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## Review Article

### Prescription Errors in Psychiatry

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**ABSTRACT:** Prescribing errors are common in mental health settings and a significant number of these errors may result in a serious outcome. In the majority of cases, simple steps such as reduced junior doctor workload, improved training in psychopharmacology and more direct supervision of prescribing may have prevented the error. These are systems problems that are easy to detect, but difficult to address. The contribution of clinical pharmacists in detecting errors before they have a (sometimes serious) clinical impact should not be underestimated. Research on medication error in mental health care is limited. A review of the various studies done in relation to prescription errors is undertaken by us to understand this multifactorial and serious problem. Most of the research that is available is focused on secondary care; most studies have only included in patients and mainly relate to prescribing. All the studies are process based, rather than outcome based, and there has been no systematic study of causes of medication error in mental health care associated with deficits in knowledge or decision-making. The studies report few errors that result in actual serious harm to the patient. Hence, we decided to look at the various studies and attempt a comprehensive review of the topic. Adverse events involving psychotropic drugs are common and some may be due to errors in clinical decision making of a type not detected by the studies reviewed. These are potentially preventable. On the basis of this, it is recommended that medicine management in mental health settings should be a priority for future research.

**KEY WORDS:** *Prescription errors; Health care; Medication*

#### INTRODUCTION

In 1910, Richard Clark published the first study that looked at the error rates in clinical diagnosis<sup>1</sup>. The number of prescriptions written increases annually and the number and complexity of available drugs and drug combinations is steadily growing. These facts are just as relevant to psychiatry as to general medicine. Prescribing, like any high-volume, high-risk activity can go wrong and errors can have tragic consequences. While fatal errors usually involve parental drugs such as potassium chloride, cytotoxics or drugs used during anaesthesia<sup>2</sup>, many psychotropic drugs have the potential to cause significant morbidity and mortality if used wrongly. In addition, psychiatrists

can find themselves prescribing out of their area of expertise when patients with physical illnesses are admitted to psychiatric beds.<sup>3</sup> Information on this important area is limited and at best sketchy. In order to have a comprehensive understanding of this important domain of medicine we reviewed the available literature. There have been only very few studies that focus on prescribing errors in psychiatry. Although some of these adverse reactions to drugs are not preventable, many are, and hence should be analysed in detail as they would be categorised as being due to medication error.<sup>3</sup>

Medication errors became front-page news with the November 1999 release of a compelling report from the Institute of Medicine (IOM). The public may have been surprised to learn that errors involving prescription medications kill up to 7,000 Americans a year, according to the IOM, and that the financial costs of drug-related morbidity and mortality may run nearly \$77 billion per year.<sup>4</sup> It

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has been estimated that up to 2% of hospitalised medical patients in the United States might be harmed as a result of a drug error, most of which are prescribing errors. One-fifth of clinical negligence claims originating from hospitals in the UK involve medication errors. It has been estimated that, in the UK, adverse reactions to drugs cause 1 in 16 hospital admissions and 10 000 deaths each year.

Broadly speaking, medication errors are classified according to the stage of the process at which the error occurs or by some inference about the cause of the error. An example of the former is the subdivision into errors of prescribing, transcription, dispensing, monitoring and administration.<sup>5</sup>

Classifications that infer a cause generally distinguish between errors due to inadequate knowledge, skills or decision making, those due to failure to execute a plan because of slips or lapses, and those due to a conscious violation of the rules of correct behaviour. The incidence and cause of medication error have perhaps been studied most extensively in hospital wards. A recent review of this research concluded that it harmed 1-2% of admitted patients and that prescribing error is the most common type of medication error in this settings.<sup>6-7</sup>

Prescribing errors are a daily occurrence in Mental Health Trusts. Approximately 10% of errors are potentially serious and Mental Health Trusts can expect at least one error of this type to occur every week. Pharmacists are known to report less than a third of prescribing interventions that they make<sup>8</sup>, so the actual number of errors might be much higher. Researches show that medication error in mental health care is a neglected aspect of research. In particular, there have been no systematic studies of patients living in the community. Therefore, the potential for mental health services to prevent harm and deaths from medication error is unknown. Consistent with this, the issue is not high on the mental health policy agenda.<sup>3</sup>

Studies show that psychotropic drugs cause substantial harm and suggest that mental health services might have greater potential to prevent deaths from adverse drug events than to prevent deaths from suicide and homicide. For example, the largest English study of its type estimated that adverse drug events caused 6.5% of all admissions and might account for about 6000 deaths each year. Antidepressants were implicated in 7% of these admissions. The proportions of admissions due to psychotropic medications would certainly be higher if admissions because of intentional overdoses are included.<sup>3</sup>

### Medication Errors

- Prescription errors – 39 %
- Transcribing errors – 11 %

- Dispensing errors – 12 %
- Administering errors – 38 %

### Types of Prescription Errors

The medication prescribing process includes various components. Errors may occur in any one of these elements, including: written orders, medication ordering systems, dosage calculations, verbal orders, and electronic order transmission.<sup>9</sup>

A quarter of the errors detected were 'clerical' in nature. These may be due to pressure of work, lack of familiarity with the system or the patient, or simple carelessness. This group of errors consisted mostly of transcription errors and incomplete or ambiguous prescriptions. Such errors can be potentially serious. Examples included omitting lithium from a new medicine card (abrupt discontinuation is associated with a high risk of relapse into mania) and failure to make a decimal point clear (a frail elderly patient was given 5mg risperidone when 0.5mg was intended). It has been suggested that doctors see rewriting medicine cards as a routine task that requires less attention than primary prescribing. This perception must be challenged.<sup>3</sup>

Almost 60% of errors were 'clinical' in nature. This is consistent with studies of prescribing errors in medicine as a whole<sup>10</sup>. These errors originate from a lack of understanding of what is being prescribed, what the correct dose should be, how the drug works and the drug interactions that might be anticipated. Research in general medicine has shown that the consultant often instructs the junior doctor to 'put the patient on...', 'increase the dose a bit...', 'titrate against response...' etc. and the junior doctor does not have the expertise to interpret or time to fully think through every instruction. Clinical errors when prescribing psychiatric drugs were found to be just as likely as when prescribing drugs for physical illness. These errors could possibly be minimised if consultants gave more explicit instructions to their junior doctors, directly looked at medicine cards more often and covered the practicalities of prescribing during clinical supervision.<sup>3</sup>

Monitoring errors are also common, particularly prescribing clozapine in the absence of satisfactory blood results (or any plan to obtain them) and prescribing drugs on an 'as needed' basis for long periods of time without any review of continuing need. The original indication might have resolved and the drug still be administered for a completely different purpose. One study found that nurses administered anticholinergic drugs on an 'as needed' basis for a wide range of indications, including blurred vision and repetitive chewing movements.

When prescribing errors were detected, the prescriber was contacted directly in less than two-

thirds of cases. Although resolving the problem without contacting the prescriber may be justified as 'not bothering the doctor'<sup>10</sup>, it was found that most junior doctors welcomed feedback on their prescribing and considered it to be an important part of their development. Leaving notes on medicine cards might communicate the action required without the rationale being obvious, thus wasting a learning opportunity<sup>10</sup>. It was found that increasing the number of clinical pharmacists in a hospital from the 10th percentile to the 90th percentile reduced medication errors by almost 300%. The greatest impact was made by their involvement in developing prescribing protocols, providing a drug information service, and by their participation in ward rounds and adverse drug reaction management<sup>11</sup>.

**Written Medication Errors - Illegible Handwriting<sup>12-14</sup>**

The written medication order is the first place in which a prescribing error may occur. For example, As a result of poor handwriting, written orders require extra time to interpret. Sixteen percent of physicians have illegible handwriting. Worse, illegible handwriting on medication orders is a common cause of prescribing errors, and patient injury and death have resulted. There may also be legal ramifications to illegible handwriting. According to a 1997 American Medical Association report, medication errors related to misinterpreted physicians' prescriptions were the second most prevalent and expensive claim listed on malpractice cases filed over a 7-year period. Illegible orders may also lead to delays in the administration of medications. In order to clarify these illegible orders, the health care practitioner's workflow is typically interrupted (**Figure 1 & 2**).

दिनांक (Date)	संक्षिप्त परीक्षण विवरण (Clinical Examination & Investigations)	उपचार (Treatment)
35 28/12/10	<del>HE-TC HIV TUB</del>	<p>BT m</p> <ul style="list-style-type: none"> <li>• G Meil-Li</li> <li>• G Methyl</li> <li>• G Transderm</li> <li>• G Nip</li> <li>• G Methyl (ke)</li> <li>• G Methyl (ke)</li> <li>• G Methyl (ke)</li> <li>• G Methyl (ke)</li> </ul>

**Figure 1: Illegible prescription**

फॉलोअप (Follow up)

दिनांक (Date)	संक्षिप्त परीक्षण विवरण (Clinical Examination & Investigations)	उपचार (Treatment)
169 31/5/10	<del>HE-TC HIV</del>	<ul style="list-style-type: none"> <li>• G Esalun</li> <li>• G Argen</li> <li>• G Methyl</li> </ul>

**Figure 2: Illegible prescription**

### ***Inadequate History***

Inadequate knowledge, availability, or appreciation of important patient-specific information is a common cause of medication prescribing errors. Prescribers must consider the above patient-specific data when ordering medications. A complete patient history should include age, weight, renal and hepatic function, concurrent disease states, laboratory test results, concurrent medications (i.e., prescription, over-the-counter, vitamin/mineral supplements, and alternative medicines), allergies, medical/surgical/ family history, and pregnancy/lactation status in women<sup>15</sup>.

### ***Clarity of Orders***

Prescribers should communicate pertinent patient-specific information with written medication orders. This will, in turn, allow other health care professionals to assess the medication order's appropriateness in case something has been overlooked by the prescriber. For example, it is important for a pharmacist to be aware of renal or hepatic disease when assessing the prescription. In this way the pharmacist can call potential problems to the attention of the physician if there are any questions about proper dose of a drug that is excreted by the kidney or metabolized in the liver, especially if the potential for toxicity exists. Unfortunately, patients are often unable to communicate accurate information to their pharmacist about their condition<sup>15</sup>.

### ***Dosage Calculations***

Dosage calculations are a known cause of medication errors. Patient-specific information, (i.e. height, weight, age, and body system function) should be used to calculate dosages when the medication is influenced by those factors. Two solutions may help prevent dosage calculation errors: (1) avoiding calculations and (2) routine cross-checking. Calculations can be avoided through the standardization of drug concentrations and the use of commercially prepared dosage forms. Cross-checking is of the utmost importance when calculating dosages for paediatric, geriatric, cancer, and critical care patients.

Verbal orders should be avoided whenever possible by delaying orders when possible or using a fax machine or electronic communication. When a verbal order is necessary, it should be enunciated slowly and distinctly. Numbers should be stated in the way pilots state them (i.e., "one-five mg" instead of "fifteen mg") Difficult drug names should be spelled out. For example, an order for "NPH insulin 16 units" can easily sound like "NPH insulin 60 units." "Read back" is an important way

to prevent errors due to misinterpretation of verbal orders<sup>16</sup>.

### ***Communication Difficulties in Mental Health Services***

Problems of communication cause more than two thirds of treatment errors in medical practice, and errors are likely when information is transferred across organisational boundaries. In one study, potentially harmful medication errors occurred in 24% of psychiatric admissions and in 18% of discharges. In particular, secondary care records tend to omit non-psychotropic drugs. Junior doctors may take incomplete or inaccurate histories of medication on admission, partly because of reliance on a single source of information such as the general practitioner's letter. Primary care records may omit psychotropics, including medicines supplied by mental health services, such as clozapine, depot injections and cholinesterase inhibitors.<sup>5</sup>

### ***Using SOS Medications***

A significant number of errors occur in the frequent use of medication prescribed to be given "as required" at the discretion of nursing staff in mental health inpatient units. One study found that the quality of prescribing as required medication was considerably poorer than that of regular medication. The potential risk is illustrated by a census of in patients prescribed antipsychotics, which found that "as required" medication sometimes gave nurses the option of giving doses above the recommended range.<sup>4</sup>

### ***Decision Making Errors***

Decision-making errors in mental health care psychiatrists often fail to screen adequately for the adverse effects of psychotropic drugs. This includes screening for the metabolic syndrome for patients prescribed atypical anti-psychotics and for adverse effects and toxicity in patients prescribed lithium. This may result in modifiable factors for premature death being untreated. Research on the cause of these failures to monitor for adverse drug reactions might modify the design of training interventions to deal with deficits in knowledge and systems that reduce the frequency of slips and lapses<sup>4,5</sup>.

### ***Off-Label Use of Drugs***

The problem of medication error related to inadequate prevention and management of adverse effects might be compounded by the frequency with which psychiatrists prescribe outside the product licence. Although such "off-label"

prescribing may sometimes be appropriate, it may increase the risk of harm through inadequate monitoring. For example, safety alerts concerning drugs not licensed for psychiatric conditions, such as anticonvulsants prescribed as mood stabilisers, may not be directed to psychiatrists. Another example is the off-label prescribing of high-dose antipsychotics. This is associated with a higher incidence of adverse reactions to drugs, and requires close monitoring. There is evidence that this often does not happen.<sup>3</sup>

### **Poorly Developed Prescribing Systems and Pharmacy Services**

Many mental health services have poorly developed systems to aid communication and support safe medicine management. There is also a lack of standardisation so that clinicians who move between services are confronted with unfamiliar systems for prescribing, obtaining, handling and administering medication. Many inpatient units and community mental health teams have limited electronic infrastructure, unintegrated, paper-based record systems, little decision support for prescribing and poor access to laboratories for monitoring<sup>17</sup>. Pharmacists are effective at detecting and preventing some serious prescribing errors<sup>18</sup>. In mental health services, the problems caused by poor prescribing systems are compounded by the inadequate staffing and organisation of pharmacy services. Some mental health services have limited pharmacy infrastructure and so have limited awareness of, or strategic capacity to improve, medication management. Poor staffing levels, inadequate training, lack of appropriate clinical expertise and lone working without adequate clinical supervision are features of the service<sup>18,19</sup>. In many mental health trusts, pharmacy services are contracted in from acute care providers through service-level agreements. This can compound problems as staffs are employed by another organisation whose systems of working may not prioritise mental health<sup>18</sup>.

### **Confusing Brand Names<sup>20</sup>**

Practitioners and pharmacists often report confusion between look-alike and sound-alike brand names, between similar generic names, and between similar brand and generic names. To add to this, doctors' illegible handwriting, incomplete knowledge of drug names, newly available products, and similar packing and labelling of drugs marketed by the same company contribute largely to wrong prescribing and dispensing. Various recommendations have come forth to do away with this problem:

- Licensing authorities and regulatory agencies should exercise more control over the naming of a new formulation.
- Non-proprietary and new proprietary names should be internationalised.
- Pharmaceutical regulatory processes should be streamlined and improved.
- Over the counter (OTC) drugs should be given unique names.
- Non-proprietary names should be used as far as possible in prescriptions.
- Regulatory authorities should be willing to change the names if cross occurs.
- There should be good communication among those who prescribe, supply and administer medicines and those who take them.

Most of these recommendations are quite far-fetched and remote and may take time before they are actually put into practice<sup>19</sup>. Therefore, considering the Indian scene, the few steps that can be taken are:

- The practitioner: Doctors should be well-versed with pharmacological (generic) names and the brand names that are available in their local setting.
- The dispenser/pharmacist: The pharmacists should be wholly convinced about the nature of the brand they are dispensing. If there is any doubt about the name, they should not hesitate to consult the prescribing doctor before dispensing.
- The patient: Must get the medications checked before using them
- The manufacturer: The companies must also join hands in this venture to avoid giving a confusing name to a new product<sup>19</sup>.

### **Summary**

In summary, the common causes for error are:<sup>18</sup>

- Wrong patient
- Contra-indicated medicine
- Wrong drug / ingredient
- Wrong dose / frequency
- Wrong formulation
- Wrong route of administration
- Poor handwriting on prescriptions
- Incorrect parental administration calculations or pump rates
- Poor record keeping
- Paediatric doses
- Poor administration techniques

Most common types of medication errors reported have been graphically presented (**Figure 3**).

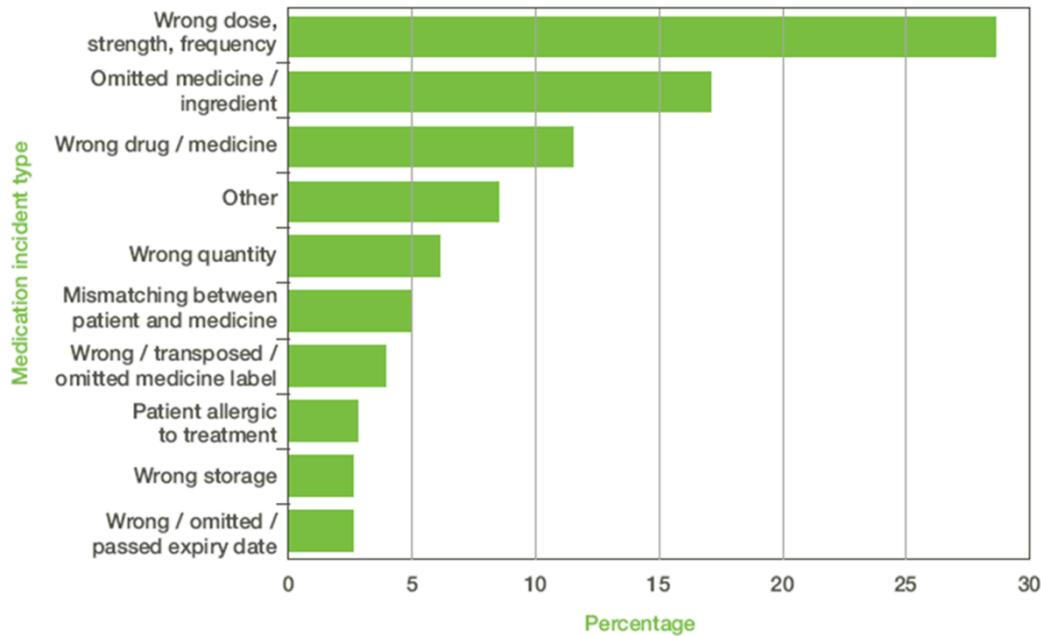


Figure 3: Common types of prescription errors (source: National Patient Safety Agency)<sup>15</sup>

**Commonest cause of medical errors<sup>18,21</sup>**

- Lack of knowledge of the drug – 29%
- Lack of knowledge about the patient – 18%
- “Rule” violations – 10%
- “Slip” or memory loss – 9%

**Steps For Avoiding Prescription Errors<sup>16,18,19</sup>**

**1. Understanding Prescribing Responsibilities**

- Drug
- Dose
- Route
- Frequency
- For parental therapy
  - Diluents and infusion volume
  - Access line for administration

- Rate of administration
- Duration of treatment
- Allergies and sensitivities

**2. Provide a Prescription that is**

- Legible (Fig I and II)
- Legal
- Signed
- Giving all information to allow safe administration

**3. For Controlled Drugs**

Following need to be included:

- Name and address of patient
- Drug and dose
- Form and strength of the drug
- Modified release
- Strength if liquids/injections

- Total quantity (or number of dosage units) in words and figures

**4. Safe Prescribing**

- Clear and unambiguous
- Use approved names / deal cautiously with drug names
- No abbreviations e.g. ISMN
- Unless G or mg then write units in full (micrograms or nanograms)
- Avoid decimal points – if needed then make very clear: .5ml X 0.5ml ✓
- Avoid a trailing zero: 1.0mg X 1mg ✓
- Avoid fractions: 0.5mg X 500 µgm ✓
- Rewrite charts regularly
- If amending prescription, re-write or sign and date the amendment
- For frequency use standard abbreviations e.g. od/bd/tds, etc
- If using a dose by weight calculate the dose needed (Not 1.5mg/kg)
- Take time (e.g. to read patient information)
- Use your resources. Computers can also play a major role in ameliorating handwriting problems.
- Communicate with the patient, pharmacist and nurse clearly, in written and verbal if needed.
- When in doubt - enquire

**Policies for Preventing Medical Error<sup>18,19</sup>**

**Use of Practice Guidelines**

Practice guidelines have been developed by the APA for a variety of disorders. These include delirium, dementia, substance use disorder,

depressive disorder, panic disorder, borderline personality disorder, suicide, and schizophrenia. There is no indication that there has been an increase in malpractice suits against psychiatrists since their introduction; however, published guidelines are often brought forward in litigation as standards of care. Psychiatrists and other physicians should not be intimidated by this practice. Psychiatrists may legally and ethically deviate from guidelines; however, the decision to do so and its rationale should be documented in the chart.<sup>19</sup>

### **Regulating Working Hours of Interns and Residents**

The errors by junior doctors are very significant in proportion. But then American teaching hospitals often rely on interns and residents to perform services such as phlebotomies and intravenous (IV) therapy and to serve as messengers and transporters, tasks that are more appropriately performed by ancillary personnel. In addition, house staff is often required to work long hours, and sleep deprivation can impair their judgment and clinical skills. The average resident works more than 80 hours per week, with a shift of 30 hours every third or fourth night. Because of this, in 1988, a limit on the number of hours interns and residents may work was set forth by the US Health Care Financing Administration (HCFA), now officially known as the Centre for Medicare and Medicaid Services (CMS). Their work rules are (1) residents are limited to no more than 12 consecutive hours per assignment in emergency services, (2) residents may not work more than 80 hours per week over a 4-week period and cannot be scheduled to work more than 24 consecutive hours, and (3) scheduled rotations must be separated by not less than 8 hours of nonworking time, provided for each week. Nonworking time is time away from training and patient care activities.

Emergency physicians commonly experience sleep deprivation because of the need to work shifts during evening and late night hours. The negative effects of this problem are compounded by job stress and traditional methods of scheduling work shifts. Sleep deprivation may be reduced by schedules designed to lessen interference with normal sleep patterns and circadian rhythms. Pharmacological treatments for sleep deprivation exist in the form of alertness-enhancing agents such as caffeine and modafinil. Sleep-promoting agents may also help treat the problem by helping physicians to sleep during daytime hours. Minimizing sleep deprivation may help prevent job burnout and prolong the length of an emergency physician's career<sup>19</sup>.

### **Coping with Medical Errors and Adverse Events**

Doctors have a long tradition of examining adverse events and of learning from their mistakes. The case presentation (also called the clinical pathologic conference [CPC]) is a group exercise attended by clinicians, researchers, educators, and students who examine all aspects of patient diagnosis, treatment, and outcome. Ideally, CPCs do not attempt to cast blame on a practitioner; however, if negligence has occurred, then it becomes evident in the open discussion of those in attendance.<sup>19</sup>

### **Ethics of Disclosure<sup>21</sup>**

There is an ethical duty on physicians to disclose medical errors, accidents, injury, or bad results to their patients who have an absolute right to understand what occurred during their course of treatment. An explanation is mandatory, and an apology is appropriate if an error was made. If, as a result of disclosure, legal proceedings ensue, then the physician has the opportunity to offer an explanation—but appropriate compensation for harm suffered as a result of malpractice is a patient's legal right<sup>21</sup>.

### **Patient–Doctor Relationship**

A good patient–doctor relationship is characterized by a sense of trust, respect, and honesty between the two parties. A better patient–doctor relationship, leads to less chance of misunderstanding leading to litigation. Studies have shown that, when a medical error or adverse event occurs within the context of a good patient–doctor relationship, litigation is rare. In its absence, however, litigation is likely in as much as 70 % of cases of medical error, especially if a major mistake was made, regardless of whether or not death ensues. In surveys of patients, almost 100 % desire that doctor's report and discuss medical errors with them. Acknowledging medical error, minor or major, may actually reduce the risk of malpractice action<sup>19</sup>.

### **Therapeutic Privilege**

Therapeutic privilege is the physician's right to withhold information from a patient, if, in his or her opinion, such disclosure would cause irreparable harm to the patient. Some patients do not wish to know the nature of their illness and that right needs to be respected. Others may be so prone to anxiety or panic that even a hint of medical error (especially if no adverse outcome occurred) would be potentially dangerous to the patient's overall sense of well-being<sup>21</sup>.

### Duty to Disclose

There is a patient–consumer movement supported by some members of the legal profession that would require physicians by law to report medical errors. As mentioned previously, disclosure is currently an ethical, not a legal, obligation. Opponents of the duty to disclose law argue that it would harm the patient–doctor relationship and, in particular, weaken the trust and team work among health care professionals who would be required to be informants on one another. Adopting a rule of disclosure also suggests to the public that doctors, as a group, are not to be trusted. Opponents of the law also note that quality assurance and risk management programs that bring negligent acts to light are already in place and that further enforcement is unnecessary. Most experts take the position that physicians are the ones who ultimately must decide to disclose errors based on their professional and ethical beliefs<sup>21</sup>.

### Role of Apology

It is becoming standard practice for physicians to apologize to patients when disclosing unanticipated outcomes that fall within the category of medical error. For an apology to be successful, however, there must be a real sense of regret communicated to the patient or family. It is not sufficient to say “I am sorry”. There must be an empathic communication of concern and personal responsibility. Apologies have generally not been admitted in evidence in malpractice suits because it would have a chilling effect on the entire process. Juries could interpret an apology as admission of guilt and be less objective about facts in the case that might otherwise be exculpatory<sup>21</sup>.

Few Recommendations from the WHO Guide for Good Prescribing.<sup>19</sup>

1. Evaluate and Clearly Define the Patient's Problem
2. Specify the Therapeutic Objective
3. Select the Appropriate Drug Therapy
4. Initiate Therapy with Appropriate Details and Consider Non pharmacologic Therapies
5. Give Information, Instructions, and Warnings
6. Evaluate Therapy Regularly
7. Consider Drug Cost When Prescribing
8. Use Computers and Other Tools to Reduce Prescribing Errors<sup>17</sup>

### An Important Indian Study

In a study, Patel, Naik and Vaidya found<sup>22</sup> that information to identify the practitioner was incomplete in more than a third of the prescriptions and information to identify the patient was incomplete in more than half. Clarity of written instructions on how to take the medicines was

unsatisfactory in the majority of prescriptions. Polypharmacy was the norm, with more than half (52.7%) the prescriptions containing at least 3 medicines. Forty per cent of prescriptions included a vitamin or tonic preparation and a quarter of the prescriptions included an antibiotic and an analgesic. Over 90% of prescriptions contained only branded medicines. Private practitioners prescribed significantly greater number of medicines and were more likely to prescribe vitamins and antibiotics, and branded medicines. They concluded that the quality of prescriptions, both in terms of layout and the content of the drugs prescribed, was inadequate. They reported that there is a need to standardize the format of prescriptions in India so that all essential information is included and to strengthen an independent mechanism for continuing professional development of practitioners to ensure that patients are always given evidence-based, cost-effective treatments.<sup>22</sup>

### Conclusions

In conclusion, prescribing errors are common in mental health settings and a significant number of these errors may result in a serious outcome. In the majority of cases, simple steps such as reduced junior doctor workload, improved training in psychopharmacology and more direct supervision of prescribing may have prevented the error occurring. These are systems problems that are easy to detect, but difficult to address. The contribution of clinical pharmacists to detecting errors before they have a (sometimes serious) clinical impact should not be underestimated. Research on medication error in mental healthcare is limited. The research is focused on secondary care; most studies have only included in patients and mainly relate to prescribing. All the studies are process based, rather than outcome based, and there has been no systematic study of causes of medication error in mental health care associated with deficits in knowledge or decision making. The studies report few errors that result in actual do serious harm to the patient. However, this might be owing to the limited focus of the research. Adverse events involving psychotropic drugs are common and some may be due to errors in clinical decision making of a type not detected by the studies reviewed. These are potentially preventable. On the basis of this, it is recommended that medicine management in mental health settings should be a priority for future research, with a particular emphasis on non-hospital settings.

### REFERENCES

1. Gore DC, Gregory SR. Historical perspective on medical errors: Richard Cabot and the

- Institute of Medicine. *J Am Coll Surg.* 2003;197(4):609-11.
2. Ferner RE. Medication errors that have led to manslaughter charges. *BMJ.* 2000(7270);321:1212-6.
3. Paton C, Gill-Banham S. Prescribing errors in psychiatry. *Psychiatric Bulletin.* 2003;27:208-10.
4. The Institute of Medicine. To err is human: building a safer health system Kohn LT, Corrigan JM, Donaldson MS (Ed) National Academy Press, 2101 Constitution Avenue, N.W., Box 285, Washington, DC.
5. Maidment ID, Lelliott P, Paton C. Medication errors in mental healthcare: a systematic review. *Qual Saf Health Care.* 2006;15(6):409-13.
6. Dean B, Schachter M, Vincent C, et al. Causes of prescribing errors in hospital inpatients: a prospective study. *Lancet.* 2002;359(9315):1373-8.
7. Franklin B, Barber N, Schachter M. What is a prescribing error? *Qual Saf Health Care.* 2000;9:232-7.
8. Boardman H, Fitzpatrick R. Self reported clinical pharmacist interventions underestimate their input to patient care. *Pharm World Sci.* 2001;23(2):55-9.
9. Jones DR. Errors on doctors' prescriptions. *J R Coll of Gen Pract.* 1978;28(194):543-5.
10. ASHP guidelines on preventing medication errors in hospitals. *Am J Hosp Pharm.* 1993;50(2):305-14.
11. A study of physician's handwriting as a time waster. *JAMA.* 1979;242(22):2429-30.
12. Brodell RT, Helms SE, KrishnaRao I, et al. Prescription errors. Legibility and drug name confusion. *Arch Fam Med.* 1997;6(3):296-8.
13. Cabral JD. Poor physician penmanship. *JAMA.* 1997;278(13):1116-7.
14. Cohen MR. Medication Errors: Causes, Prevention, and Risk Management. American: Pharmaceutical. Association. Jones & Bartlett Publishers; 2000:8.1-8.23
15. Seven steps to patient safety: An overview guide for NHS staff. 2nd Print; 2004.
16. Kaushal R, Kern LM, Barrón Y, et al. Electronic prescribing improves medication safety in community-based office practices. *J Gen Intern Med.* 2010;25 (6):530-6.
17. Aspden P, Wolcott JA, Bootman JL, Cronenwatt LR. Institute of Medicine Committee on Identifying and Preventing Medical Errors. Preventing Medical Errors. Washington, DC: National Academies Press 2007.
18. World Health Organization's (WHO) Guide to Good Prescribing.
19. Rataboli PV, Garg A. Confusing brand names: nightmares of medical profession. *J Postgrad Med.* 2006;51(1):13-6.
20. Neville RG, Robertson F, Livingstone S, et al. A classification of prescription errors. *J R Coll Gen Pract.* 1989;39(320):110-2.
21. Calvert JF Jr, Hollander-Rodriguez J, Atlas M, Johnson KE. Clinical Inquiries. What are the repercussions of disclosing a medical error? *J Fam Pract.* 2008;57(2):124.
22. Patel V, Vaidya R, Naik D, et al. Irrational drug use in India: a prescription survey from Goa. *J Postgrad Med.* 2005;51(1):9-12.