	HIV ⁵	Drug change to Multivitamins
14. Escitalopram	Multiple Sclerosis clinic	GP/OTC

Table 4: Clinics and number of Non NWL IF items prescribed

Clinic/Specialty	Number of Non NWL IF Items Prescribed
Emergency	2
Dermatology	3
Oncology	2
Ear, nose and throat (ENT)	1
Gynaecology Outpatient	1
Orthopaedic	1
	10

Discussion

This research, the first of its kind since the adoption of North West London Integrated formulary, has been carried out to assess the compliance of outpatient prescribing practice with the Trust formulary and North West London Integrated formulary and has indicated that this was done within the standards adopted. Although 98.4% and 98.6% compliance with the Trust formulary and NWL IF were met, it is of importance to identify the clinics/specialties which prescribed out of these formularies. The National Institute of Healthcare and Clinical Excellence (NICE) describes that formularies exist to specify which drugs are available on the NHS. These drugs have been evaluated for efficacy, safety and cost effectiveness and prescribers are encouraged to prescribe from these approved medications.

There is a paucity of data in comparing these results with literature. However, based on documented cases of non formulary prescribing kept by the various outpatient pharmacies of this NHS Trust, the log showed that in the month of May 2014, a total of 39 drug items were prescribed which were not contained in the Trust formulary and majority of these items were from the dermatology clinic, followed closely by pediatric allergy clinic. The results from this present study similarly showed that dermatology clinic prescribed the most non Trust formulary items over the eight days data collection period. Understanding the causes of these non formulary prescribing may require further qualitative studies which identifies the prescribers and discuss with them on their decisions. It may be that the prescribers were unaware of the items not being in the formulary, or the patients may have used them previously in other settings and requested for their prescription.

Amongst the implications of non Trust formulary prescribing is that patient satisfaction with the pharmacy services could be affected due to increased waiting times as this is evident from the fact that pharmacy staff spend extra time in trying to contact prescribers where a non formulary item is prescribed. A study in the U.S found that it was labor intensive for pharmacists to attend to prescriptions containing non formulary drug items. There were also additional time commitment and labor costs associated with non formulary item requests (Pieter et al, 2014).

In the case of this NHS Trust, patients are also affected as at times, patients are required to return back to the prescriber in order to effect changes on the non Trust formulary prescribed item. At other times where the drug item could be purchased over the counter, patients are given the option of purchasing it as an over the counter (OTC) product or asked to obtain it from the General Practitioner (GP), which could have a resultant effect on patient satisfaction.

Regarding the items identified which were not included in the North West London Integrated Formulary; the implications for such may not be directly evident at the hospital especially in the situation where the drug item is actually included in the Trust formulary but could pose a challenge when it is not possible for a GP to be able to prescribe it. As described by the NHS Commissioning Strategy Plan 2012, the North West London Integrated Formulary was introduced to ensure continuity and smooth transition of care from secondary to primary care, hence, making it important for prescribers to ensure they are conversant with it and prescribe within the formulary. Hospitals are also then required to update their local formularies to be in line with the North West London Integrated Formulary. However, it is impossible for a formulary to be created that covers all clinical scenarios (Pieter et al, 2014). In the United States, the Joint Commission (an organization that accredits and certifies

healthcare organizations and programs) states that hospitals are expected to have a mechanism of obtaining alternatives when the use of a formulary time is not in the best interest of the patient.

In addition, it is important to constantly update prescribers on availability or changes made regarding the status of drug items in formularies. Patient safety may be compromised due to a prescriber's unfamiliarity with non formulary medications. Inexperienced prescribers also need more training in safe and rational prescribing for implementation in clinical practice (Harding et al, 2010).

In the U.K, periodic meetings such as the New Drugs Panel meeting where representatives of various Clinical Commissioning Groups (CCGs) in an area meet to make recommendations on drugs inclusion/ exclusion from the formulary are relevant.

Non formulary drugs which are commonly prescribed can be raised and deliberated for inclusion into the formulary. Similarly, prescribers can fill in a request drug form which can be submitted via their Trust drug panels to the North West London committee for recommendations on drugs which need to be included in the North West London Integrated Formulary. However, a potential advantage of a limited formulary is that the resource-intensive activity of evaluation of new drugs to include in a formulary is reduced (Pieter et al, 2014). More medications in a formulary could also lead to increased medication errors as prescribers are expected to familiarize themselves with more medications.

It is evident that clinical decision, for example in prescribing, is a complex process which depends on human ability to provide attention, memorize and recall essential information (Agrawal, 2009). It is believed that information technology (IT) systems are effective in connecting this 'knowing-doing' gap (Pfeffer and Sutton, 2000). These may thus be relevant in prescribing processes as they provide means where prescribers can ensure compliance with formularies. Studies have been carried out to ascertain effects of electronic prescribing on formulary compliance. A study by Fisher et al. in 2008 found that electronic prescribing with formulary decision support (FDS) was beneficial in prompting physicians to prescribe within a formulary, thus providing cost benefits amongst other benefits. Fisher et al. (2008) further state that provision of electronic prescribing with formulary decision support enables the prescribing of preferred medications more frequently. Prescribers would then be able to have decision support and reminders when prescribing which alerts them on any non formulary item. However, implementation of electronic prescribing usually involves huge financial costs, training, workflow redesigns and regulatory challenges (Dainty et al. 2012).

Foremost among the limitations of this study was the limited data collected and constrained data collection period which may not be sufficient to accurately provide a clear image of outpatient prescribing at the Trust. A systemic, periodic review of all outpatient prescriptions would likely have provided the opportunity to obtain a wider image of the nature of outpatient prescribing at the Trust.

Another limitation is that the reviewer did not have the opportunity to communicate directly with patients nor with prescribers, thus, the reviewer could not have understood the reasons behind a prescriber's decision to prescribe a drug item out of the two formularies considered. Reasons which may result in such could relate to a patient who is already on a medication and a prescriber becomes skeptical of making a change to that medication, even though it is not contained in the Trust formulary.

Future studies should employ a strategy where the

researchers obtain detailed information on patients' medication history by gaining access to patient electronic hospital records (that is, the JAC Medicines Management software). Similarly, a qualitative approach could be included in future studies where prescribers are interviewed to understand reasons behind drug prescriptions not contained in a formulary. Furthermore, a study that collects all prescriptions issued at a period and reviewed by a team may provide a better representation of outpatient prescribing practice.

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