



Safe Prescription for Junior Doctors in Accordance with All Wales Prescribing Standards

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Significance:

Prescribing errors are quite common and according to one estimate out of 100 patients admitted into UK hospitals 15 will have some form of prescribing error in their records. It is a general understanding that most of the time these errors are made due to lack of awareness. Severity of these errors can range from minor to major mistakes that can lead to fatal results. A simplified anonymous approach of identifying these errors and then using a step wise approach to educate the prescribers' especially junior doctors can be quite fruitful in reducing these errors.

Abstract

Background: Prescribing errors are quite common and according to one estimate out of 100 patients admitted into UK hospitals 15 will have some form of prescribing error in their records. It is a general understanding that most of the time these errors are made due to lack of awareness. Severity of these errors can range from minor to major mistakes that can lead to fatal results.

Materials and Methods: A simplified anonymous approach of identifying these errors and then using a step wise approach to educate the prescribers' especially junior doctors can be quite fruitful in reducing these errors. Unfortunately there are not many studies or projects available to back our proposal however these seems a logical way forward and is exactly what we have shown in our study.

Results: We performed a prospective snapshot study involving 100 inpatients to get baseline measurements. The errors and mistakes were identified and fed back to the junior doctors in an anonymous manner. Clear & legible writing, frequency of use, responsible consultant name, allergy box filled, VTE assessment, oxygen prescribing and labeling of medication discontinuation were the most common negligence identified. At the same time junior doctors were reminded of local prescription standards and guidelines which usually don't form part of induction.

Conclusion: Multiple deficient areas were identified during this audit like legible writing, dosage frequency, VTE prophylaxis and oxygen prescription. It was highlighted to junior doctors how important are these components as they play a key role in patient getting better after medical review. Above mentioned steps did improve prescription errors to an extent, but aim should be to achieve 100% results. Repeated reminders are

important in this case as that helps to improve practice and avoid clinical accidents.

Introduction

Medication error is a flaw in the process of formulating, dispensing, managing, prescribing, monitoring or providing advice on medicines (1). These errors can increase patient morbidity, mortality and in turn can lead to prolonged hospital stay with its financial complications. Patient complaints and dissatisfaction is another aspect. Prescribing error (PE) is the most critical among all kinds of medication errors (2). In United Kingdom hospitals, prescribers make errors in 1.5% of prescriptions; and in primary care errors occur in up to 11% of prescriptions (3). The impact of prescribing errors is augmented by the sheer frequency of prescribing that was 637 million in 2000 and make up 12.3% of National Health Service (NHS) costs (4,5). An article titled 'Good practice in prescribing and managing medicines and devices' published by General Medical Council in 2013 clearly states that we need to continuously improve our prescribing skills as healthcare professionals. It also tells us how to closely work with our colleagues which improves communication and decrease chance of prescription errors (6).

Medication error is one of the major factors responsible for patient harm and PEs are the most common yet preventable causes of medication errors. Junior doctors are mostly involved in prescribing for newly admitted patients as part of their admission clerking. Due to increase in workload in NHS it isn't uncommon for a stressed, overworked junior doctor to make an unintentional error. Though there are checks at multiple levels as the clock moves on however, mistakes are bound to happen. Prescribing is a relatively abandoned expertise therefore a substantial resolution is only possible through a range of diverse measures rather than a single and a straight step (7).

Materials and Methods

Baseline measurements were recorded using a data collection tool which was formulated in accordance to all Wales prescribing (AWP) guidelines. Data was collected by same junior doctor by going through 100 in-patient prescription charts which were picked randomly on medical and surgical wards. A random week was chosen in December 2017 for initial stem of study. Prescription charts were reviewed for multiple

things like name, formulation, dose, route and frequency of medicine for which British National Formulary (BNF) was kept as standard. Subjective factors like clear & legible writing and signature of prescriber was decided after consulting ward pharmacist and senior sister. If both of them agreed that whatever is written on prescription chart is illegible only then it was taken into account.

Following graphs (Figure 1 & Figure 2) show the baseline measurement of different components accessed during the study.

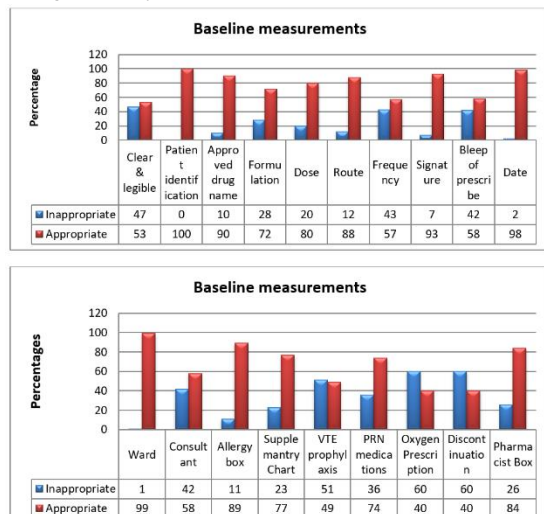


Figure 1: Baseline Measurements of Prescription Categories

Problems identified included unclear and illegible writing which was making it difficult to identify the prescriber as well as the name, strength and route of administration. It's clear that if nursing staff or pharmacist has to chase doctors to correct the drug chart that will lead to delay in administration of medications. Errors were made when writing the frequency medications (like antibiotics- ciprofloxacin 500mg three times a day and inhalers twice a day). 42% of doctors were not writing their bleep numbers which made it difficult to give feedback after errors identified. Responsible consultants name wasn't written in 42% of cases. 11% of allergy boxes were not filled which put those 11% at possible risk of fatal allergic reactions. Venous thrombo-embolism (VTE) prophylaxis which is a crucial part was poorly filled-only 49%. Patient who were receiving oxygen were not prescribed which creating confusion amongst nursing staff when it comes to maintaining oxygen saturations. In 60% cases doctors were not aware of what AWP guidelines want on charts when discontinuing medications. One of the multiple checkpoints made for patient's safety is pharmacists but 26% of charts were not being reviewed.

Drug charts are essential element to management of patients. "Plan Do Study Act-PDSA" project was designed after baseline study to help minimize in-patient prescription chart errors. All junior doctors were focused who write drug charts and in all teaching sessions pharmacists were involved to give insight to junior doctors about problem faced due to prescription chart errors.

PDSA1: Results of baseline study was presented at hospital audit meeting followed by discussion and formal lecture about AWP guidelines. This was followed by posters to remind doctors about avoiding prescription errors.

PDSA2: All pharmacists were involved in study who were mainly working on wards. They provided individual feedback to ward doctors who they knew better when prescription errors were spotted. Every week a meeting took place between audit team and pharmacists where all the prescription errors were discussed and what and how feedback was provided to doctors.

PDSA3: Multiple 2-hour teaching sessions were organized for junior doctors where a brief assessment of knowledge about prescription errors was checked using 10 multiple choice questions followed by discussion in presence of pharmacists. This happened over a period of 2 months.

Results:

Following table shows the comparison of 1st cycle done before implementing changes and 2nd cycle after implementing changes. We successfully achieved improvement in few of the components but there was still room to improve.

As stated in table 1 main areas which need improvement are highlighted in red color. Legible writing was still the issues (53% to 63%) and this is something which can be difficult to address. We emphasized writing in capital letters to improve legibility. Frequency of usage of drugs improved slightly from 57% to 60% when doctors were reminded repeated to consult BNF or ask pharmacist before prescribing. Still a lot of prescribers were not writing their bleep number (58% versus 60%). VTE prophylaxis which important part of management was missing from 53% of charts as compared to 49% in baseline measurements. Oxygen prescription on charts improved from 40% to 55%. With medication discontinuation drawing a "Z" line on the chart at the end of prescription was a weak area still (40%-1st cycle to 55%-2nd cycle).

Due to sensitivity of matter we wanted to make sure that further improvement is achieved, and previously implemented changes have improved clinical practice

we performed 3rd cycle of study to compare results with previous two cycles and results are shown below.

Table 1: Comparison of 1st, 2nd& 3rd audit cycles.

	1 st Cycle	2 nd Cycle	3 rd Cycle
Clear & legible writing	53%	63%	65%
Formulation of drug	72%	74%	80%
Dose of drug used	80%	85%	86%
Route of administration	88%	92%	92%
Frequency of use (times a day usage)	57%	60%	70%
Signature of prescriber	93%	94%	92%
Bleep of prescriber	58%	60%	63%
Responsible consultant name	58%	65%	70%
Allergy box filled	89%	90%	96%
Supplementary chart mentioning	77%	83%	91%
VTE assessment	49%	53%	60%
PRN medications	74%	75%	73%
Oxygen prescribing	40%	55%	63%
Medication discontinuation	40%	55%	75%
Pharmacist Box filled	84%	85%	82%

As shown in table 1, number of legible charts increased to 65% as compared to 53% initially. Improvement as apparent in direction/frequency of usage of drugs to 70% from 57% initially. Still a lot of prescribers are not writing their contact numbers despite repeated reminders. Allergy boxes are important on medication charts before any medication is administered in which case 96% results were achieved as compared in 89% initially. Only 11% improvement was seen in VTE prophylaxis prescriptions and this is an important area which needs further improvement. 63% charts had oxygen prescribed on them which was better than 40% charts initially. Junior doctors showed improvement in the way medications are discontinued from the prescription charts- 70% in 3rd cycle as compared to 40% in 1st cycle.

Discussion

AWP guidelines is an important tool in learning how to improve day to day clinical practice. There is clear guidelines about general prescription writing and also specific instruction for inpatient drug charts (6). While writing any prescription it's important to mention patient's identification which is most important things and writing should be clear and legible. Drug name should not be abbreviated neither chemical description

e.g. ISMN should be written in full (Isosorbide Mononitrate).

The bioavailability of the drugs especially tacrolimus, mycophenolate, cyclosporine, anti-epileptics, diltiazem, modified release theophylline and different formulations of insulin, vary from one brand to the other; hence it is recommended that these drugs should be advised according to the brand name to rectify the error. It is important to mention if a drug is modified release versus immediate release as strength may vary considerably. If a drug (e.g. insulin & inhalers) has to be administered via a special device then do mention it in written. Preclude mentioning the unnecessary decimal points e.g. write 5mg instead of 5.0mg and if it is less than gram then use milligram e.g. 500mg instead of 0.5g. Appropriate short forms for routes of administration are "I.M" for intramuscular, "I.V" for intravenous, "SC" for subcutaneous, "PO" for per oral, "S/L" for sublingual, "NEB" for nebulization, "BE" for both eyes, "LE" left eye, "RE" right eye, "PR" for per rectal and "PV" for per vaginal administration. Clearly mentioning the dosage frequencies is also vital and especially the unusual like weekly and monthly. Lastly always pen down the signature and date that is must for identifying the prescriber (8).

"Requirements for Prescribing and Recording Administration on the All-Wales In-patient Medication Record charts"

- A new chart must be written for each admission, and the chart discontinued (by crossing through the front page) when the patient is discharged
- Charts that are no longer in use (e.g. administration record is full) must be crossed through; signed and dated ensuring information on the chart is not obscured.
- Patient's name and health record number must be stated on each page of the chart to reduce the risk of prescribing and administration error
- Allergy box to be completed for every patient before giving medications
- Write about Hospital, ward and consultant under whom patient is being treated
- Ideally weight and height should be mentioned on all charts as medications like enoxaparin need to be prescribed according to weight
- As a general rule, drugs prescribed on supplementary charts (e.g. Warfarin) should also be recorded on the main chart, with a reference to the supplementary chart on the prescription.
- All patients must have the VTE section completed on the front of the medication chart. This section MUST be completed even if a separate assessment form has already been completed.

- Once only medicines and as required medicines (Record times using 24-hour clock format)
- Date, Route, dose & dose change needs to be clearly documented on all drug charts
- Oxygen section must be completed when a patient requires oxygen therapy. Oxygen is a prescription only medicine and must be prescribed. Circle the required saturation range as per the instructions on the chart.
- When a medicine is discontinued this must be clearly indicated by marking “Z” through the drug name and the end of the treatment. The discontinuation order must be signed and dated.
- Limited courses of treatment (e.g. antibiotics, steroids) should have a bar line marked on the chart to indicate the end of treatment, and when the course is finished the prescription should be crossed through as above
- A pharmacist’s signature in this box indicates that the prescription has been screened for accuracy and appropriateness
- If a dose of medication is not administered for any reason, the appropriate code must be entered on the chart, and an entry made in the patient’s records as appropriate
- Each section allows for up to three administrations against one prescription for continuous infusions. The prescriber must initial the appropriate box (blue on adult chart, white on the new paediatric chart) to indicate that a continuous infusion is required (8).

Junior doctors while being on-call are very busy due to burden of work. It is possible to make mistakes while prescribing as all of us are humans. It’s important that there are multiple check points after a drug chart is written. Continuous reminded about prescribing errors can reduce chances of error which can be visual, in the form of posters, or verbal, in the form of repeated audit results presentation. Pharmacists play a key role in identifying prescription errors but due to NHS being short staffed we are struggling from that point (9).

Conclusion

Multiple deficient areas were identified during this audit like legible writing, dosage frequency, VTE prophylaxis

and oxygen prescription. It was highlighted to junior doctors how important are these components as they play a key role in patient getting better after medical review. Above mentioned steps did improve prescription errors to an extent, but aim should be to achieve 100% results. Repeated reminders are important in this case as that helps to improve practice and avoid clinical accidents.

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Human/Animal Rights: No human or animal rights are violated during this study.

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