
Good Prescribing Manual For Ethiopia

Drug Administration and Control Authority of Ethiopia

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Preface

This first good prescribing manual is prepared to promote the rational use drugs in Ethiopia. It comprises of an introductory part, objectives of the manual, 5 chapters and 6 sections.

The introduction deals with some of the positive trends and deficiencies observed over time in the prescribing practice in Ethiopia. These were based on review of relevant local literature.

Chapter 1 deals with what is generally perceived as components of a good prescribing practice.

Chapter 2 introduces the important concept of P-(personal) treatment, and P- (personal) drug.

Chapter 3 presents guidelines for selection of P-drugs.

Chapter 4, which comprises the major portion of the manual, the use of P-drugs in the treatment of individual patients is illustrated using relevant examples.

The last chapter, (chapter 5) deals with need and resources for updating drug related information. References are given at the end of the document.

Chapter 1

Introduction

Drugs are an essential component of health care delivery. When used rationally, they produce the desired effect of improving patients ailments. Their irrational use on the hand leads to prolongation of the illness, development of adverse effects, and unnecessary expense.

Irrational drug use pertains to the use of drugs when they are not needed. It also means prescribing drugs with out adequate scrutiny regarding their efficacy, safety, affordability, and suitability to the patient.

Many countries are doing their best to curb the problem of irrational drug use by developing national programs that promote appropriate prescribing behavior. In countries like Uganda, the Sudan and Zimbabwe such national programs were shown to positively influence the drug use pattern (1-3).

In Ethiopia, several efforts have been made to promote the rational use of drugs. Among these, the publication of Essential and National Drug List for Ethiopia, and the recent introduction of the Standard Treatment Guidelines (STG) are the most notable. As a result of such relentless efforts, some positive trends in the prescribing practice have been observed over time.

For instance, a survey of 115 health professionals (doctors, health officers, pharmacists, nurses and druggists) working in 12 health institutions in Addis Ababa, regarding their “Knowledge and application of national and essential drug lists”, documented the following findings (4); Of the 115 respondents, 89 (77.4%) defined national and essential drug lists correctly and 103 (89.6%) expressed that the essential and national drug lists helped them to avoid unnecessary use of brand drugs. The importance of this study is, that publication of important documents like the LIDE, or STG, is not an end by itself. It can only be useful when the concerned health professionals have adequate knowledge about it and are committed to its application.

Another study that looked in to; “Patterns of drug utilization in Addis Ababa over a seven year interval (1989 to 1995)”, produced a result that showed a highly significant shift towards generic prescribing; from 40% of all prescribed drugs in 1989, to 62% in 1995. (5)

Data from a study done in Jimma hospital on prescription pattern also demonstrated that 95% of the drugs prescribed were those in the essential drugs list, and 75% of the prescriptions were for generic drugs. (6)

The use of International Non Proprietary Names (INN) or generic names of drugs in prescribing is an essential component of good prescribing practice. This is

because generic drugs are less costly, an important factor in our country, and for a generic prescription any suitable product can be dispensed hence avoiding delay while looking for a specific brand.

In the above cited studies in addition to this encouraging trend of generic prescribing, a low average number of drugs and low cost per prescription were among the positive trends noted.

Although the commendable efforts of the Drug Administration and Control Authority and relevant professional schools and associations, have produced some good results, there are indications that the rational use of drugs in Ethiopia is far from satisfactory.

Results from the following studies illustrate some of the common problems of irrational drug use in Ethiopia.

A baseline survey conducted in 8 hospitals in southern Ethiopia, looked in to the prescription pattern and factors that influence prescribing behavior. (7) This study concluded that irrational prescribing (in the form of high average number of drugs per encounter, high percentage of injections, high percentage antibiotic prescribing) is highly prevalent in the studied region. It also noted that prescribing behavior in over 60% of the respondents, is influenced by factors like peer-norms, lack of drug information, work load, etc rather than sound scientific evidence. These factors were given as the cause of the observed irrational drug use.

It is well documented that antimicrobials and analgesics/antipyretics are the two most commonly prescribed groups of drugs in Ethiopia. We will look in to data regarding some commonly prescribed members of these two groups.

First, several studies have raised concern on the use of Dipyron, as a first line analgesic/antipyretic drug. Dipyron, which has been out of use in many countries because of its toxicity (agranulocytosis)(8) is still widely prescribed in some places. In one study it was the most commonly used analgesic/antipyretic, accounting for 34.2% of drugs used for same purpose; followed by, acetylsalicylic acid (aspirin) 28%, paracetamol 19.1% and avafortan (camylofin & dipyron) 17.7%.(9) In two other studies, the percentage of dipyron use was 12%&29%(6, 5)

Secondly, a study that looked in to the drug use pattern in paediatric wards of three Ethiopian hospitals revealed that chloramphenicol was either the most or the second most frequently used antimicrobial.(10) Although at times availability determines what is prescribed, the rationality of chloramphenicol ranking first or second while other choices like, ampicillin and cotrimoxazole were also available,

is questionable, because chloramphenicol is more toxic (aplastic anemia) than the others.

Adherence of patients to a treatment program is necessary for the success of the program. Non-adherence or non-compliance results from factors related to the drug, the patient, the prescriber and the environment. One important prescriber factor leading to non-compliance is not giving the patient adequate information regarding his illness or the importance, effect, and adverse effects of the treatment. Result of a study illustrated that great majority of our patients are not given such essential information. In this study, out of 200 patients from four hospitals in Addis Ababa, asked whether they were given information about their medications, only 5.5% were informed about drug-drug interaction, 7% About adverse effect of the drug, and only 9.5% were given information about contraindication of the drug they were given. (11)

The above cited examples probably show only the tip of the ice-berg regarding the problem of irrational prescribing. However, appraisal of such local data is essential in formulating remedial strategies.

Objectives of the Good Prescribing Manual

To help prescribers in Ethiopia to critically look into their current prescribing behavior.

Encourage rational prescribing that is based on sound scientific evidence, conforms to international standards and local guidelines.

Encourage all prescribers to develop a list of P-drugs (Personal drugs) so that they will have a thorough knowledge of the effects, adverse effects, drug-drug interactions, and contraindications of the limited drugs in their P-drug lists.

Motivate prescribers to develop and maintain a behavior of regularly updating drug information through all possible means

Chapter 2

PRINCIPLES OF RATIONAL PRESCRIBING

Good Prescribing Practice (GPP) is prescribing the right drug at the right time, in the right dosage of the right formulation and for the right length of time. GPP also includes not prescribing any drug at all if no need. It requires detailed knowledge of the pathophysiology of the disease and clinical pharmacology of the drug.

1.1. Requirements for Good Prescribing Practice includes;

1. One needs to assess the benefit-to-risk ratio of prescribing by considering:
 - a. seriousness of the problem to be treated
 - b. efficacy of the drug to be used
 - c. severity and incidence of possible ADRs
 - d. safety and efficacy of alternative drugs if any
 - i. e.g., phenylbutazone, commonly used in the treatment of osteoarthritis in the past, because of its high benefit-to-risk ratio, is currently replaced with safer drugs.
 - e. Assessment of benefit-to-risk ratio may not always be easy. The following examples show this problem:
 - i. the benefit of adding digoxin to a diuretic and vasodilator vis-à-vis the risk of its toxicity in the treatment of congestive cardiac failure. This might depend on the cause of the heart failure, patient compliance, renal function and ease of monitoring of plasma digoxin concentration
 - ii. the benefit from a course of antibiotic in treating urinary tract infection in two months pregnant as compared to the risk of treatment to the fetus. Here the risk of teratogenesis needs to be compared to the risk of renal damage to the mother as a result of untreated infection
2. Justification for drug therapy
 - a. One has to justify the following before prescribing:
 - i. the need for treatment
 - ii. potential benefit likely to be greater than the risk
 1. Examples of unjustified prescribing:
 2. prescribing vitamins/minerals in the absence of suggestive clinical signs or laboratory evidence of

their deficiency (treatment is not justified if there is no deficiency)

3. prescribing broad spectrum antibiotics for all patients with dysentery (may not be justified as the risk of antibiotic associated colitis will be increased, and the disease is usually self limited)

3. Once treatment is justified, to decide which particular drug to use, the prescriber goes through the process of;

1. Selecting the therapeutic class; e.g.,
 - a. antibiotics for infection (simple case);
 - b. cardiac glycosides/vasodilators/diuretics for congestive heart failure (complicated case)
2. Selecting group of drugs within the class; the choice of antibiotics depends on
 - a. sensitivities,
 - b. site of infection,
 - c. feature of patients such as contraindications
 - d. availability and affordability
3. Selecting a particular drug in the group; e.g., amoxicillin, among the penicillins.
4. one may choose a drug in favor of another based on different factors, such as:
 - a. kinetics
 - i. absorption; e.g., bumetanide better absorbed than frusemide
 - ii. distribution; e.g. lincomycin in bone
 - iii. biotransformation; e.g., avoid opioids in liver disease for they are extensively metabolized by the liver
 - iv. excretion; e.g., avoid aminoglycosides in case of renal impairment.
 - b. dynamics
 - i. efficacy could be the basis for the choice; e.g., sulfonyleureas are more effective than biguanides in the treatment of type II diabetes mellitus
 - c. therapeutic effect
 - i. features of the disease; e.g.,
 1. choice of penicillin or cotrimoxazole for a patient with bronchopneumonia as the likely

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- organism is pneumococcus or H-influenzae;
 - 2. aspirin or paracetamol for mild pain and morphine for severe pain
 - ii. coexisting disease: e.g.,
 - 1. thiazides for hypertension with ventricular failure;
 - 2. beta blockers for hypertension with angina
 - iii. avoidance of adverse effects: e.g.,
 - 1. short acting benzodiazepines (temazepam) preferred to long acting (nitrazepam);
 - 2. Erythromycin for patients hypersensitive to penicillin
 - iv. avoidance of contraindications: e.g., avoid aspirin in a patient on warfarin treatment
 - v. patient compliance: e.g., once daily atenolol is preferred to three times a day alpha methyl dopa.
4. Route of administration: e.g.,
- a. Crystalline penicillin is given by intravenous route for severe infections; Intramuscular benzathine penicillin monthly or oral penicillin daily can be given for rheumatic fever prophylaxis.
 - b. Beta agonists like salbutamol are given through nebulizers or inhalers in acute asthmatic attack for fast action.
5. Formulations : e.g.,
- a. oral formulations include tablets, capsules, granules, elixirs, suspension; injection formulations include lyophilized powders, solution.
 - i. For acute pain, prescribe soluble buffered aspirin because of fast action
 - ii. For chronic rheumatic disease, prescribe enteric-coated formulation
6. Dosage regime(dose) frequency/timing of administration: the following need to be considered
- a. Kinetic variability: for poor absorption prescribe larger dose or prescribe another drug/route
 - b. Dynamic variability: for less effect, prescribe larger dose

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- c. Characteristics of the patient: tailor the dose according to body weight and other factors while prescribing
 - d. Characteristic of the disease: e.g., dose of codeine used to suppress cough is lower than that required to relieve pain
 - e. Choosing a dosage regimen by
 - i. referring to a reliable source of information
 - ii. considering dose related toxicity
 - iii. deciding the initial dose: when there is no guide, start with low dose and increase gradually (ACE inhibitors, levodopa); for some drugs to increase the dose may be necessary because of tolerance (opiates); sometimes starting with a loading dose before giving a maintenance dose is required (digoxin); in some cases to start with high dose and reduce gradually might be required (corticosteroids)
 - iv. Considering kinetic factors which may alter dosage requirements: e.g., impaired renal function
 - v. Considering dose response relationship for the patients: e.g., higher dose of insulin for ketoacidosis, and lower dose of antipsychotic drugs in treatment naive patients
 - vi. Considering other patient characteristics like age, sex weight, etc
 - f. Frequency of drug administration:
 - i. usually fixed for a given formulation;
 - ii. sometimes may be altered (e.g., splitting the dose of spiranolactone
 - 1. in two to avoid GI irritation),
 - iii. frequency of nitroglycerin administration depends on the
 - 1. frequency of symptoms
 - g. Timing of drug administration: The following are examples where timing is very important
 - i. To minimize ADR: tricyclic antidepressants to avoid dry mouth and drowsiness better to take it at bed time; potent diuretics better be given in the morning to avoid disturbance during the night
 - ii. Timing of symptoms: e.g., anginal attack, use of antacids
 - iii. Timing in relation to meals: penicillin to be administered before meal; aspirin to be administered with meal

7. Course of treatment

- a. Depends on the nature of the disease or symptom: e.g.,
 - i. A single dose of aspirin for headache; Insulin for chronic therapy; treatment with H₂ blockers require six weeks as healing occurs with in this period, but longer periods of nightly administration may be required to prevent recurrence.
- b. Duration of treatment of infection depends on

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- i. The infecting organisms
 - ii. Site of infection
 - iii. Response to treatment
 - iv. Dosage of antibiotics

Chapter 3

The concept of P-treatment and P-drugs

The first step in rational treatment is **defining the patient's problem, which is making a correct diagnosis**. Once a diagnosis is made, one has to **specify his/her therapeutic objective**, what the physician wants to achieve with the treatment to be applied. Based on the therapeutic objective, one **chooses a treatment** of proven efficacy, safety, suitability and affordable cost from different alternatives.

In choosing your treatment it is important to remember that not all health problems need treatment with drugs. The treatment may consist only of giving patients' advice and information about their illness, non-drug therapy, treatment with drug, or a combination of these. For every diagnosis you make, the treatment plan you choose will be your **P (personal)-treatment**.

When for a certain diagnosis your P-treatment consists of drug treatment, you have got to choose a drug(s), on the basis of efficacy, safety, suitability, cost and availability. This will be your **P - (personal) drug**.

P-drugs are list of drugs every subscriber got to choose for a particular problem based on the National Essential Drugs list and the Standard Treatment Guideline (STG) for Ethiopia. The prescriber, by choosing P-drugs which he prescribes regularly, becomes familiar with their effects and side effects. The P-drug concept is more than just the name of a pharmacological substance, it also includes the dosage form, dosage schedule and duration of treatment.

Chapter 4

Guideline for selection of P-drugs

In selecting p-drugs, the prescriber needs to consider the following:

1. Defining the diagnosis

Selecting a P-drug is choosing a drug for a common condition, not for individual patients. To select P-drugs for a given condition, considering the pathophysiology of the disease is important. Knowledge of the pathophysiology of the disease helps identify the possible site of action and the maximum therapeutic effect of the drug to be used.

2. Specifying the therapeutic objectives

One should ask what he/she wants to achieve for the disease condition?

3. Making an inventory of effective groups of drugs through

- Linking the therapeutic objectives to various drugs
- Considering efficacy as the first criterion for selection
- Looking at groups of drugs rather than individual drugs

All drugs with the same mechanism and similar molecular structure belong to one group, e.g., benzodiazepines, β -blockers. Most active substances in a group share a common stem in their generic name, e.g., diazepam, lorazepam

4. Choosing effective group of drugs according to the following criteria;

a. Efficacy

- To be effective the drug has to reach a minimum plasma concentration
- Kinetics of the drug should be considered

b. Safety

- Possible side and toxic effects should be considered
- Incidence and severity of potential side effects must as well be considered

c. Suitability

- Convenient dosage forms, frequency of administration, route of administration, potency and other kinetic data should be considered to determine suitability

d. Cost of treatment

- The cost of treatment is always an important criterion for all countries. It will be even more important in economically disadvantaged countries.
- The total cost of treatment, i.e., drug cost, hospital cost and other costs required for the whole course of therapy, should be considered.

5. Selecting the P-drug

Selecting P-drugs requires several processes:

- Selection of the drug based on the four criteria mentioned above.
- Selection of the dosage form based on the kinetics of the drug
- Selection of standard dosage schedule based on clinical investigations
- Selection of standard duration of treatment based on the pathophysiology and prognosis of the disease

Chapter 5

TREATMENT WITH P (personal) - DRUGS

Once P-drugs are selected for a given condition, one has to verify the suitability of the P-drug to each patient. Not all the P-drugs could be convenient to every patient. Then one has to consider several steps for the process of choosing the best P-drug for a given patient. These steps are described as follows using case examples:

Cases Examples on treatment with P-drugs

Section I. Defining patient's problem.

The first step in treatment with a P-drug is to **define the problem** of a given patient. The following cases describe patients who mainly presented with complaints of cough but further clinical assessment and some laboratory tests disclosed that they have all cough for quite a different medical problems.

Case 1:

Ato Tufa is a 40 years old male patient who came to a clinic with complaints of **cough**. He denies any other major symptoms like fever or purulent sputum. Physical examination was unremarkable except for the presence of mild redness in the throat.

Case 2:

W/o Alemitu is a 35 years old Nurse who came to Bethezatha hospital with complaints of **cough**, dyspnea and wheezing. She admits that her complaints gets worse during cold weather and her mother is a known case of bronchial asthma. Has no fever or purulent sputum. Physical examination was unremarkable except an expiratory wheeze heard all over the lung fields.

Case 3:

Abebe is a 28 Years old male patient who was seen at Black lion hospital with complains of **cough**, fever and night sweats of two months duration. His cough is associated with intermittent bloody sputum and has lost significant amount of body weight. His sputum was found to be positive for AFB.

Case 4:

A 40 years old male patients was seen at a near by clinic with complaints of **cough**, dyspnea, fever and right side chest pain. He was treated with penicillin a week back for presumed pneumonia but had discontinued the treatment after he took it only for three days. Physical examination and chest x-ray confirms the presence of right side pleural effusion.

Discussion of cases:

Although cough seems to be one of the major complaints in all of the above four cases, they actually have quite a different diagnosis.

Case 1. The main problem in this patient is persistent dry cough and slight redness in the throat .The most likely causes could be the mucous membranes of the bronchial tubes, that is affected by the cold and therefore can easily be irritated. A secondary bacterial infection seems unlikely because patient doesn't have history of fever or purulent sputum. This patient may not need any drug let alone antibiotics.

Case 2. This case is completely different from the above case. Because besides the cough, she has additional symptoms of wheezing and dyspnea, which are suggestive of bronchial asthma.

Case 3. In this case, the clinical presentation suggests pulmonary tuberculosis. The diagnosis was later confirmed by a positive smear for AFB

Case 4. This patient has developed para-pneumonic effusion because of inadequate treatment of his pneumonia. The premature discontinuation of penicillin is the most likely explanation for the development of the effusion.

These examples show that a single complaint may be related to different specific diagnosis.

Section II. Therapeutic Objective

The second step in the selection of a P drug is to specify the **therapeutic Objective** based on the diagnosis. This refers to what we want to achieve with the treatment. This could be illustrated by using the following examples.

Case 5: A 2 years old girl came to the emergency room with complaints of frequent and watery diarrhea of 48 hours. She didn't pass urine for the

last 24 hours. On physical examination, she was found to be lethargic with dry and coated tongue. No fever was detected but has very poor skin turgor.

Case 6: An 18 years old school girl came with complaints of mild sore throat. During the review of other systems, after some hesitation, she admits that she is actually three months pregnant.

Case 7: A 12 years old girl who is a known case of bronchial asthma came to Zewditu hospital with an acute asthmatic attack. The cough was dry and has no associated fever. She was seen a few days ago for a similar complaint and was sent back with Ventolin inhaler.

Discussion of cases (5-7):

Case 5(Diarrhea with severe dehydration)

The main problem in this child is severe dehydration due to frequent diarrhea. The watery nature of the diarrhea and the absence of fever suggest viruses to be the most likely cause of the diarrhea. The therapeutic objective in this case is therefore to prevent further dehydration and to rehydrate the child. There is no place for the use of antibiotics.

Case 6(pregnancy)

Actually the main concern of this patient seems to be the pregnancy rather than the mild sore throat. Therefore the therapeutic objective very much depends on her attitudes towards her pregnancy. Appropriate information and counseling about pregnancy may be all what she needs at this particular time. In fact drugs should be avoided as much as possible, at this early stage of gestation.

Case 7(poorly controlled asthma)

This patient seems to have recurrent attack despite treatment with a bronchodilator. It is important to note that asthma is not a mere occurrence of broncho-constriction. There is in fact associated marked airway inflammation. The reason for recurrence is simply because of lack of drugs, which would control the underlying airway inflammation. The therapeutic objective is, therefore, to control the bronchial inflammation by the use of anti-inflammatory agents like steroids in addition to the use of bronchodilators.

Section III. Verifying suitability

It is not always possible to assume that the first drug of choice will be suitable for every patient. Therefore, one has to verify the convenience of the P-drug for that particular patient..

One can start by looking up his/her P-drugs, and check for the suitability of the drug, dosage form, dosage schedule and duration of treatment in view of effectiveness (indication and convenience of the dosage form), and safety (contraindications and possible interactions).

III a Drug and Dosage forms

Though P-drugs are selected primarily on the basis of efficacy and safety, one has to verify that the selected P-drug and the standard dose is suitable for an individual patient. The efficacy of a drug can be reduced by a concomitantly taken drug that reduce its bioavailability.

The safety of a drug for a particular patient depends on contraindications and interactions. Always consider whether a given drug is contraindicated, particularly, in high-risk groups and patients with high risk factors. High-risk groups include pregnant women, lactating mothers, children and the elderly. High-risk factors include liver disease, renal failure, hypersensitivity reactions and concomitant diseases. Contraindications are determined by the characteristic of the patient (high risk patients) and the mechanism of action of the drug. Interactions occur between the drug and other concomitantly administered substances including drinks and food.

Verifying the suitability of the P-drug based on the drug and dosage form can be illustrated using the following examples:

Case 8.

A 25 years old patient who has been on short course anti-TB therapy for the last 4 weeks came for re-valuation. He was also found to have HIV infection with a CD4 count of 50 cells/mm³. He was subsequently put on HAART using AZT, Lamivudine and Nevirapine regimen.

Case 9.

A 2 years old boy has presented with complaints of cough and fever. He was diagnosed to have acute Lower respiratory tract infection (ALRI). One of your P-drugs for such condition is doxycycline.

Case 10.

Ato Tolosa is a 45 years old mechanic living in Jimma. He is a known case of asthma for which he uses salbutamol inhaler .He was recently diagnosed to have hypertension (BP 150/110 mmHg) and he is put on Atenolol 40mg twice per day. (Note that Atenolol is your P drug for the treatment of hypertension).

Discussion of cases (8-10):**Case 8**

Nevirapine is one of the first line ARV drugs in the treatment of HIV in Ethiopia. How ever it is not suitable to be used for patients who are taking Rifampicin containing anti-TB drug regimen. This is because of increased risk for drug induced hepatitis. Therefore although Nevirapine is one of the P-drug for ART in this country, it is not suitable to be used in this particular patient. Other NNRTI like Efavirenze could be used instead.

Case 9.

Doxycycline could be selected as the P-drug for the treatment of acute Lower respiratory tract infection (ALRI) but it is not generally suitable for younger children as it would cause discoloration of the teeth and may also interact with milk. Hence it is not suitable to treat bacterial infection in younger children. Other alternative P-drug like cotrimoxazole or Amoxil could be used.

Case 10.

Atenolol is one of the preferred drugs for the treatment of hypertension in-patients below 50 years of age and it is very convenient. However, like other beta-blockers, its main side effect is broncho-constriction so that it is relatively contra-indicated in asthmatic patients. If the hypertension is not severe, atenolol can still be prescribed in low dose (≤ 50 mg/day). Other wise, in severe cases, one should switch to the second P-drug selected.

III. b Dosage Schedules

A dosage schedule should be convenient, i.e., simple. For example 2 tablets a day is more convenient than one tablet two times a day. Complex dosage schedules reduce patient compliance leading to a decrease in effectiveness.

The dosage schedule can be adjusted by changing the dose or frequency of administration or both. Changing the daily dose changes the mean plasma concentration, while changing the frequency of administration defines the fluctuation in plasma. For example, twice daily administration of 100 mg will give the same mean plasma concentration as that of 50 mg four times daily, but with more fluctuations in plasma level. The minimum fluctuation can be achieved by administering 200 mg in 24 hours by a continuous infusion. Before one decides to reduce either the dose or the frequency, one should consider the nature of the drug whether high peak plasma concentration is required to be effective as in the case of antibiotics. If high peak concentration is required for effectiveness of the drug, the frequency should be reduced not the dose. On the other hand, increasing the dose increases both the mean plasma levels and fluctuations. The safest way to prevent fluctuation is to increase the frequency. Some drugs such as some antiepileptic drugs, tricyclic antidepressants and alpha blockers, might be started treatment with a slowly rising dosage schedule.

Verifying the suitability of the P-drug based on the dosage schedule can be illustrated using the following examples:

case 11. Abraham complains of mild, intermittent crampy abdominal pain associated with diarrhoea. Stool examination showed Giardia Lamblia Trophozoites. He was given metronidazole 400 mg 3 times a day for 5 days. Two days later he returned reporting nausea and abdominal discomfort each time he takes the drug, hence is unable to continue treatment.

Case 12. Ayalew is a 35 years taxi driver came for the treatment his genital herpes. He says these painful lesions were coming almost every month for the last one year. He was prescribed acyclovir 200 mg 4 times per day for long term suppression,

Discussion of cases (11&12)

Case11, Giardiasis can be effectively treated with a single dose of 2 gm Tinidazole and obviously would have been less of trouble.

Case12, This patient needs to take acyclovir continuously to suppress recurrence of his ulcers. A twice daily dose of 400mg or even a once daily dose of 800 mg will be a more convenient schedule for this busy taxi driver.

III .c Duration of Treatment

Another issue is to verify whether the standard duration of treatment is suitable for a given patient, in terms of efficacy, safety and cost. Longer duration of treatment than needed might result in unnecessary adverse effects, drug dependence, inconvenience to the patients, wastage of the scarce resources, etc. Shorter duration of treatment than required also results in ineffectiveness and unnecessary wastage of resources for ineffective treatment.

Verifying the suitability of a P-drug based on the duration of treatment is illustrated using the following examples:

Case 13.

A 25 years old woman comes with complaints of generalized body weakness and easy fatigability. Physical examination is unremarkable except the presence of slight pallor. Her Hemoglobin result is not known. She is prescribed ferrous sulfate 100-mg tablets, to take 1 tablet three times daily for 10 days.

Case 14.

A 50 years old accountant comes for a refill. He was given prescription to buy Diazepam, a total of 60 tablets. He was advised to continue taking the drug one tablet before sleeping as previously.

Discussion of cases (12-13):

Case 13.

In this patient, prescription is given without a clear therapeutic objective. If anemia was considered as a cause of her body weakness, the hemoglobin should have been measured and if the diagnosis of iron deficiency anaemia is confirmed iron should have been given for several weeks and months with regular hemoglobin measurements rather than being prescribed only for ten days.

Case 14.

Giving out psychoactive drugs for a longer period without adequate supervision is not rational. The medical record of this patient actually reveals that he had taken his refill just 02 weeks ago. With further questioning, he admitted that he has been taking 5-mg tablets q.i.d since recently. This kind of treatment would of course leads to severe dependancy and could also be quite expensive
Appropriate corrective measures have to be taken in time instead of keeping on prescribing the refills.

Section IV. Writing a prescription:

A prescription is an important therapeutic transaction between the prescriber and drug consumer through a dispenser, It is a written order of the prescriber for one or more medication, and instructs the dispenser how to prepare and dispense drugs and the patient how to use them.

A prescriber is a health professional who makes the diagnosis and orders drug(s) to patients. All prescribers are not at the same professional level. They may range from nurses to sub-specialists.

Classes of prescription

1. precompounded prescription, prescribing ready made dosage forms
2. compounded (extemporaneous) prescription, prescribing medicines to be prepared by the dispenser as per the instruction of the prescriber

Requirements for a prescription

- Should be written on a standard prescription blank
- Should be written in ink
- Should be legible
- Should be written in generics, as brands could be expensive, promotional and do not give freedom to the dispenser to dispense the most affordable one.
- Should be clear, not ambiguous
- Should be written in English with some Latin abbreviations
- The quantity of ingredients should be expressed in metric system

Content of prescription paper

According to **Guidelines for the control of use of prescription paper**, published by the Drug Administration and Control Authority of Ethiopia, the content of any prescription paper should include the following information:

1. Serial number and area code.
2. Name, level and address of the health institution.
3. Full name, age, sex, card number and address of the patient.
4. Type of diagnosis or International classification of disease (ICD) code number.
5. Name, strength, dosage form and dose of the drug.
6. If the drug is to be compounded, the type of ingredients needed, how to prepare it, and directions on how to use it.
7. If the drug is refillable directions for refill.
8. Prescriber's name, qualification, registration number, and signature and the date on which prescription is written.
9. Dispenser's name, qualification, registration number, and signature and the date on which the prescription is filled.
10. Summarized directions to be followed by prescribers and dispensers.

Examples on prescription writing

Case 15.

A 25 years old man diagnosed to have Typhoid fever. The P drug is Chloramphenicol.

Case 16.

A 2 years old boy, weighing 12-kg is diagnosed to have acute otitis media. The P drug is Cotrimoxazole.

Sample prescriptions.

For case 15:

Serial No. 00001

Name of the health institution Black lion hospital

Address: Reg.14 Town A.A Tel 0111511211

Patient's Name: Eyob Tessema Age 25 Sex M

Card No. 334995

Address: Region 14 Town A.A Sub-city Arada

Kebele 17 House No. 1002

Diagnosis (ICD code No.).....

Date: 12/12 /97

Treatment given(Drug name, strength, dosage form, dose &duration)	Price of each item(for dispenser use only)	
R / 1. Chloramphenicol 250 mg capsule # 112 sig. 2 capsules every 6 hourly p.o for 14 days.		
2. Paracetamol 500 mg tablets # 20 Sig. two tablets every 6 hourly, p.r.n		

Prescriber's

Full Name

Balcha Degefu

Qualification

Internist

Registration

0127/95

Signature

For case 16:

Serial No. 00002

Name of the health institution Betezata hospital

Address: Reg.14 Town A.A Tel 0115515068

Patient's Name: Abeba Lemma—Age 2 Sex F Card No. 165349

Address: Region 14 Town A.A Sub-city Bole

Kebele 10 House No. 005

Diagnosis (ICD code No.).....

Date: 15/01 /98

Treatment given(Drug name, strength, dosage form, dose &duration)	Price of each item(for dispenser use only)	
R / Cotrimoxazole 240mg/5 ml suspension # 1 bottle sig. 1 tea spoon every 12 hourly p.o for 7 days		

Prescriber's

Full Name Balcha Degefu

Qualification GP

Registration 1847/93

Signature

Section V. PROVISION OF INFORMATION TO PATIENTS

Many patients do not take the prescribed drugs correctly, or regularly or do not take them at all for the following reasons:

- Complicated dosage schedule
- The drugs not perceived as effective
- Disappearance of symptoms
- Occurrence of side effects.

Patient non-compliance may not have serious consequences for drugs with long plasma half lives, but effectiveness will highly be compromised with drugs having short plasma half lives.

Patient compliance may be improved by

- Prescribing a carefully selected P-drug

Creating a good prescriber-patient relationship, established through respect for the patients feeling and idea, thereby making the patient treatment partner

- Providing the necessary information

The information should provide the knowledge to accept and follow treatment, and to acquire the necessary skills to take the drug as prescribed. The information should be given clearly in a language the patient understands, and should be checked whether the patient has understood the information correctly by letting him/her to repeat it in his/her own word.

The minimum information that should be provided to patients include

- Drug effects
 - the role of the drug
 - disappearance of symptoms
 - onset of action
 - consequences of stopping the drug or using it incorrectly
- Side effects
 - types of the side effects
 - ways of recognizing the side effects
 - duration of the side effects
 - seriousness of the side effects

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- actions to be taken
 - Instructions
 - route of drug intake
 - time of drug intake
 - duration of drug intake
 - drug storage conditions
 - Warnings
 - Contraindications
 - maximum dose
 - the need for full treatment course
 - Future consultations
 - date of next appointment if needed
 - circumstances in which coming earlier is needed
 - Clarity of the information
 - checking whether the information is understood
 - allowing patients to ask some more questions

It is the responsibility of the prescriber to make sure that the treatment plan is understood and accepted by the patient. This responsibility should not be left to the dispenser.

Examples Concerning Provision of Information to patients

Case 17.

Alemu is a 40 years old teacher who has stage IV HIV infection (AIDS). He is just been started on ART with the following regimen: AZT, 3TC and Efavirenz.

Case 18.

Workinesh is a 35 years old athlete from Addis Ababa. She is diagnosed to have peptic ulcer, for which she is given Cimetidine 400mg-mg tablet to be taken twice a day for four weeks.

Illustration

Case 17.

HIV is a chronic viral infection that leads to severe immune deficiency, which will ultimately leads to death if left untreated. There is no cure for HIV yet but there are nowadays very effective drugs, which suppresses multiplication of the virus. This results in boosting the immunity of the patient and ultimately prevents the occurrence of life treating opportunistic Infections and hence and prolongs survival The treatment is however complex and it has to be taken life

long. Therefore there is a significant risk that many patients may not take their medicine as prescribed. Hence adequate and appropriate information should be given to such patients as follows:

- To take their drugs daily exactly as prescribed and never to stop taking the drugs suddenly
- Advise your patients to follow a regular time for their drug intake.
- Warn patients for common side effects of the drugs. For instance, AZT may lead to profound anemia and some GI upset. Efavirenz is often associated with some CNS side effects ranging from simple sleep disturbance to frank psychosis. Reassure them that most of these side effects will disappear after a couple of weeks. However in those patients with severe symptoms, they should be advised to report early.
- Patients also be advised not to drink alcohol, chew betel nut and from having unprotected sex
- Underline the importance of having a regular follow up. This will help the treating physician not only to evaluate patient's response to treatment but will also enable him to monitor for drug side effects.

Case 18.

In this case the patient should be informed that:

- The drug reduces the acidity of the gastric contents and relieves the pain
- Take 1 tablet twice a day for about 4 weeks
- The patient will begin to feel better soon after she takes the medication but it takes a longer time to get cured
- May cause mild diarrhea, otherwise doesn't have serious side effects
- In addition to drug therapy, she should also try to take non-drug measures like avoiding smoking. She should also be advised to refrain from taking drugs such as Aspirin, NSAID and alcohol as these will reduce the chance of cure of the PUD.

Emphasize also on the importance of having a regular follow up in the future

Section VI

TREATMENT MONITORING

Treatment monitoring is required to determine whether the treatment has been successful or additional action is needed. To do this the prescriber should maintain contact with the patient and gather information on whether the treatment was effective or not, and whether side effects occurred or not. This can be achieved through either of the following ways.

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- Passive monitoring the prescriber explains to the patient to report back if the treatment is not effective, is inconvenient or significant side effects occur.
 - Active monitoring, in which the prescriber makes an appointment with the patient to determine how effective the treatment has been and whether side effects developed. How soon the prescriber would like to see the patient after administration of the treatment and how frequently follow up visits will be depend on type of illness, the duration of treatment, and the maximum quantity of drugs to prescribe.

If the disease is cured the treatment can be stopped. If not cured or chronic the treatment can be continued provided it is effective and there are no side effects. If serious side effects occurred, the selected drug and its dosage schedule should be reconsidered and whether the patient took the treatment correctly be checked.

If the treatment has not been not effective, the diagnosis, the prescribed drug(s), the instruction given to the patient, patient compliance and the monitoring process should all be reconsidered.

Examples concerning treatment monitoring and the importance of a follow up visit.

Case 19.

Captain Tesfaye is a 35 years old pilot who was diagnosed to have pneumonia and has just finished a course of antibiotic treatment with Amoxicillin 500mg three times a day for one week. He is a known smoker for over 20 years. When he returned back for a follow – up, he was rather sick with additional complaints of fever and body weakness. He has started producing copious amount of purulent sputum mixed with blood.

Case 20.

Yimer is a 28 years old farmer who was diagnosed to have pulmonary TB some 04 months ago and took anti-TB medication for the first 03 months. When he comes a month later, he admitted to his doctor that he has not been taking the anti-Tb drug since the last one month, as he feels perfectly healthy.

Case 21.

Ato Tofic is a 60 years old merchant from Harar, who is a known case of type II diabetes. He has been taking Lenti insulin 30 iu in the morning and 20 iu in the evening .How ever during the recent follow up, the patient has noted frequent fainting attacks and palpation although he takes his meal and medications as usual. His FBS were all below 50-

mg% when ever he has these symptoms. All these have occurred after he began to notice intermittent leg and facial swellings.

Case 22.

Azeb is a 25 years old known HIV patients who have been put on ART for the last 02 months. She has been taking AZT, 3TC and Nevirapine. She was doing fine until the last 2 weeks when she started to feel very week and easily tired.

Discussion of cases (17-20):

Case 19.

This patient seems to have developed one of the local complications of pneumonia. A control Chest x-rays shows multiple lung abscesses. He has to therefore be admitted and put on high dose parenteral antibiotics for a couple of weeks.

Case 20.

One of the challenges of patients who are put on prolonged therapy is to continue taking their medication when they do not have any complaint. That is exactly what happened to this patient! Actually most of the TB symptoms will disappear within 02 months of the start of effective treatment. However the treatment still has to be continued for about 6-8 months in order to achieve cure and prevent development drug resistance. We should always explain this to patients at the start of treatment and need to encourage them to complete their treatment during subsequent follow-ups.

Case 21.

This patient seems to have frequent hypoglycemic symptoms. Prior to the developments of these symptoms, he gave history of leg and facial swellings. . Such history is very much suggestive of development of diabetic nephropathy with some degree of renal failure. This may lead to reduced rate of insulin excretion. This has to be confirmed with appropriate Lab. investigation and the dose of insulin has to be adjusted accordingly.

Case 22.

Further evaluation of this patient has revealed that she has developed marked anemia with hemoglobin of 4 gm %. Anemia is one of the common complications of AZT and this is probably what is has happening in this patient. Therefore the AZT has to be discontinued and be replaced by other drugs like Stavudine. Patient also requires blood transfusion.

Chapter 6

UPDATING DRUG INFORMATION

As knowledge about drugs is changing, new drugs are being developed. Drugs known to be effective and safe in the past may not be as effective or safe as more information about the drugs are gathered. Hence, updating knowledge on every drug we are bound to use is indispensable for good prescribing practice. In most health institutions in Ethiopia, drug information resources are scarce. A concerted effort should be made by all concerned to alleviate this problem. Ultimately, it is the responsibility of every subscriber to equip himself/herself with the necessary information for a safe practice. So prescribers should try to update themselves through what ever means available to them. Listed below are some of the sources to look for drug information.

Such sources include:

- Standard treatment guidelines
 - Are disease centered
 - Provide clinical information on drugs
- Drug formularies
 - Are drug centered
 - Provide information on a list of pharmaceutical products
 - Can be national or institutional
- Pharmacology books
 - Provide information on basic or clinical pharmacology
 - Books revised frequently provide up-to-date information
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- Drug bulletins
 - Provide unbiased information
 - Select topic of national importance
 - Published frequently
- Health Journals
 - Provide important new information on drugs
- Drug information centers
 - are accessible to all health professionals
 - provide recent information on drugs
- Verbal communication
 - informal way of getting recent information on drugs from drug specialists
- Pharmaceutical industries
 - may provide biased information
 - the information might be promotional

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- disseminate information through medical representatives or direct mailing to prescribers
 - Internet
 - Easily accessible information
 - Provides more recent information

Subscribers also have the responsibility of not taking promotional drug information at face value, counter-check and verify the information before embarking on subscribing, particularly new products.

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N.B.

1. The Prescription should bear the seal of the health Institution
2. Prescribers should
 - write the prescription correctly and legibly
 - treat prescription paper as personal cheque book
 - be receptive to calls from dispenser who is trying to verify prescription
 - use ICD code No. for diagnosis that have impact social stigma
 - write refill order as per the list of refillable drugs
3. Dispensers should
 - Check if the prescription is legible and neat in appearance
 - review prescription carefully and verify with prescriber if it is incorrectly prescribed
 - Keep filled and blank(when applicable) prescription paper in the pharmacy section
 - Register and keep filled prescription for at least two years
 - do not dispense copied and indeleted prescription.
 - Dispense single prescription for one time only unless stated as refill for refillable drugs
