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Root Causes of Medication Error and Steps to Defeat Errors

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ABSTRACT

The overview of a medication error and certain types of error that could cause patients medication plan to turn into a wrong way. Medication error also could lead to many other unwanted outcomes that could be harmful to patient. The types of medication errors that normally occur with its explanation are given. A potential error from the prescriber is explained and the error from the perspective of patient is also mentioned. There are certain steps that can be taken in order to overcome these medication errors and how a patient can react in order to overcome these medication errors. An example of a medication error case study is also presented with the discussion on the error.

Keywords: Causes, medication error, steps, errors.

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INTRODUCTION

A medication error is any preventable event that may cause or lead to inappropriate medication use or client harm while the medication is in control of health care professional client or consumers[1]. Medication error is an error that can be prevented by taking few measures. What is a medication error? In a normal term medication error it means that an error occur in the treatment plan. There are various errors that can take place which can cause serious problems to the patient. Below are some example of types of errors and the fundamental causes of error,

- When a medication is chosen for a patient by the physicians it should be rational with a strong reason on why the medication is choosed over other medications for the patients. But at times the reason for choosing a medication is irrational, at times due to inadequate knowledge the physician choose a inappropriate medication that is not effective and due to under prescribing or overprescribing also.
- Another major cause of medication error is the prescription writing, due to errors in the prescription and the illegibility.
- Wrong strength and dose is a common cause of errors that could lead to organ failures and could cause fatal.
- Even when a medication is dispensed there are high chances of error to occur due to wrong patient, wrong formulation and wrong labeling of the medication.

Failure in a treatment plan can be due to the medication error or due to patient compliance itself, but the major cause of the failure in the treatment plan is contributed by medication error[2]. The term here means that the failure in the treatment, this can be due to patient compliance, or can be due to the prescriber or due to the pharmacist who is dispensing the medication. It depends who is the cause of the medication error. Medication error can also be due to the failure of the medication plan to be completed as intended, or the use of an incorrect medication plan to achieve a goal. Examples of certain medication errors are

- HYDROXYZINE HCL 50 mg for HYDRALAZINE HYDROCHLORIDE 50mg
- .5mg XANAX is mistaken for 5mg of XANAX
- Amoxicillin for Ampicillin

This medication errors could lead to many fatal and many other secondary causes that could be a threat and could not be cured. Medication error are things that are taking place in a healthcare setting on a daily basis. Certain hospitals have implemented plans that could reduce the

medication errors and yet there are mistakes that are taking place. This is due to carelessness with lack of attention, knowledge and many other factors.

MATERIALS AND METHOD

The methodology here is based on the observation and studying the cases in a hospital to measure and ensure the Types of medication error. By the observation the types and the cause could be diagnose and the steps to prevent the medication error could also be identified and it could be suggested. The example of the form is attach as a prove of the methodology and how it was done.

TYPES OF MEDICATION ERROR

Omission Error

Ommision error it means that the failure healthcare profession to administer the recommended dose to the patient before the next dose timing is commenced.

Wrong Timming Error

As the title mentions that the timing factor could also cause error. If a medication is not taken on the designated time it could also cause to an error, some patient skip a dose during the designated time and consume double dose on the next designated consuming time. This could lead to overdose and could be a toxicity problem also.

Errors Due to Prescriber

Prescribers can also be a major factor causing the medication error to occur. Prescriber that has lack of knowledge on the certain drug is a cause also a contributing factor[3]. If the prescriber has less knowledge about a drug then the prescriber could not determine if that particular drug is suitable for the patient or not based on the patient's condition, this could be a cause to make the treatment plan to be a failure. When the prescriber has lack of knowledge on the contraindication and the indications then this could be something that is dangerous. Normally a prescriber only can prescribe a medication to patient after diagnosing the patient and getting to know the patient's condition well. If the prescriber fail to be well versed in the medication that is about to be prescribe then the treatment would be a failure. The prescriber has to also consider the patients conditions such as allergies, pregnancy and co-morbidities. If the patient do not consider all this then the medication could cause more harmful effect to the patient comparing to good outcome.

- Wrong patient
- Wrong dose

- Wrong time
- Wrong drug
- Wrong route

Dispensing a medication to a wrong patient is something that happens even till today, the best way to overcome this is by asking the patient their name and to confirm that before the medication is dispensed. By practicing this we can overcome the problem of wrong patient which is also included as part of medication error. Even patient should be alert to see the name stated of the medication to overcome this problem of medication error. Wrong dose is something that is very crucial as we know medication could cause many problems by just a slight increase in the medication dose. Moreover drugs with a narrow therapeutic index like example DIGOXIN could be threat to life. Drugs with narrow therapeutic index have to monitor through therapeutic drug monitoring system (TDM) [4]. Drugs such as Paracetamol taking in a wrong dose could lead to hepatotoxicity[5]. Wrong timing of medication or wrong frequency of medication is also considered as a medication error. Wrong timing of medication could not produce the desired effect of the drug this could lead to failure in the drug treatment plan. For example drug that is used for treating peptic ulcer the proton pump inhibitor (Omeprazole, Pantoprazole) have to be taken 30mins before meal to suppress the acid production[6]. By taking the drug in a wrong time the treatment plan would not be achieved. Prescribers that prescribe wrong drug is a major cause of medication error. This confusion can be due to the drugs name.

Figure 1: Example of Look a like Drugs

Example of sound a like drugs

1) AMLODIPINE – AMIODARONE
2) HUMALOG – HUMULIN
3) AMITRIPTYLINE – AMINOPHYLLINE
4) BISACODYL – BISOPROLOL
5) DOBUTAMINE - DOPAMINE

This could be a major cause that prescriber prescribe the wrong drug to the patient. This is a leading factor of medication error that causes patients life to be in threat. Wrong route of a medication is also a cause of medication error. Medication that suppose to be administered via intramuscular but the medications is administer via intravenous could cause complication to the patient[7]. Drugs if not given in the intended route could not produce the desired outcome; this would lead to a main factor of treatment failure in the patient. At times the reason behind the wrong route of medication is due to lack of training in administering the medication[8]. Handwriting is a factor that leads to many medication errors as prescribers do not write it in a tidy way which causes misinterpretation of the prescription and this also increases the workload of the pharmacist.

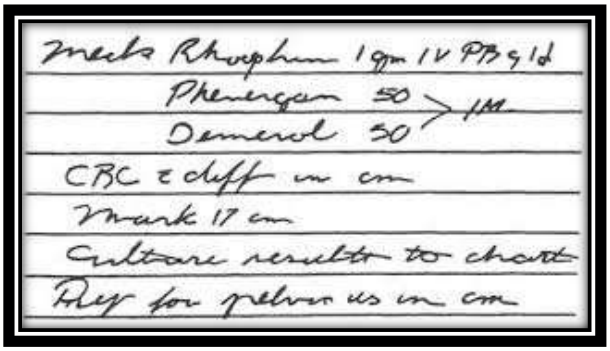

Figure 3: Example of untidy writing on a prescription

Example of physicians' handwriting that could not be read and this is a factor that causes much medication error. Verbal communication is also a fact that causes a medication error. Lack of clear communication skill can cause medication error[9]. Inadequate information in the prescription can also lead to medication error. Because medication is dispensed based on the order in the prescription thus when the dose ,frequency or the medication name not written properly it could cause medication error.

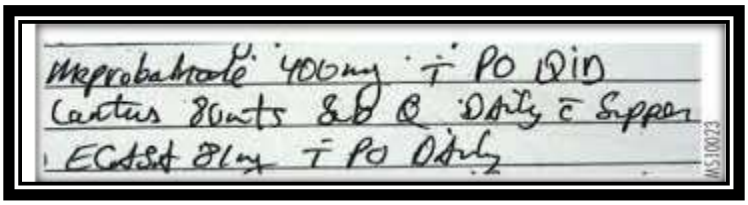

Figure 4: Unclear units and dose on a presription

In certain situation staffs in the hospital could also be a factor that leads to medication error and this is due to the circumstances.

- Pressure
- Lack of experience

- Multitasking
- Failure to check
- Poor communication.
- Absence of safety cultures in the workplace

Errors Due to Patient

Medication error can also be due to patient and patient itself can be a cause to the failure to the treatment plan[10]. This is stated because patients do not take active role in their own medication use, by having this attitude of being careless can contribute to the errors. Patients need to be actively involved in their medication plan to ensure there is a positive outcome and they follow the orders that are given by the physician or the pharmacist. Another factor that could cause medication error from the patients prospective is due to the fact that patients have more than 1 doctor. They might be consulting with few doctors for a disorder and this could lead to confusion within the patient. Different physicians have a different treatment plan for each patient so by having few doctors it could lead to confusion and could lead to medication error, and then finally the treatment plan will be a failure[11]. Patient compliance is also an issue that could cause a medication error in patient[12]. At times there are certain patient who does not reveal much about their disease conditions and other co-morbidities to the physicians and this could be a factor that leads to medication error in patients. Patients who are on poly pharmacy should take more care and be more active in their treatment plan as they are having few medications to be taken at a time thus this could lead to medication error[13]. Patients who cannot communicate well with the doctors also could be a cause of medication error[14].

Steps to be Done to Overcome Medication Error

There are certain measures taken to overcome the medication error problem in the healthcare setting. “Prevention is always better then cure”, thus certain steps have to be taken in order to overcome the medication error problems. There will be a great impact and reduce in rate of medication error if the healthcare professionals start implementing measures to overcome the medication error problem.

- Always double check "high-alert drugs" by doing independent calculations. By double checking the medication it can prevent many medication errors and added on to this proper labeling should be done for medications that look alike or sound alike. Thus this can make the person who handling the drug to differentiate the drug well and will reduce medication

error. By developing this checking habits errors can be reduce and patient's life won't be in threat.[15]

- Using generic name is also a good way to overcome medication errors, as that would be a common name and the pharmacist would know the best brand drug to be given in that particular generic name. Physicians also should practice a good writing skill with a complete prescription with the full name, dosage form, strength, frequency. Physicians should practice being more careful when the prescription is written[16].
- The prescriber should know the medication well before the medication is prescribed in taking into consideration of the patients conditions such as, allergies, co-morbidities, other medication, pregnancy and breast feeding, patients' size. By taking all this into consideration then the prescriber should prescribe the drug. In order for this to take place in a smooth way the prescriber should know well about the drug. Thus prescriber should do a good homework on the medication they prescribed.
- The prescriber should also question the patients on any other medication and OTC medication and the dietary supplements by knowing all this conditions then the prescriber can know the drug- drug interaction, drug –food interaction and etc.
- The prescribed should use memory aids such as textbooks, the primary source, secondary source, and the tertiary sources for a better confirmation of the medication information to avoid errors.
- There are some abbreviation that is used in the prescription which could cause confusion and this could also lead to medication error also.The bottom line is that healthcare professionals should write out the words rather than using commonly misread symbols or abbreviations.
- Another key reason for prescription error is using a "trailing zero" *after* a decimal point when writing a dosage. This can lead to a 10-fold medication error. For example, writing a medication dosage as 1.0 mg may be misinterpreted as 10 mg, if the decimal point is not seen. However, a zero should always *precede* a decimal point. For example, a medication written as .1 mg could be misinterpreted as 1 mg if the decimal point is missed, leading to a patient receiving 10 times the amount of medicine needed. In this case, the zero should precede the decimal point, as in 0.1 mg.
- Sufficient amount of healthcare profession should be available to ensure that every area in the hospital has sufficient amount of people to do their task without increasing the load of other that could lead to presure and tiredness when concentrating in the work[17].

Patients Role to Overcome Medication Error

1. Make a medication list, this list is to ensure all the medications taken are on time and it's easy to give the physicians for further treatment plan.
2. Together with this list also patient can write down the instruction of the medication in the way that they could understand to avoid complications when administering the drug.
3. Patients should be actively involved in the medication plan to make sure that the patient is aware of the medication taken and the use of the medication. By this they can know the things that they should avoid when the on the medication to give a better outcome to the patient.
4. Patients should ask question to the prescriber for a better understanding of the drug and the treatment plan. Example of a questions patient should ask the doctor while the treatment is planned.

- What is the medication's name and what is it supposed to do?
- How often and how long should I take the medication?
- Are there potential side effects? Which side effects should I report?
- Should the medication be taken until it's finished or just until I feel better?
- Should I avoid particular foods, beverages, medicines or activities while taking this medication?
- Is a generic equivalent available and appropriate?

5. Don't take any other persons medication because the dose might be different based on the size of the body. As the dose can be different so patients have to avoid this. Patient should also avoid taking expired medication as it could also cause problem.

Example of Case Study Due to Medication Error

A 42 year old guy was prescibed with warfarin. The reason why warfarin is prescibed is for the stroke problem in asssociated with atrial fibrilation. The patient has been taking the medication everyday for certain period then he develops skin infection. Once the patient has visited the hospital he was diagnosed with cellulitis. For the cellulitis problem the patient was prescribed with sulfamethoxazole to be taken. Several days later the patient has a elevated International Normalized Ratio (INR)

RESULTS AND DISCUSSION

Warfarin is a drug that is used to treat storke, this is drug is used for anticoagulant and artrial fibrilation. This drug has many complication, with food, with other drugs and with the lifestyle.

Patient consuming warfarin should always mention to the physicians about the medications. This is to ensure that physicians are aware and will know how to handle the case and how to plan the treatment for the patient. Its also advisable to patients to always bring the INR record to show to doctors or pharmacist. The person who is prescribing the medication should have adequate amount of knowledge on the drug before it is dispensed to the patient. A patient receiving the Warfarin medication should be advised on the importance and all safety measures of the drug to be actively participating in the treatment plan to avoid any problems.

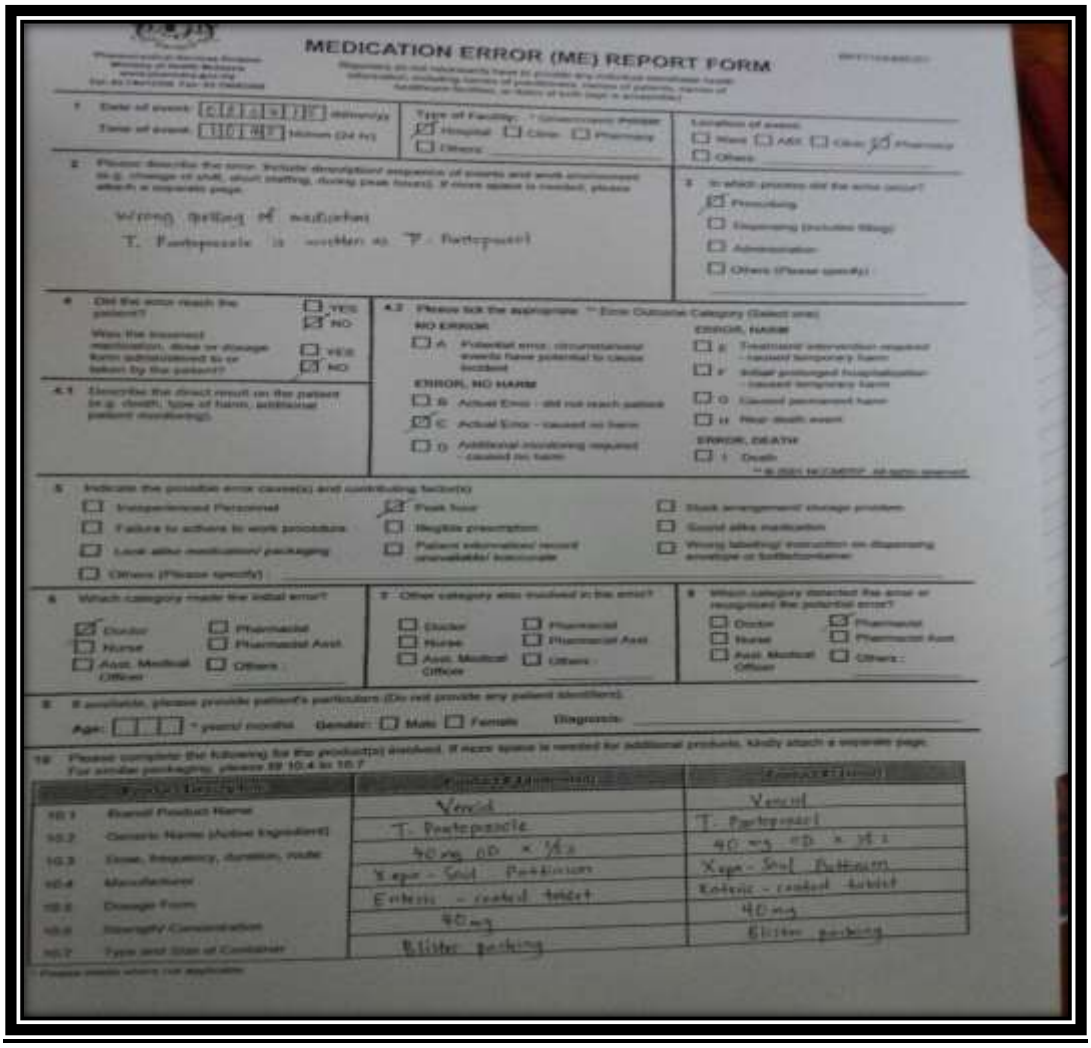

Figure 5: Example of Medication Error Report Form to Overcome Medication Error

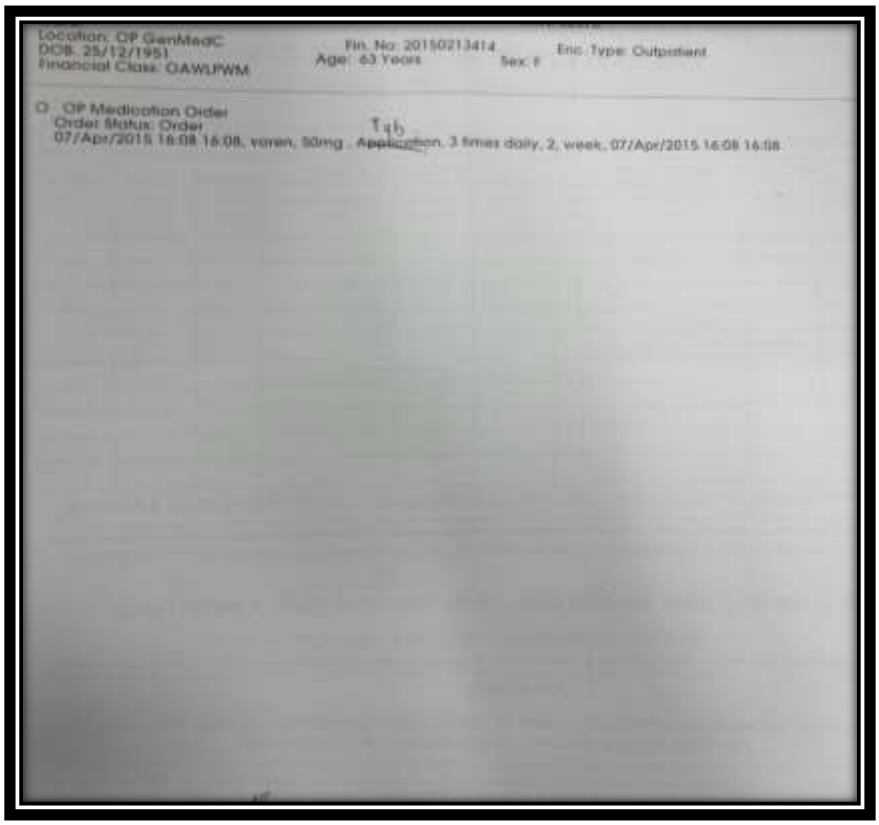

Figure 6: Example of Prescription with Error

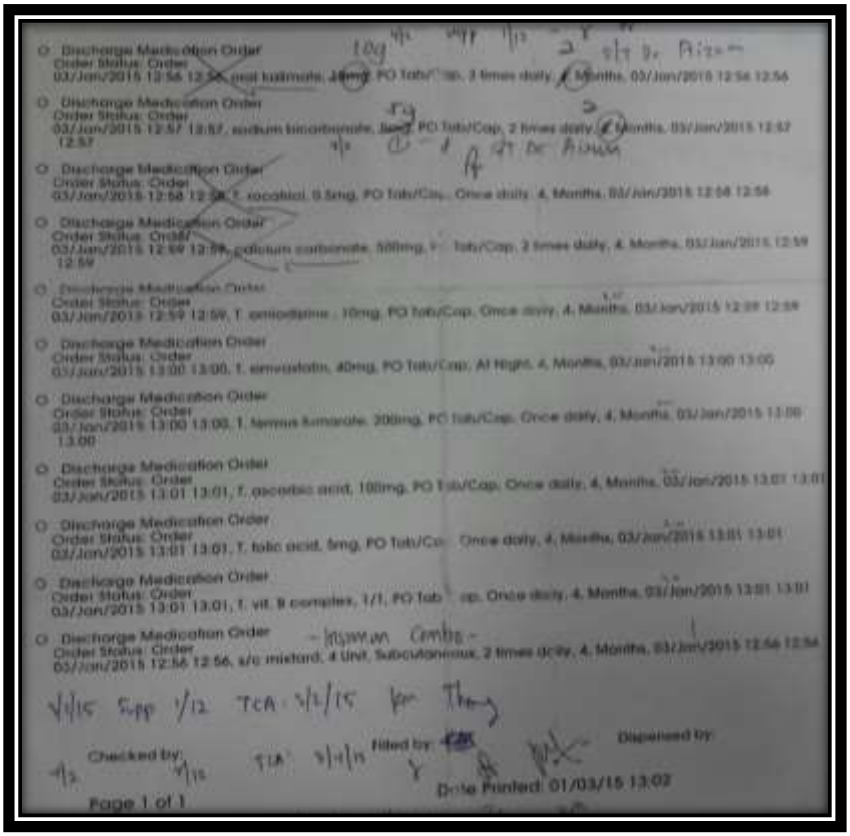

Figure 7: Example of Discharge Prescription with Error

CONCLUSION

Medication error is something that every healthcare professionals and patient should take into consideration, as this is one of the most common problems that we all face in the healthcare field. Physicians, pharmacist, nurses have to practice more the measures to overcome and to avoid medication error.

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