EM/PHARM/96
EM/INC.MTG.ESS.DRG.PHC./10

February 1984

REPORT ON INTERCOUNTRY MEETING ON ESSENTIAL DRUGS FOR PRIMARY HEALTH CARE

Amman, 26 September - 2 October 1983

The views expressed in this report do not necessarily reflect the official policy of the World Health Organization.

TABLE OF CONTENTS

OPENING CEREMONY

The World Health Organization's Intercountry Meeting on Essential Drugs for Primary Health Care took place at the Amra Hotel, Amman, Jordan, from 26 September till 2 October 1983. It was organized by WHO in collaboration with the Ministry of Health, Government of Jordan. Participants were drawn from Afghanistan, Bahrain, Cyprus, Democratic Yemen, Egypt, Jordan, Pakistan, Saudi Arabia, Somalia, Sudan, Syria and the Yemen Arab Republic. There were additional observers from the host country. The list of participants and observers is shown in Annex I.

Inaugurating the meeting the Minister of Health, H.E. Dr Zohair Malhas, traced the history of medication from herbal and traditional home remedies to the WHO programme in the field of drugs and pharmaceuticals. He stressed the need for effective drug control and indicated that the number of items in the drug list of Jordan had recently been reduced from over thirteen thousand items to only three thousand. He welcome the initiative of the World Health Organization in organizing this meeting and felt it was important that the use of the essential drugs in primary health care be placed on a sound basis and that awareness should be created regarding the prescribing, storage and use of these drugs(Annex VI).

In his message (Annex III) to the participants, Dr Hussein A. Gezairy, Regional Director, World Health Organization, welcomed the participants to the meeting and expressed his gratitude to the Government of Jordan for hosting the meeting at Amman. Dr Gezairy emphasized the need for all three of the components linked together for the successful implementation of the Action Programme on Essential Drugs to be developed and implemented in such a way as to complement each other. These were (a) the selection of a number of basic or essential drugs, (b) training of community health workers in the proper use of these drugs and (c) development of a system for efficient distribution of drugs at the primary health care level. He was happy to see that all three of these subjects were to be discussed at the meeting.

The Regional Director stated that it was unfortunate that in some of the countries, where resources were most lacking, wastage and unnecessary expenditure were the greatest. He indicated that the World Health Organization would do everything possible to collaborate with Governments to remedy this unsatisfactory situation. He then outlined the different activities initiated by the Organization in collaboration with the Governments of countries in the Region in the field of drugs and pharmaceuticals. These included strengthening national capabilities in drug regulation, development of a network of drug quality control centres, publication of objective, unbiased information about drugs, initiation of studies in drug utilization, training of all categories of personnel involved in the use of drugs including development of centres of clinical pharmacology, and strengthening and updating drug legislation and drug regulation wherever needed.

I. INTRODUCTION

Dr Ranjit Roy Chaudhury welcomed the participants and outlined the objectives of the meeting which were :

1. To share the experience of countries in the use of a limited list of essential drugs for primary health care;

2. To identify a core list of essential drugs for use by primary health workers;

3. To prepare appropriate Drug Information Sheets for the core list of essential drugs which could be used by the community health worker;

4. To discuss use of essential drugs at the primary health care level and make recommendations which would lead to rational use of such drugs and

5. To draw up the logistics of procurement, storage and distribution of drugs and recommend measures to ensure a regular uninterrupted supply of the essential drugs at the primary health care level.

Dr Chaudhury delineated the advantages of having a core list of drugs for a group of countries. These were :

a. Community health workers and also doctors could be more easily trained in the better use of a limited number of drugs;

b. Quality control laboratories could handle better, with limited resources, tests needed for a smaller number of drugs;

c. Pooled procurement of drugs leading to their purchase at greatly reduced prices was possible only if there was a core list common to several countries;

d. Local manufacture to meet the needs of a group of countries was possible only if there was a common list of drugs in those countries;

e. Information on the drugs being used could be collected and disseminated more easily if there was a limited list of common drugs in several countries.

II. AGENDA

The provisional agenda was adopted. It was agreed that local manufacture of drugs would also be discussed under item 10 of the agenda. The programme of the meeting is shown in Annex IV.

III.ELECTION OF OFFICERS

Dr Suleiman Qubain (Jordan) and Dr S. Hashimi (Afghanistan) were elected Chairman and Vice-Chairman of the meeting. Dr A. Markides (Cyprus) and Dr M. Akabat (Yemen Arab Republic) were elected rapporteurs.

IV. PRESENTATION BY COUNTRIES OF EXPERIENCE IN THE USE OF A LIMITED NUMBER OF DRUGS FOR PRIMARY HEALTH CARE

Participants from twelve countries presented their country situation papers and copies of their papers were circulated. A summary was given of the organization of primary care services in each country, the level of training of the staff at the primary health care facilities; the primary health workers (PHWs) or community health workers (CHWs), and the drugs provided for their use.

During the presentation of the experience of countries in the use of a limited number of essential drugs for primary health care, Dr Gezairy participated in the meeting for some time. He stressed the importance of the meeting and discussed several issues which were pertinent to the deliberations. He raised the problem of manufacturers of drugs supplying substandard, inactive and inappropriate drugs to the developing countries. He emphasized the importance of providing coverage with essential drugs for the entire populations of the countries and stated that there were still large areas in some countries in the Region inaccessible to drugs. Coverage, he felt, could be increased if expenditure on drugs could be reduced. WHO would support efforts to organize bulk, pooled purchase of drugs which mechanism had been shown to reduce considerably the expenditure incurred on drugs by governments, as these were obtained at cheaper prices. Local manufacture of the essential drugs was another way of making drugs available at lower prices in the countries. He felt that it was important to ensure regular supplies of drugs throughout the year and also to provide the proper conditions for storage of drugs at the primary health centres.

COUNTRY EXPERIENCES

1. AFGHANISTAN : (Pop. 15,894,000 Area 647, 497 sq.km)

157 basic health centres (BHCs) and 132 sub-centres cover about 45% of the total population. A further 45% will be covered by 1988 by the establishment of a further 157 BHCs, leading to a total of 314 basic health centres and 320 sub-centres, covering about 90% of the total population. Primary health workers are of several types :

a) Traditional birth attendants. Since 1978, 2 317 have received training (seven week periods). These workers look after 75% of deliveries. This number will be extended to 7 000 by 1986. They now receive continuing education.

b) Village health workers who are literate and selected by villagers. They receive five months of training and refresher courses every three to six months : 214 have been trained and another 900 will be trained by 1992.

c) Female auxiliary health workers, who may be 12th grade, 6th grade or even less well educated, given six week training courses.

d) Mobile health units for 2 million nomads. Ten such units are about to start.

Three drug lists have been adopted :-

a) for traditional birth attendants (13 items)

b) for village health workers (30 items)

c) for basic health centres (doctors attending), and sub-centres (66 items).

2. BAHRAIN (Population 360,000 Area 622 sq.km.)

It is generally accepted that Primary Health Care is accessible to every individual and family in Bahrain by means acceptable to them.

It forms an integral part both of the country's health system of which it is the nucleus and of the overall social and economic development of the country.

There are at present seventeen (17) health centres. They include sections of radiology, pharmacy, laboratory, antenatal and dental care.

There are three categories of centres, namely Type A, B and C, and they provide medical care for 20 000 to 30 000, 10 000 to 20 000, and 10 000 of the population respectively, each centre providing for a specific area.

Every family is registered at one of these centres according to their location, with a family folder giving all the required medical information, when they need treatment.

The health centres are well equipped, have a fully stocked pharmacy in particular, and are operated by doctors with postgraduate training in family health.

In 1976 the primary health centres'drug requirements were categorized separately from the secondary health centres'requirements.

The primary health list contained nearly 400 items and the secondary list 1000. The selected drug list is reviewed annually and it now contains about 440 items plus 55 drugs for follow-up of cases referred by the secondary centre.

The annual drug budget is US$ 3.5 million, 40% being for primary care.

3. CYPRUS (Population 524,400 (1982), Area 9,251 sq.km.)

Medical care is provided both by the public health services and the private sector.

In 1982 in the public health services there were 249 doctors, 33 dentists and 31 pharmacists. In the private sector there were 415 doctors, 170 dentists and 255 pharmacists.

In the private sector there are in circulation about 3 000 drugs. These have to be registered and their price is fixed by the Ministry of Health. About 300 preparations are locally manufactured.

The public health sector covers the needs of about 70% of the population. In each of the four districts there is a general hospital. There are also 3 rural hospitals and 21 rural health centres, covering populations of about 5 000 and 120 sub-health centres. At each rural health centre there is a team consisting of at least one doctor, one pharmacist, one health visitor and one health inspector. This team visits, usually once a week, the surrounding sub-health centres.

Each year more rural health centres and sub-health centres will come into operation. A list of about 500 drugs (inclusive of the different dosage forms) has been prepared by the Drug Committee. These drugs are purchased yearly by generic name in adequate quantities for the entire population. They must be registered in Cyprus or the country of manufacture. Prior to distribution these are properly stored at the Central Medical Stores until analysis by the State General Laboratory indicates their quality.

All needs for parenteral solutions for correcting water, electrolyte and acid base disturbances as well as some other formulations are now prepared by the government pharmaceutical laboratory.

Apart from the drugs issued by pharmacists, acetylsalicylic tablets, some antacids, some laxatives, antiseptics and disinfectants may be legally sold in groceries.

In 1982 about US$ 5 million (CIF) or 16% total health expenditure was spent on drugs for the public health service. In the private sector US$ 10 million (CIF) was spent.

4. DEMOCRATIC YEMEN (Population 2.0 million, Area 333,000 sq.km)

Medical care is rendered free to all citizens. There are seven categories of health establishments spread all over the country. The Health Unit and the Medical Centre are peculiar to rural areas, while District and Governorate hospitals are established in cities and heavily populated areas. Aden, the capital, is unique in that it has People's clinics, labour clinics and teaching hospitals in addition to the other categories.

The Primary Health Care approach (PHC) was adopted by Democratic Yemen in 1980. This approach uses health guides, who are voluntary community health workers selected by the village who deal with personal hygiene, sanitation, health education and first-line treatment of specific cases at the village level.

The country as a whole adopts a standard drug list which contains 300 generic drugs. From this list, 10 are selected for the health guide, 20-45 for use in health units and up to 55 or more for health centres, depending on the doctors at each centre.

The number of drugs a hospital can have will depend on the type of specialities it contains. At present there are no restricted lists for hospitals, but in general a standard list of about 300 drugs can be used, with restrictions on some specialised drugs on that list. Teaching hospitals may use any drug on that list.

5. EGYPT (Population 41,990,000, Area 1 million sq. km.)

The majority of Egyptians have access to primary health care. 56% of the population lives in the rural sector and are served by 1,951 rural health units, 559 rural health centres and 52 rural hospitals.

All units are operated by doctors (1 unit/9,200 population and 1 doctor/6,500). The urban sector is served by 317 health bureaux (preventive and public health), 221 MCH centres (1/2500 population) 144 school health units, 129 general hospitals and 20 special hospitals. Primary care is also available at urban hospitals. In a pilot project 33 urban health centres have been built and it is eventually proposed to build 600 urban health centres. Each health centre has a full staff of general practitioners, dentists, specialists, etc. to provide integrated health care.

Rural health units and health centres are provided with 110 drugs (150 dosage forms).

Government and private expenditure on drugs (cost prices) is £500 million per annum.

6. JORDAN (Population 2.2 million (1979), Area 89,000 sq. km.)

Primary health care services are delivered from 96 health centres, 80 MCH clinics and 279 rural clinics. All health facilities are staffed by graduate physicians who are the sole prescribers of drugs. Services are comprehensive in nature and well integrated, providing both curative and preventive components.

All drugs used in Jordan must be registered with the Ministry of Health. A special committee regularly reviews new drugs for registration. Drugs must be re-registered every 10 years. In 1963 there was a list of 15 000 drugs which by continuing evaluation has been reduced to 1 800 by 1983.

A Directorate General of supplies in the Ministry of Health is responsible for tendering annually for drugs from the list of registered drugs. The Directorate General of Pharmacy and Drugs Control is responsible for quality control of drugs. The Directorate General of basic Primary Health Care services is responsible for supervision of drug use in its network of health facilities.

At present the health facilities at the PHC level draw their drug requirements from a national approved list of drugs containing 450 pharmaceutical products. A new list containing 100 drugs is being developed by a special committee for use by doctors at the PHC level.

The Ministry of Health's expenditure on drugs amounts to 1.5 million JD and is about 10% of the annual operational budget of the Ministry of Health. The annual per capita expenditure for the country on drugs is US$ 25.

7. PAKISTAN (Population 82,440,000, Area 803,943 sq.km.)

The PHC system in Pakistan is based on the Integrated Rural Health Complexes (IRHC). These are the functional units for the delivery of health services to the rural population. Each is composed of one rural health centre and 4-10 basic health units. The IRHC serves a population of 50 000 to 100 000 in an area of 150-250 square miles. The rural health centre is the focal point for management of delivery of services. It is staffed by one male and one female doctor, two mid-level supervisory health workers and two mid-level workers providing care. Each rural health centre is related to the District Health Officer through the doctors. The rural health centre provides health care and serves as a referral centre for its affiliated basic health units, plans and arranges preventive and promotive programmes, including family planning, collects data and serves as a drug and equipment warehouse.

The Basic Health Unit is the peripheral facility of the system. It serves a population of 5,000 to 10,000. Each Basic Health Unit is staffed with two mid-level health workers and supporting staff. The role of the Basic Health Unit is to provide health care and family planning services, to serve as a referral point for community health workers, to train CHWs and to supply them with drugs and medicines. The CHW is responsible for providing a limited range of preventive and curative care to the residents of his village.

Each rural health centre has provision for about 100 drugs (dosage forms) for common diseases prevalent in the area. Basic Health Units have provision for 15 essential drugs. The CHWs have provision for 5 drugs for common diseases prevalent in the area.

There are about 7 019 drugs registered in the Health Ministry in the country. About 25% of the total health budget is spent on provision of drugs by the Government. About 60% of the total population of the country benefit from PHC and the essential drugs provided by the Government at different facilities reach them.

8. SAUDI ARABIA : (Population 8,370,000, Area 2,149,690 sq.km.)

In Saudi Arabia 80% of all health care services is provided by the Ministry of Health. Primary health care is offered through PHC centres or dispensaries staffed by a group of medical personnel headed by at least one physician. These centres are backed by an efficient referral system to the nearest district hospital. Both curative and preventive medicine are integrated at these centres. Public health education has been started in urban centres through closed-circuit video. A more elaborate programme is being planned for the rural areas which would include seminars and group discussions with tribal leaders etc. A continuing education and evaluation programme is being planned for medical personnel.

In 1980 a list of 637 essential drugs was published by the Ministry of Health of which 16% or 110 drugs were determined for primary health care centres. However a revision of the list is needed, as requests for different types of drugs were being received from different centres. The new list should contain drugs for the treatment of common diseases, first aid and emergency drugs. The medicines at these centres should be of the same high quality as that used in hospitals. Physicians are to be encouraged to use as few drugs as possible.

For the current financial year, expenditure on drugs by the Ministry of Health was 600,000,000 S.R. which is about 10% of the health budget. Except for the migrant bedouin population, almost the entire population is covered by primary health care and the essential drugs. However, the bedouin do receive health care when they arrive in a village with a primary health care centre.

9. SOMALIA (Population 3,650,000, Area 638,000 sq.km)

A PHC National Office became operational in 1981 in two regions with assistance from USAID. Programmes began in 5 more regions in 1982 with aid from several agencies, and two more in 1983. (Total nine). All 16 regions should be covered within 1-2 more years. At present the more remote parts of the country receive no drugs.

Most primary health care is provided by community health workers who are usually literate in Somali. They are given short training courses in first aid, community organization, public health, antenatal and obstetric care, common disorders and health education. Antenatal and obstetric care is provided by traditional birth attendants.

The CHW is provided with 17 drugs (21 dosage forms) at the primary health care post while the district health centre and health care units have a list of 40 drugs.

10. SUDAN (Population 22,000,000, Area 2,506,000 sq.km.)

In 1975 Sudan adopted PHC as a national health policy and introduced the community health worker (CHW) chosen by the village councils, as the key provider of health care. They are trained by medical assistants in schools for CHWs. Village midwives work in close collaboration with the CHWs.

Originally, a PHC complex was intended to serve 24,000. The present organization, based on the Sennar Document (Country Statement on Health for All), intends to provide a coverage up to 40%. The CHWs are expected to serve 1000 people. Medical assistants would look after larger villages of 2000 people. The dispensary is the first level of referral for CHWs. Supervision and support would be provided to these levels by physicians working from rural health complexes (hospitals). The total population in such a complex would be about 30,000 people.

A WHO mission in 1981 assisted Sudan in selecting an essential list of 355 items from its previous complement of 950. In 1983 for the first time the Central Medical Stores restricted purchases to this list. The CHW was trained to handle 20 items; but on the recommendations of WHO this list has been reduced to 11 items (dosage forms) including 2 antibiotics, penicillin and sulphadimidine. 43 items at dispensary level, 121 for the health centre and an additional 91 and 59 items for rural and regional hospitals respectively are available.

11. SYRIA (Population 8,980,000, Area 185,180 sq.km.)

Syria has only limited experience in use of a limited drug list in primary health care.

Thirty-three dosage forms are provided for the use of the primary health worker. No antibiotics are included and the emphasis is on prevention and treatment of minor ailments. Drugs are provided for maternal and child health, abdominal discomfort and vomiting, coughs, fever and pain, diarrhoea, skin disorders, eye disorders, intestinal parasites, resuscitation and first aid.

12. YEMEN ARAB REPUBLIC (Population 5,930,000, Area 195,000 sq.km.)

A PHC programme has recently been set up with the aid of WHO and UNICEF. Five Governorates are now covered by 80 permanent health care units and 20 temporary units. The greater part of the country, however, remains without primary health care, and the future of the primary health care programme is not clear. There are many practical problems to be resolved, for example :

1. The same kinds of medicines should be distributed to all health units, based on types of diseases and levels of skill of the health worker.

2. There are no arrangements with the medical supplies department for storage and distribution of drugs.

3. Choice of health worker and birth attendants is difficult because of requirements regarding age and education.

4. At present all drugs used in the PHC programme are donated by WHO and UNICEF and it is not clear how the programme will continue at the end of the two year period.

120 primary health care workers and 20 local birth attendants have been trained under the programme. As there is a scarcity of personnel with general preparatory school certificates, literacy is the key qualification. The health worker must also be a known and acceptable person in the village. He is given six months training by a qualified nurse at the nearest health centre. Local co-operative associations participate in the PHW selection committee.

V. BACKGROUND PAPER FOR SELECTION OF A LIMITED NUMBER OF DRUGS FOR PRIMARY HEALTH CARE PRESENTED BY Dr Vijay Mathur

The world consumption of pharmaceutical products was estimated in the year 1981 at US$ 76.3 billion. Of this 75% was consumed by the industrialized nations and the remaining 25% was for three quarters of the world's population living in the Third World.

The following factors were taken into account when preparing the core list of drugs :

a) Prevalent disease pattern of countries in the Region;

b) Education and training of the personnel responsible for health care delivery;

c) Financial resources of the countries and what is already available to the people.

It was observed that infectious and parasitic diseases were widely prevalent in the Region. In addition, a significant number of people suffered from peptic ulcer, skin and eye infections and accidental poisonings. Three categories of personnel were involved in the drug delivery programme : Grade I workers,(those with education up to class VI and some training); Grade II workers, (with education up to class X or more with variable periods of training), and Grade III workers (medically qualified doctors).

The available data from the countries of the Region revealed that the number of drugs at the PHC level varied from 12 to 110. Vitamins were being widely used. Most of the countries list drugs by their generic names. Sulphonamides and penicillin seem to be the most popular antimicrobials followed by ampicillin, cotrimoxazole, tetracycline, chloramphenicol and streptomycin. Some countries employed antibiotics used systemically for local applications also. They also had a fairly large list of fixed dose formulations. There were instances when similar drugs were used, e.g. a list had sulphadiazine, sulphadimidine and triple sulpha. Obsolete drugs were included in some lists (e.g. coramine, sulphaguanidine). None of the countries had praziquantel or drugs for resistant falciparum malaria on its lists.

The following criteria were followed in drawing up the core list :

a) Three different lists depending on the educational background, i.e. whether the person is (i) educated up to class VI; (ii) educated up to class X; (iii) Doctor.

Whereas the list for grade I should be small, containing only oral preparations, that of grade II could have a limited number of injectables also. For these groups the following should be included :-

---

1 Petel, M.S. Drug costs in developing countries and policies to reduce them, World Development, Volume II, No.3, pp. 195-204, 1983.

A broad spectrum antimicrobial, an analgesic antipyretic, an antacid, an antihaemorrhoidal, a topical fungicide, a local disinfectant for boils and wounds, an anti-allergic, an anti-malarial, an anti-schistosomal, an anti-diarrhoeal, an anti-anaemia, a laxative, anti-scabies and anti-lice, rehydration salts, an anti-spasmodic, an anti-epileptic, a vitamin A preparation, an anti-asthmatic and a preparation for eye infections.

For those countries where doctors are in charge of primary health care a much longer list containing, for example, more antimicrobials, drugs for immunization, for treatment of tuberculosis, leprosy, filariasis, antidotes for poisoning, drugs for hypertension, diabetes, angina and other heart diseases, is required.

b) Drugs should be included by their generic names .

c) The basis for inclusion should be :

i) Country disease profile and availability of funds;
ii) Efficacy of the drug;
iii) Safety of its use;
iv) Cost of a course of treatment and comparative cost;
v) Compliance;
vi) No place for "me too" and "latest drugs" where both efficacy and safety have yet to be established and the cost is exorbitant;
vii) Storage requirements are simple;
viii) Local availability at all times and at reasonable cost;
ix) Inclusion of drugs for schistosomiasis;
x) The list should not have similar drugs, fixed dose formulations, irrational combinations, obsolete and fancy drugs and too many vitamins and tonics.

In the discussion following the presentation, concern was expresed by several participants about allowing health workers to use any of the drugs of habituation or addiction, e.g. codeine, phenobarbitone and diazepam. The majority felt that an alternative to codeine should be chosen for cough and the drug should not be used for diarrhoeas, that phenobarbitone should only be prescribed for epileptics by doctors, and that anxiety states should not be considered such a priority for use of diazepam by the primary health worker (PHW).

There were also widely divergent views on use of antimicrobials by the PHW but it was pointed out that these were already in use in countries by PHWs where doctors were not available at PHC level.

The group recommended the use of drugs such as penicillin and ampicillin by grade II workers after proper training, which should include rational prescribing and highlight the hazards of misuse. The criteria delineated were accepted.

This was followed by the presentation of the tentative list and the description of each drug. After a considerable amount of discussion the group recommended the drugs to be used by the community health worker (Annex V).

With regard to those countries where the PHCs are manned by doctors (grade III) it was suggested that another meeting for this should be convened by WHO and a list of about 80-100 drugs approved for use by doctors. Such a list should also have a drug information sheet as is being prepared for grade I and grade II workers.

The following views were agreed upon :-

i) Antibiotics, kaolin and pectin are not essential for diarrhoeas. Oral rehydration salts only are required.

ii) Concern was expressed about the use of halogenated hydroxyquinolines. Metronidazole is the drug of choice for amoebiasis.

iii) The non-addictive drug noscapine should be used for cough.

iv) Ferrous sulphate to be used in iron deficiency anaemias based on estimating haemoglobin content of the blood.

v) Since sulphacetamide drops were difficult to store and tetracycline eye ointment was equally effective, if not better, it was agreed to include the latter for eye infections.

vi) Mebendazole, although a good drug for round worms, was not ideal for tape worms. A drug like niclosamide should be considered for those countries where such infestation was common.

vii) Although salbumatol was a more specific and rational choice some members felt that another, possibly less expensive alternative, aminophylline, should also be included.

viii) Psychotropic drugs such as diazepam and phenobarbitone should only be used by doctors.

ix) Since lindane is a toxic drug, especially when applied on large surfaces of the body, its use should be restricted to the treatment of lice. Benzyl benzoate should be used for scabies.

The group then discussed in detail the information sheets to be provided to the community health worker for the thirty two drugs included in Lists A and B. Following these discussions the descriptions of some of the drugs were modified. Annex V contains the drug information sheets approved for the thirty-seven drugs.

VI. NEEDS, REQUIREMENTS AND CONSTRAINTS IN THE USE OF A SELECTED LIST OF ESSENTIAL DRUGS AT THE PHC LEVEL, a paper presented by Dr Beily

1. Dr Beily began by noting the different meanings and definitions of primary health care (PHC) and consequently the services offered in the countries represented at the meeting. He stressed that the adoption of PHC as an approach, both conceptually and operationally, as defined in the Alma Ata Declaration, would ensure the establishment of a comprehensive health care delivery system that would facilitate the resolution of the major health problems in any country.

The selection of essential drugs for PHC services in such a system would be an easy and logical step when based on identification of causes and effective remedies of the major health problems. The importance of the managerial process of drug selection was stressed. Data requirement and limitation, the establishment of selection criteria before selecting drugs, and community involvement in the entire process of drug selection were discussed. Factors influencing drug selection at village level were presented.

The fact that drug selection was but one step in the management of drugs - which also involves the determination of quantities, procurement, distribution and the use of drugs - was pointed out. The estimation of requirements should be population based, service based, and based on disease patterns or on consumption patterns over the past years. Ideally all methods should be used. The pros and cons of these different methods were discussed in the presentation. The steps involved in planning for the use of essential drugs at PHC level were outlined.

The constraints that could impede the use of essential drugs at the PHC level were next discussed. Constraints could be of a financial nature, managerial, technical or socio-political. The failure of many countries to put plans into action was stressed; for example non-adherence to an essential list or lack of an active national drug advisory committee. In the presentation it was pointed out that economic, managerial and socio-political constraints are probably the most important at the present time in developing countries.

2. In the discussion which followed, the problem of a career structure for primary health workers was raised. At present there was no career structure, PHWs became frustrated by the lack of advancement and there was now difficulty in recruiting new ones. In one country there was a union of primary health workers, pressing for improvement in employment conditions, including a supervisor grade. It was agreed that solution of this problem was a priority, with perhaps two grades and a special or supervisory grade.

VII.RATIONAL USE OF ESSENTIAL DRUGS AT THE PRIMARY HEALTH CARE LEVEL, a paper presented by Dr Fraser

Dr Henry Fraser presented a paper on the factors contributing to inappropriate drug use and made recommendations for promotion of rational drug use at the primary health care (PHC) level.

1. Historical Background

He gave a brief historical background, outlining the work of the WHO Expert Committee on selection of essential drugs (WHO Technical Report Series No.615) and drawing attention to four of their recommendations which were complementary to the essential drug list. These were :

- drug information;
- education and training in the proper use of essential drugs;
- drug utilization studies;
- research and development in pharmaceutical, clinical and educational aspects of drug use in developing countries.

2. Factors contributing to inappropriate drug use

Effective drug use is only as good as the weakest link on the therapeutic chain which consists of formulary selection committee, supply management, prescribing, dispensing and patient compliance. Problems of inaccurate estimation of requirements occur when only the previous year's purchases are considered. Overpurchase results in wastage and underpurchase in prolonged out-of-stock crises. These are very costly as they result in substitution of more expensive drugs, inappropriate drugs, no treatment at all, patient misunderstanding and referral to special centres or hospital at greater cost.

Sub-standard drugs, purchased at low cost only, may present problems of pharmaceutical inequivalence or instability. Of particular importance are drugs with problems of dissolution, because much quality-control testing has omitted this crucial test, which was only included in the most recent pharmacopeias.

Although the meeting's major concern was drug use by the primary health worker, it must be remembered that in several countries in the Region, primary health care has been provided by doctors working in health centres. A third primary care provider was the pharmacist, who did a great deal of "over-the counter" prescribing in both settings. All three types of personnel could be guilty of bad prescribing practices.

A major problem everywhere was overprescription, especially of multiple medications, unnecessary drugs in self-limiting conditions, e.g. antibiotics, and abuse of vitamins and tranquillisers. Most prescribers fail to modify the dose required according to body weight, old age, nutritional or disease status, but invariably use the standard and often inappropriate adult dose. Longer duration of prescriptions than necessary could be very wasteful, while inadequate instructions could lead to gross misuse of drugs, with no results or even actual harm to the patient.

There is a need to educate patients that vitamins are usually unnecessary and injections not always the best treatment.

There is a major problem of poor compliance in developing countries, but it is important to establish the relevant local factors in every society. An important cause of non-compliance occurs when poor countries change drug suppliers to obtain better prices. The changes in tablet colour, shape and size, especially in the care of drugs for chronic diseases, creates anxiety in the patient and non-compliance, resulting in loss of control.

Dr Fraser proposed a series of suggestions for improving drug use as follows :

a) information and training for health care providers;
b) public health education;
c) drug utilization studies;
d) training of clinical pharmacologists and clinical pharmacists for developing countries.

Further points were emphasized in the discussions that followed this presentation. These were : the need to further evaluate effects of educational efforts on prescribing habits, the need to reach teachers of therapeutics in order to influence the courses they teach, the need to educate the public to be aware of cost factors in prescribing, and the failure in the past to recognize the importance of training pharmacists in PHC approaches.

3. Recommendations

The following recommendations were made by the discussion groups and approved by the meeting :-

3.1. PHW Drug Guide

It is advised that a PHW drug guide be made; it should contain basic information about diseases and drugs.

3.2. Regional Formulary

It is recommended that a Regional Formulary be established, preferably by a regional committee and experts meeting periodically for its revision. The Regional Formulary can be used as a guide for National Formularies.

3.3. Regional Drug Information Centre

It is recommended that a Regional Drug Information Centre be established, with direct links with National Drug Information Centres for dissemination of information.

4. Training for PHWs

Each country must organize courses for PHWs relevant to their local needs which should include understanding of the essential drugs they are going to use. The Regional Office, in collaboration with the competent authorities, should organize seminars/workshops for PHWs locally and invite experts from abroad, if necessary.

5. Training for Pharmacists and Physicians

It is recommended that :-

a) The Regional Office should issue Drug Information Bulletins addressed to each physician and pharmacist in the Region.

b) Individuals should have courses abroad if necessary which will help their understanding in drug use.

c) Training at University level should be re-oriented towards local community needs.

d) As far as possible, prescribing by generic names and concentration should be encouraged.

6. Continuing Education

a) This is essential and should be achieved through seminars and short refresher courses. Incentives should be available for those who take part in such activities.

b) Each Ministry of Health should establish an office which would take over all the responsibility for continuing education.

7. Drug Advertising

It is recommended that drug advertising and promotion be controlled. Advertising of drugs directly to the public should be prohibited.

8. Information about drugs to the Public

The public should be advised not to use drugs without advice, to immediately return to the community health worker or doctor if symptoms persist and to bring back unused medicine to the clinic when they next visit it.

9. The patient should be informed about those side effects which are apt to influence his behaviour, e.g. drowsiness after use of antihistaminics, so that, e.g., he does not drive.

10. The public should be informed about proper storage of drugs, the importance of keeping them out of reach of children and the need to take drugs at the prescribed doses.

11. General information should be provided to the public about the proper use of drugs. Some examples are provided below :-

a) Drugs prescribed for one person should not be passed on to another person.

b) The expiry dates on the drugs should be looked at carefully and observed.

Other points such as the fact that drugs are not always necessary after a visit to a doctor, that inexpensive drugs can be as effective as expensive ones, that all drugs dispensed should be named, and that injections are not necessarily more effective than orally administered drugs, should be continuously brought to the attention of the public.

12. Methods for Education of the Public

The individual education of members of the public should be supplemented by use of posters, handouts, mass media such as radio and television, by the holding of seminars for the public and by health education to children in schools.

13. Educators of the Public

The educators should be, amongst others, the community health worker, physician and pharmacist, religious leaders, village and tribal leaders, elders and teachers.

14. Organizations to be involved in educating the public

These should include the Ministry of Health and all the departments in the Ministry, medical and pharmacy associations, school and university health services, non-governmental organizations including women's and youth organizations, drug committees, clinical pharmacists and clinical pharmacologists, coordinated by Health Education Officers.

15. Drug Utilization Studies

It was strongly recommended that drug utilization studies be conducted on a continuing basis in each country so as to determine prescribing practices and promote national drug use. To this end a research and evaluation unit should be established in the Ministry of Health or an academic centre.

16. There should be a National Drug Advisory Committee which will be responsible for considering the information provided and determining action to improve drug utilization.

17. There should be financial and professional support from WHO to the research and evaluation unit for organizing and conducting research.

18. Training of Clinical Pharmacologists and Clinical Pharmacists

Efforts should be increased, in co-operation with the World Health Organization, to train clinical pharmacologists and clinical pharmacists in each country to play a leading role in National Drug Advisory Committees, in training of medical students, pharmacists and PHWs, in initiating studies of drug utilization and in establishing drug information services.

VIILPROCUREMENT, STORAGE AND DISTRIBUTION OF PHARMACEUTICALS IN PRIMARY HEALTH CARE, Presentation by Mr N. Milner

1. Introducing the subject Mr Milner drew the attention of the meeting to the current facts relating to expenditure on drugs which served the needs of only a proportion of the population. The importance of an efficient logistics system for ensuring the credibility of the health services, and in particular the primary health care concept, was stressed.

The logistics cycle involves the selection, procurement, distribution and use of drugs. There were overall requirements for effective logistics management. The subject was presented under three headings, namely : organization, procurement and distribution.

Each of these topics was covered in detail with emphasis on the need to provide a supply service of quality but at an economic cost. There was a need for qualified and experienced manpower in particular at the decision making levels, that is in managerial and supervisory posts. Nevertheless, training was important for all staff and attention should be given to fulfilling this need.

The status and staffing of the supply service should be at a level which would enhance its prestige and ensure effective communication and co-ordination at all other levels, as well as with senior officials of the Ministry of Health and other ministries or departments which may be involved in the supply services.

An important requirement was an active research unit, responsible for data gathering; its analysis and the provision of information could enable those responsible to make decisions regarding supply management in such areas as drug selection, quantity estimation, supplier selection, storage requirements, distribution mechanisms and financial requirements.

The need for continual monitoring and evaluation of the service provided was underlined. Problem areas should be recognized and dealt with.

The facilities available for the supply services as regards staff, storage space, handling equipment and administrative services often did not meet requirements, primarily because their importance was not recognized and in consequence failed to keep pace with the expansion taking place in other parts of the health services.

Full utilization of all available resources should be made in the operation of drug distribution. The cost/benefit ratio should be carefully assessed in seeking to set up a centralized transport system.

Finance was the determining factor in drug procurement and supply services development; it was necessary that a strong case be made at the highest level to ensure that the financial needs of the health services were fully understood and responded to.

Certain questions were posed, i.e. :

-Which drug ?

-In what quantity?

-From where should drugs be purchased ?

-When should they be purchased ?

-How are they to be handled ?

-Who is to be responsible ?

Present problems were highlighted with possible solutions.

2. Following this presentation Dr Sallami (Democratic Yemen) described briefly the experience of the Central Medical Store, Aden, in computerised store records. He mentioned the facilities available and explained the programmes being used, which covered inventory control, expenditure and the forecasting of drug requirements.

In the discussion which followed several points were emphasized. At present drugs were often purchased but their bioavailability was not made known and they expired before they could be used. Inadequate packaging when dispensed (e.g. in paper envelopes) was a common problem. It was agreed that medical and drug supplies should be run by pharmacists with appropriate training.

3. Recommendations

The following recommendations were made by the discussion groups and approved by the meeting :

(i) There should be a mechanism to ensure effective communication and coordination between the Ministries of Health, Treasury, Trade, Customs and other relevant government ministries, departments and offices, concerning the procurement, importation and distribution of drugs.

(ii) The department of supplies for both medical and non-medical items should be a separate department; its status within the overall organization of the Ministry of Health, as well as that of its senior officials, should be adequate to ensure recognition of its functions. The actual line of authority within the department will be dependent on its administrative structure, which will be a matter for each country to determine.

(iii) The overall stores management and specifically drug supplies should be in the hands of pharmacists; appropriate training should be provided.

Within the supply services a job description must be available for each employee, at all levels, as well as clearly defined areas of responsibility. Discipline should be such as will ensure effective compliance with the administrative structure.

(iv) The procedures to be followed for the procurement, storage and distribution of supplies should be prepared in manual form and made available to each employee.

(v) In the planning and development of the health services adequate provision should be made to ensure that staffing levels, storage facilities, handling equipment, transportation, and office equipment are available at a level which will enable the supply services to operate efficiently.

Particular attention should be given to special storage needs, for example temperature control, at points of importation and throughout the distribution system.

Where geographical conditions, population densities and location of health facilities warrant, regional or zone stores should be provided as part of the distribution network.

The introduction of electronic data processing facilities at the central and regional stores should be actively pursued.

(vi) The administrative procedures introduced should be as simple as possible with a minimum of bureaucracy.

Procedures followed must include effective recording of supplies received and distributed, with adequate feedback and reports from all levels.

(vii)The procurement of drugs should be centralized and tenders called for by this centralized agency. The policy for drug procurement should also be coordinated between all the departments and sectors within a country.

Combined procurement and bulk purchasing by neighbouring countries or groups of countries should be encouraged. WHO should be requested to play an active role in this area through the Action Programme on Essential Drugs.

The use of generic terms in tenders and required product labelling should be encouraged.

(viii)The quality of drug supplies must be assured, and an effective quality control system established from the point of importation, inclusive of local manufacture and throughout the distribution system. Part of the control system would be laboratory facilities for quality assurance. WHO may be requested to increase its assistance in this field.

Drugs procured for the health services should be released for use only after completion of the quality assurance procedures.

(ix) Local production of generic products should be encouraged and where local production exists this should be given every support and perhaps priority in the award of contracts.

(x) The World Health Organization should be requested to continue to make available its expertise in the supply services and to assist countries to organize and develop the supply structure. Other ways by which WHO can help include :-

a. continuing contacts and negotiations with the pharmaceutical industry in obtaining special prices for supplies of essential drugs;

b. providing information on drug sources and prices, the former perhaps by the production and publication of a list similar to that on biological products.

(xi) The World Health Organization should be requested to assist countries in the preparation and conduct of training courses for supply services staff at all levels, and in the production of training manuals. The objective is to ensure adequate levels of trained and experienced manpower with realistic career structures.

Attention must be given also to the inclusion of appropriate training in supply procedure for health workers involved in the ordering, handling and distribution of drugs.

(xii) Those responsible for the supply service must ensure that there is regular and effective supervision so as to monitor the efficiency and effectiveness of the service provided and to evaluate staff performance.

A research unit should be established as part of the supply service to collect and analyse data on drug importation, manufacture, distribution and related aspects and to publish its findings. The unit would also identify constraints and propose action to correct.

(IX & X)TRAINING

Each country presented a short summary of its training of primary health workers.

There was some discussion; views on training of personnel for drug procurement and for primary health care were incorporated in the recommendations of the previous sections. It was agreed that WHO should assist countries in drawing up priorities for resource allocation for improvement of the health status of the community, keeping in mind that emphasis should be placed on the promotive rather than the curative aspects of health.

WHO should also assist in organizing training in local manufacturing skills for the public sector for essential drugs for primary health care.

PREFACE

At the Intercountry Meeting on Essential Drugs for Primary Health Care held at Amman from 26 September till 2 October 1983 the participants identified a core list of essential drugs to be used by the community health worker. They also prepared Drug Information Sheets for all the drugs included in the list. This publication lists the drugs identified for use by the community health worker and presents the Drug Information Sheets.

The proceedings of the meeting will also include the material presented here but it was felt that a separate publication of this type which could be widely disseminated would be of value in countries of the Region where community health workers are providing the first level of primary health care.

ANNEX I

LIST OF PARTICIPANTS

AFGHANISTAN	Dr Habib Dil Department of Pharmacology School of Medicine University of Kabul Kabul
	Dr Shamsulkamar Hashimi Vice President of Basic Health Services c/o Foreign Relations Department Ministry of Public Health Kabul
BAHRAIN	Dr Sousan Mohamed Abbas Acting Chief Pharmacist for Health Centres Ministry of Health Manama
	Miss Thuraya Malallah Saleh Al-Ansari Head of Pharmacy and Drug Control Department Ministry of Health Manama
CYPRUS	Mr E. Kholos Director Pharmaceutical Services Ministry of Health Nicosia
	Dr A. Markides Director Department of Medical Services Ministry of Health Nicosia
DEMOCRATIC YEMEN	Dr Ali Obaid Sallami Assistant Deputy Minister for Pharmaceutical Affairs Ministry of Public Health Khormaksar Aden
DEMOCRATIC YEMEN (continued)	Mr Ali Abdallah Administrative and Financial Secretary Primary Health Care Department Ministry of Public Health Aden

EGYPT	Dr Mohamed El Bayoumi Abdel Kader Hassan General Administration of Pharmacy Director of Scientific Offices Ministry of Health Cairo
	Dr Mohamed Ibrahim M. Ellaithy Deputy Director-General Rural Health Services Ministry of Health Cairo
JORDAN	Dr Suleiman Qubain Director of Primary Health Care Ministry of Health Amman
	Mr Khalil Katawneh Director of Pharmacy & Drug Control Department Ministry of Health Amman
PAKISTAN	Dr Mohammed Zafar Ahmad Assistant Director-General Basic Health Services Special Education & Social Welfare Ministry of Health Islamabad
	Miss Farzana Chowdhary Deputy Drugs Controller Special Education & Social Welfare Ministry of Health Islamabad
SAUDI ARABIA	Dr Hassan Gaznawi Assistant Professor of Community Medicine Deputy Director-General of Health Western Region of Saudi Arabia Directorate of Health Affairs Jeddah
	Dr Othman Rabieah Director Pharmaceutical Affairs Ministry of Health Riyad

SOMALIA	Dr Mohamed Ibrahim Abdi Deputy Director Primary Health Care Ministry of Health Mogadishu
	Dr Ali Sheikh Omar Deputy Director Medical Supplies Department Ministry of Health Mogadishu
SUDAN	Dr Magda Mohamed Ahmed Ali Assistant Director of Primary Health Programme Ministry of Health Khartoum
	Miss Afaf Shakir El Nahas Pharmacist Ministry of Health Khartoum
SYRIA	Dr Hassan Jbeiro Director Pharmaceutical Affairs Ministry of Health Damascus
	Dr Khalid Mardini* Director MCH Ministry of Health Damascus
YEMEN	Dr Mohammed Akabat Director General Supreme Board of Drugs Ministry of Health Sana'a
	Dr Abbas Zabara Assistant Director Primary Health Care Project Ministry of Health Sana'a
OBSERVERS FROM HOST COUNTRY	Dr N. Najib Yarmouk University Amman
	Dr Hanna Hatta Company for Drug Industries and Medical Appliances (ACDIMA) Amman

*Did not attend

WHO SECRETARIAT

Dr R.R. Chaudhury	Regional Adviser, Parmaceutical, Diagnostic and Therapeutic Substances (Secretary)	World Health Organization
Mr N.P.H. Milner	Medical Supply Officer	World Health Organization
Dr Henry Fraser	WHO Consultant	Queen Elizabeth Hospital Bridgetown, Barbados West Indies
Dr V.S. Mathur	WHO Consultant	Department of Pharmacology Postgraduate Institute of Medical Education and Research, Chandigarh 16002 India
Dr Ali Beily	WHO Temporary Adviser	Faculty of Medicine, University of Khartoum, Khartoum, Sudan

Conference Services

Ms A.N. Hetata	Conference Officer	World Health Organization
Mrs M.T. Panayotti	Secretary	World Health Organization

ANNEX II

" بسم الله الرحمـــن الرحيم "

١٩٨٣/٩/٢٦

يسرني أن أفتتح اليوم مؤتمركم عن استعمال الدواء في الرعاية الصحية الأولية بعد يومين من افتتاح مؤتمر تطوير الصحة النفسية الذي يقام أيضا بالتعاون مـــع منظمة الصحة العالمية.

لقد كان الدواء وما زال ركنا أساسيا وهاما في الوقاية والعلاج، يشارك فـــي توصيفه كل فرد واع ذي تجربة ولو محدودة، فالدواء متوفر في الطبيعة حولنا وبيننا بأشكاله المختلفة المركبة منه وغير المركبة، ولا تستأثر فئة على أخرى في وصفـــه أو تركيبه أو صرفه في المجتمعات كلها في العالم. فهناك الأدوية المنزلية الـــتي تعلمت الأم استعمالها من أمها. وهناك الأدوية الشعبية التي توارثها الناس فـــي الاستعمال، أو توصف بواسطة العطارين أو الأطباء الشعبيين. وهناك الأدوية المركبة من الأعشاب الطبيعية، أو المستخرجة منها، أو المصنّعة كيماويا بعد النهضة الكبيرة في علم الكيمياء خلال هذا القرن. كل هذه متوفرة الآن في أكثر دول العالم الثالث والثاني والأول منها.

ومع أن الفرد في دول العالم المتمدّن يستهلك من الأدوية ما تبلغ قيمته مئـــة ضعـــف بالمقارنـــة مع مايستهلك في بعض دول العالم الثالث، الا أن أولويـــات هذه الدول، والرخاء الاقتصادي المتفاوت، والأمراض المعدية في كل منها، ومعـــدلات الحياة فيها تجعل الاهتمام بكمية وطريقة استهلاك الدواء أمرا هاما له آثـــاره الاقتصادية. كما أن ازدياد التعرف على مضاعفات الأدوية وتفاعل بعضها مع بعـــض جعل من مراقبتها وضبط طرق استعمالها واستيرادها أو تصنيعها من أولويات الـــدول الفقيرة أو المتطورة.

وليس بالزمن البعيد عندما كانت في الأردن لائحـــة الأدويـــة المســـتوردة المتداولة التي تزيد على ثلاثة عشر ألـــف صنف تقلصت اليوم بجميـــع أشكالهـــا الصيدلانية الـــى ثلاثـــة آلاف، بفضل المتابعة والمراقبة اللتين تقـــوم بهمـــا اللجـــان المتخصصة، وتشترك فيهما جميع الفعاليات الصيدلانية والطبية في المملكـــة. وعندما نشرت منظمة الصحة العالمية لائحتها بالأدوية الأساسية التي لم تزد عـــن بضع مئات شعر الكثيرون بالراحة والاطمئنان لأن أهم مؤسسة علمية صحية تبنّت هـــذا النهج الصحيح رغم المحاولات المختلفة، والاغراءات التصنيعية لإضعاف هذه السياســـة. ولمّا نادت المنظمة بفلسفة الرعاية الصحية الأساسية وتبنّتها دول العالم كافـــة، كان لا بد وأن يجتمع هذان المفهومان للوصول الى صيغة منطقية مقبولة لصالـــح أكبر عدد من المستفيدين من هذه الرعاية الشاملة.

لقد مرت عدة سنوات هامة على هذا التمازج ، وأصبح من الواضح الآن ضرورة عرض خبرة مختلف الدول في هذا المجال، ووضع أسس للتعامل مع هذه الأدوية الأساسية في مختلف مستويات الرعاية الصحية ، وترشيد استعمالها وطرق خزنها وصرفها ، لأن الكثير من الأوضاع البيئية والمناخية والعادات والتقاليد تتدخل إما سلبا أو ايجابا في مسيرة السياسة الدوائية لبلدان العالم الثالث .

أشكركم وأتمنّى لكم اقامة طيبة في ربوع عمان والأردن، مرحّبا بكم، آملا لكم الوصول الى توصيات بنّاءة فعالة .

" والسلام عليكم ورحمة الله وبركاته "

ANNEX II

Address of H.E. the Minister of Health, Hashemite Kingdom of Jordan
Inter-Country Meeting on Essential Drugs for PHC

I have the pleasure to inaugurate today your Meeting on Essential Drugs for PHC, two days after the inauguration of the Conference on Mental Health Development - both of which are held in collaboration with WHO.

Medication has always been and is still an important cornerstone for disease prevention and treatment, generally prescribed by those who possess knowledge and experience, no matter how limited their share of these may be. Nature around us provides it in abundance, both in its simple and complex forms. In the various societies existing in the world, preparing and dispensing of medication is not confined to one group. There are, for example, the domestic remedies, the use of which is handed down from one generation to another; the traditional remedies, prescribed by herbalists and traditional healers; the medications which are prepared or extracted from natural herbs, and those which are chemically manufactured as a result of the great progress achieved in the field of chemistry during the course of this century. All these are available in most of the countries of the Third, Second and First worlds.

Drug consumption by individuals in the developed countries is one hundred times greater than its equivalent in some of the countries of the Third World. Hence a consideration of priorities in these countries, as well as of such matters as the existing discrepancy in individuals' economic prosperity, the prevalence of infectious diseases, and low life expectancy, render the amount and methods of drug consumption important matters which have their economic impact. Moreover, the increasing awareness of drug interaction and side effects render their monitoring, control of use, importation or production a priority in poor or developing countries..

until recently the list of imported drugs in circulation in Jordan contained over 13 000 drugs which have now been reduced to only 3 000 through the diligent follow-up and control efforts exerted by the specialized committees in which all the Jordanian pharmaceutical and medical authorities take an active part.

When WHO published its essential drug list comprising only a few hundred drugs, many felt relieved that WHO, being the most important health organization, had finally adopted this sound approach, despite the various attempts made by drug manufacturers to weaken this policy. Likewise, when WHO called for the adoption of a PHC policy, all the countries of the world responded positively. Hence it was inevitable to combine these two concepts into an acceptable formula that serves the general interest of the majority.

Now after several years of adopting those two policies, it is essential to review the experience of various countries in this field and to formulate a basis for dealing with these essential drugs, at all health care levels, as well as to rationalize their use, methods of storage and dispensing, taking into account the environmental, climatic and cultural factors which often interfere either positively or negatively in the formulation and adoption of drug policies in the countries of the Third World.

I thank you and wish you a pleasant stay in our Capital and hope that you will reach effective and constructive recommendations.

ANNEX III

بسم الله الرحمن الرحيم

رسالة الدكتور حسين عبد الرزاق الجزائرى
المدير الاقليمى لمنظمة الصحة العالمية لاقليم شرق البحر المتوسط

الى

الاجتماع المشترك بين البلدان
عن العقاقير الأساسية المستخدمة فى الرعاية الصحية الأولية
(عمّان، ٢٦ أيلول/سبتمبر - ٢ تشرين الأول/أكتوبر ١٩٨٣)

انه لمن دواعى سرورى البالغ أن أقدم اليكم جميعا أسمى آيات الترحيب وقد اجتمعتم هنا اليوم لافتتاح هذا الاجتماع المشترك بين البلدان عن العقاقير الأساسية المستخدمة فى الرعاية الصحية الأولية. وأودّ أن أعرب عن شكرى لحكومة المملكة الأردنية الهاشمية الموقّرة لاستضافتها للاجتماع فى عمّان، ولكل ما تسديه من عون ودعم له.

ان الامداد المنتظم ودونما انقطاع لبعض العقاقير المأمونة والفعالة والزهيدة التكلفة فى مستوى الرعاية الصحية الأولية، والوصف الرشيد لهذه العقاقير يعدّان من العناصر الأساسية للاستراتيجية التى ترمى الى تحقيق الصحة للجميع بحلول عام ٢٠٠٠ من خلال أسلوب الرعاية الصحية الأولية. وفى مسعى الى بلوغ هذا الهدف، وتنفيذا لعدة قرارات صدرت عن مختلف دورات جمعية الصحة العالمية، باشرت المنظمة تنفيذ برنامج عمل للعقاقير الأساسية يرمى الى تحديد عدد مختار من العقاقير الأساسية لكل بلد، وتدريب من يقومون بوصفها فى مستوى الرعاية الصحية الأولية على الاستخدام الصحيح لها. ويعتقد أن الاستخدام الرشيد لعدد صغير من العقاقير من شأنه أن يحد من استخدامها دونما تمييز أو ضرورة، وأن يخفض النفقات التى تنفقها كل عائلة وبلد على العقاقير، وكذلك يخفض عدد الكائنات التى تكتسب مقاومة للعقاقير الحديثة ولا سيما المضادات الحيوية. غير أنه من الضرورى لنجاح هذا البرنامج فى قصر استخدام العقاقير على عدد صغير منها، أن تكون هذه العقاقير متاحة فى الواقع، وألا تتعطّل اجراءات التوريد والتخزين والتوزيع على وحدات الرعاية الصحية الأولية. وقد تبين من تجربة عدة بلدان أن ثقة السكان

واطمئنانهم فيما يتعلق بالحصول على الخدمات في مستوى الرعاية الصحية الأولية يتضاءل وينعدم ان اذا كان في انتظار المرضى أرفف خالية من الأدوية، وكانوا هم غير قادرين على الحصول على احتياجاتهم في مستوى الرعاية الصحية الأولية.

وعلى ذلك فمن المهم بالنسبة للحلقات الثلاث المتعلقة بعنصر العقاقير الأساسية في مستوى الرعاية الصحية الأولية أن تنشأ مع بعضها البعض بحيث تكمّل بعضها البعض، وهذه الحلقات هي: (أ) اختيار عدد من العقاقير الأساسية (ب) تدريب العاملين في مجال صحة المجتمع على الاستخدام والوصف المناسبين لهذه العقاقير (جـ) اقامة نظام للتوزيع الفعال للعقاقير في مستوى الرعاية الصحية الأولية. ويسرني أن أعلم أنكم تزمعون مناقشة هذه الموضوعات الثلاثة جميعها خلال الأسبوع القادم.

وقد قام أحد عشر بلدا من بلدان الاقليم فعلا باعداد قوائم بالعقاقير اللازم استخدامها في مستوى الرعاية الصحية الأولية، وهي تتراوح بين اثني عشر عقّارا ومائة وعشرة عقاقير. وهذا التباين في عدد العقاقير المستخدمة يعكس نوع من يقدمون الرعاية الصحية الأولية في البلدان. ففي عدّة بلدان بالاقليم يمثل الطبيب نقطة الاتصال الأولى في مجال الرعاية الصحية، ومن ثم فان هناك عددا أكبر من العقاقير التي يستخدمها. وسوف يكون من المفيد جدا تقاسم الخبرات بين المشتركين من مختلف البلدان بشأن استخدام عدد محدود من العقاقير في مستوى الرعاية الصحية الأولية. ويؤمل أن تتمكنوا من تحديد قائمة بالعقاقير التي يمكن أن تسترشد بها البلدان في اختيار العقاقير التي تستخدم في تقديم الرعاية الصحية الأولية. وبالطبع فان العقاقير ستتباين بدرجة محدودة، نظرا للاختلافات في أنماط المرض في البلد.

كذلك فان تدريب العاملين في مجال صحة المجتمع يحظى بالأهمية، والا فان العقاقير الأساسية المتاحة في مستوى الرعاية الصحية الأولية ستستخدم بشكل غير ملائم وتبدّد. وخلال هذا الاجتماع سوف يطلب اليكم أن تراجعوا وصفا موجزا أعدّ لثمانية وثلاثين عقّارا. وهذه المعلومات يقصد بها العامل في مجال صحة المجتمع، ويجب اتاحتها في المركز الصحي في جميع الأوقات. وفي نهاية الأسبوع آمل أن تكونوا قد قمتم بمناقشة الوصف الخاص باستخدام هذه العقاقير، وتعديله، واقراره. وسوف نشرع بعد ذلك في ترجمة المواصفات، ونشر ما بها من معلومات. وآمل أيضا أن تتدارسوا فيما يمكن اتخاذه من مبادرات أخرى من قبل منظمة الصحة العالمية في مجال تدريب العاملين في مجال صحة المجتمع. وقد اقترح اعداد دليل مبسّط عن التشخيص والعلاج بحيث يكون مكمّلا

لهذا الكتاب الخاص بالعقاقير. وهذه النقاط لكم أنتم لكي تتخذوا قرارا بشأنها، وانني أتطلع الى ما ستصدرونه من توصيات في هذا الخصوص.

ان توريد العقاقير وتخزينها وتوزيعها في مجال الرعاية الصحية الأولية - وهو ما يمثل الحلقة الثالثة التي ذكرتها في هذه السلسلة - سيكون بدوره محل مناقشتكم. فجميعكم على علم بالمشكلات والمعوقات التي تصادف في هذا المجال. وقد تغلبنا على الصعوبات التي تنجم أحيانا عن نقص العقاقير في مستوى الرعاية الصحية الأولية، بينما تعيّن في أوقات أخرى اتلاف بعض العقاقير لعدم استخدامها مع حلول تاريخ انتهاء صلاحيتها. وفي ظل الخبرة الهائلة الممثلة في هذا الاجتماع فانكم سوف تتولون وضع ارشادات محددة بشأن كيفية ضمان انتظام الامدادات من العقاقير بدون انقطاع حتى في المناطق النائية من بلدانكم. فليست هناك أية فائدة من اختيار عقاقير أساسية، وتدريب أشخاص على استخدام هذه العقاقير، اذا لم تكن هناك أية عقاقير تستخدم في مختلف الأوقات.

ومن المؤسف حقا أن بعض البلدان التي تفتقر الى الموارد بشكل حاد تعاني أكثر من غيرها من تبديد للعقاقير والانفاق عليها بغير داع. وسوف تبذل منظمة الصحة العالمية جل ما في وسعها من أجل التعاون مع الحكومات في معالجة هذا الوضع السيئ. وما هذا الاجتماع سوى واحد من عدة أنشطة استهلتها المنظمة للتعاون مع الحكومات في مجال العقاقير والمواد الصيدلية. وهناك أنشطة أخرى تشمل تعزيز القدرات القومية في مجال تنظيم العقاقير، وانشاء شبكة للمراكز الخاصة بمراقبة نوعية العقاقير، ونشر المعلومات الموضوعية غير المتحيّزة عن العقاقير، والبدء في دراسات عن استخدام العقاقير، وتدريب جميع فئات العاملين المشتركين في استخدام العقاقير، بما في ذلك اقامة مراكز للدوائيات السريرية أي الفارماكولوجيا الاكلينيكية. كذلك فاننا نتعاون مع الحكومات في تعزيز وتحديث التشريعات واللوائح الدوائية كلما دعت الحاجة الى ذلك.

ولم يعد ثمة ما أقوله غير أن أتمنى لكم اجتماعا مكللا بالنجاح التام، كما أنني أتطلع الى نتائج الاجتماع والتوصيات التي ستصدر عنكم. وانني أزجي لكم الشكر لقبولكم دعوتنا لكي تكونوا معنا هذا الأسبوع، كما أود أن أعرب مجددا عن عميق شكرنا لحكومة المملكة الأردنية الهاشمية الموقّرة لاستضافتها هذا الاجتماع.

والسلام عليكم ورحمة الله وبركاته،،

Annex III

MESSAGE FROM DR HUSSEIN A. GEZAIRY
DIRECTOR
WHO EASTERN MEDITERRANEAN REGION
INTERCOUNTRY MEETING ON ESSENTIAL DRUGS
FOR PRIMARY HEALTH CARE

Amman, 26 September to 2 October 1983

It gives me great pleasure to extend a warm welcome to all of you who have assembled here today for the inauguration of the Intercountry Meeting on Essential Drugs for Primary Health Care. I would like to express my gratitude to the Governement of Jordan for hosting the meeting at Amman and for all the help and assistance they are providing.

The regular uninterrupted supply of a selected number of safe, effective and cheap drugs at the primary health care level and rational prescribing of these drugs is one of the essential components in the strategy evolved for achieving Health for All by the Year 2000 through the primary health care approach. In pursuance of attaining this objective, WHO launched, in response to several resolutions at different World Health Assemblies, the Action Programme on Essential Drugs which aims at identifying a selected number of basic drugs for every country and then training the prescribers of the drugs at the primary health care level in proper use of such drugs. It is felt that rational use of a few drugs would reduce indiscriminate and unnecessary use, would decrease the expenditure incurred by the individual family and the country on drugs and would also reduce the number of organisms becoming resistant to the modern drugs - particularly antibiotics. It is essential, however, for the success of this programme of limiting the use to a few drugs that these drugs are, in fact, available and that the logistics of procurement,storage, supply and distribution of drugs to the primary health care complex does not break down. Experience in several countries has demonstrated that the confidence and faith of the population in obtaining services at the primary health care level becomes eroded and broken if patients are faced with empty shelves of medicines and are not able to obtain their requirements at primary health care level.

It is important, therefore, that the three links of essential drugs component of primary health care are all developed together, each complementing the other. These are (a) the selection of a number of basic or essential drugs, (b) training the community health workers for proper use and prescribing of these drugs and (c) development of a system for efficient distribution of drugs at the primary health care level. I am pleased to see that all these three subjects are to be discussed by you in the coming week.

Eleven countries in the Region have already identified lists of drugs to be used at the primary health care level. These vary from twelve to one hundred and ten. This variation in the number of drugs being used reflects the type of person delivering primary health care in the countries. In several countries in the Region the first contact for health care is a doctor and so the number of drugs used by him is greater. The sharing of experiences of the different participants of the countries in the use of a limited number of drugs for primary health care will be most valuable. It is hoped that you will be able to identify a list of drugs that could serve as a guide to countries selecting drugs for use for delivery of primary health care. Naturally the actual drugs would vary a little due to the differences in disease patterns in countries.

Training of community health workers is important as otherwise those essential drugs available at the primary health care level would be wastefully and inappropriately used. During this meeting you will be asked to review a short description of thirty eight drugs that has been prepared. This information is meant for the community health worker and should be available at all times at the health centre. I hope that by the end of the week you will have discussed, modified and adopted the description regarding use of these drugs. We shall then proceed to translate the descriptions and disseminate the information contained therein. I hope that you will also consider what further initiatives could be taken by the World Health Organization in the training of community health workers. It has been suggested that a simple manual on diagnosis and treatment should complement this book on drugs. These are points for you to decide and I look forward to your recommendations.

The procurement, storage and distribution of pharmaceuticals in primary health care - the third link that I have mentioned in this chain - will also be discussed by you. All of you are familiar with the problems and constraints in this area. We have to overcome the difficulties that result sometimes in lack of drugs at the primary health care level while at other times drugs have to be destroyed because they have not been used and they have reached the expiry date specified for their use. I hope that, with the tremendous experience and expertise represented at this meeting, you come up with specific guidelines as to how regular, uninterrupted supplies for drugs to even the remotest areas in your countries could be ensured. There is hardly any use in going through the selection of essential drugs and training persons to use these drugs if there are, at different times, no drugs to be used.

It is indeed unfortunate that in some of the countries where resources are most lacking, the wastage and unnecessary expenditure on drugs is greatest. The World Health Organization will do everything it can to collaborate with governments to deal with this unsatisfactory situation. This meeting is only one of several activities initiated by the World Health Organization in working with governments in the field of drugs and pharmaceuticals. Other activities include strengthening national capabilities in drug regulation, development of a network of drug quality control centres, publication of objective unbiased information about drugs, initiation of studies in drug utilization and training of all categories of personnel involved in the use of drugs including development of centres of clinical pharmacology. We are also collaborating with governments in strengthening and updating drug legislation and drug regulations whenever needed.

It remains now for me only to wish you a very successful meeting and to say that I am looking forward to the outcome and your recommendations. I thank you for accepting our invitation to be with us this week and would, once again, like to express our gratitude to the Government of Jordan for hosting this meeting.

ANNEX IV

PROGRAMME

Monday, 26 September 1983

08.30 - 09.00	- Registration
09.00 - 09.30	- Opening Session, Plenary
	- Inaugural Address by H.E. Dr Zohair Malhas, Minister of Health
	- Message from Dr Hussein A. Gezairy, Director, WHO Eastern Mediterranean Region
09.30 - 10.00	- Recess
10.00 - 14.00	- Election of Officers (Chairman, Vice-Chairman, Rapporteur)
	- Adoption of the Agenda
	- Presentation of Country Experience in use of a limited number of drugs for primary health care - Plenary (Agenda Item 2 & 3)

Tuesday, 27 September 1983

08.30 - 10.30	- Identification of a core list of drugs for use at the primary health care level - Plenary (Agenda Item 4)
	- Consideration of the description of each of the selected drugs to be provided to the community health worker - Plenary (Agenda Item 5)
10.30 - 11.00	- Recess
11.00 - 13.00	- Group discussions on selection of drugs to be used at different levels of the primary health care system
	- Group discussions on the description of each drug to be provided to the community health worker
13.00 - 14.00	- Presentation of the recommendations of the different groups - Plenary

Wednesday, 28 September 1983

08.30 - 09.30	- Needs, requirements and constraints in the use of a selected number of essential drugs at the primary health care level - Plenary (Agenda Item 3 and 6)
09.30 - 10.30	- Rational use of essential drugs at the primary health care level - Plenary (Agenda Item 7)
10.30 - 11.00	- Recess
11.00 - 13.00	- Group discussions on use of drugs at the primary health care level
13.00 - 14.00	- Presentation of recommendations of the different groups - Plenary

Thursday, 29 September 1983

08.30 - 10.30	- The procurement, storage and distribution of pharmaceuticals in primary health care- Plenary (Agenda Item 8)
10.30 - 11.00	- Recess
11.00 - 13.00	- Group discussions on logistics of procurement, storage and distribution of pharmaceuticals to the primary health care level
13.00 - 14.00	- Presentation of the recommendations of the different groups

Saturday, 1 October 1983

08.30 - 10.30	- Country Presentations on level and background of the community health worker distributing drugs at the primary health care level and training being provided - Plenary (Agenda Item 9)
	- Discussion on training needs for personnel involved in procurement, storage, distribution and use of drugs - Plenary (Agenda Item 10)
10.30 - 11.00	- Recess
11.00 - 14.00	- Visit to the Drug Quality Control Laboratories, Amman

Sunday, 2 October 1983

08.30 - 10.30	- Summary Report and Recommendations (Agenda Item 11)
10.30 - 11.00	- Recess
11.00 - 13.00	- Adoption of the Report
13.00 - 14.00	- Closing Session (Agenda Item 12)

ANNEX V

1. CORE LIST OF DRUGS FOR USE BY COMMUNITY HEALTH WORKERS

LIST A

For those centres where the drugs would be given by Grade I Health Workers (educated up to class VI at least).

1. Acetylsalicylic Acid.
2. Aluminium hydroxide (o)
3. Antihaemorrhoidal drug (o)
4. Benzoic acid + Salicylic Acid.
5. Chlor-hexidine.
6. Chlorpheniramine. (o)
7. Chloroquine.
8. Ferrous sulphate.
9. Gentian violet.
10. Ispagula husk/Senna.
11. Lindane/Benzyl benzoate.
12. Mebendazole/Piperazine.
13. Noscapine.
14. Oral rehydration salts.
15. Paracetamol.
16. Praziquantel/Metrifonate.
17. Retinol.
18. Salbutamol/Aminophylline.
19. Sulphadimidine. (o)
20. Tetracycline eye ointment.

Drugs followed by the symbol (o) are examples of a therapeutic group; select any member based on availability and comparative cost.

LIST B

For those centres where the drugs would be administered by Grade II workers (educated up to class X or more and adequately trained).

1. Acetylsalicylic acid.
2. Activated charcoal.
3. Adrenaline injection.
4. Aluminium hydroxide. (o)
5. Ampicillin.(*)
6. Antihaemorrhoidal drug.(o)
7. Benzoic acid + Salicylic acid.
8. Calamine lotion.
9. Chlorhezidine.
10. Chlorpheneramine.(o)
11. Chloroquine.
12. Ergometrine.
13. Ferrous sulphate.
14. Gentian violet.
15. Iodine.
16. Ipecacuanha.
17. Ispagula husk/Senna.
18. Lindane/Benzyl benzoate.
19. Mebendazole/Piperazine.
20. Metronidazole.
21. Noscapine. (o)
22. Oral rehydration salts.
23. Oxyphenonium bromide.(o)
24. Paracetamol
25. Penicillin - Pen. V. and Procaine Penicillin injection.
26. Praziquantel/Metrifonate.
27. Promethazine.
28. Retinol.
29. Salbutamol/Aminophylline.
30. Sulphadimidine. (o)
31. Tetracycline eye ointment.
32. Trimethoprim.

Drugs followed by a the symbol (o) are examples of a therapeutic group; select any member based on availability and comparative cost.

(*) Ampicillin is a safe and useful drug but can cause hypersensitivity reactions; avoid its use in subjects giving history of reaction to the penicillin group.

Those drugs underlined are recommended only for Grade II workers.

2. THERAPEUTIC INDEX OF DRUGS

Indications - Symptom/Disease Information	Drug	Sheet Number
Allergy		
(a) Hayfever, Urticaria	Chlorpheneramine	1
(b) Severe life-threatening	Adrenaline	2
Amoebiasis	Metronidazole	3
Anaemia	Ferrous Sulphate	4
Anal Fissure	Ispagula husk	5
Asthma	Aminophylline	6
	Salbutamol	7
Constipation	Ispagula husk	8
	Senna	
Cough	Noscapine	9
Dehydration	Oral rehydration salts	10
Disinfection of skin :		
cuts and wounds	Chlorhexidine	11
	Gentian violet	12
	Iodine	13
Eye infections	Tetracycline eye ointment	14
Fever	Acetylsalicylic acid	15
	Paracetamol	16
Fungal infection of skin	Benzoic Acid + salicylic acid	17
Giardiasis	Metronidazole	3
Gut cramps or Colicky Pain	Oxyphenonium	18
Haemorrhoids (Piles)	Antihaemorrhoid suppository or cream	19
Indigestion, heartburn	Aluminium Hydroxide	20
Infection and Fever	Ampicillin	21
	Trimethoprim	22
	Penicillin	23
	Sulphadimidine	24

3. ALPHABETICAL LIST OF DRUGS IDENTIFIED FOR USE BY THE COMMUNITY HEALTH WORKER

	Drug Information Sheet Number
Acetyl salicylic acid	15
Activated charcoal	25
Adrenaline	2
Aluminium Hydroxide (o)	20
Aminophylline	6
Ampicillin	21
Antihaemorrhoidal drug (o)	19
Benzoic acid + Salicylic acid	17
Benzyl benzoate	27
Calamine Lotion	35
Chlorhexidine	11
Chlorpheniramine (o)	1
Chloroquine	28
Ergometrine	36
Ferrous Sulphate	4
Gentian violet	12
Iodine	13
Ipecacuanha	37
Ispagula husk	5
Lindane	26
Mebendazole	31
Metrifonate	33
Metronidazole	3

1. Drugs followed by the symbol (o) are examples of a therapeutic group. Select any drug of the group based on availability and cost

2. Those drugs underlined are recommended for use only by community health workers educated up to Class X. The others could be used by those educated up to Class VI.

ANNEX VI

DRUG INFORMATION SHEETS

FOR

USE OF THE COMMUNITY HEALTH WORKERS

WORLD HEALTH ORGANIZATION

REGIONAL OFFICE FOR THE EASTERN MEDITERRANEAN

1983

NAME OF THE DRUG

Chlorpheniramine

INDICATIONS

Allergy, Urticaria, Hayfever

DRUG SUMMARY

A prototype of antiallergic drug, calms and prevents allergic reactions such as itchy rashes or lumps on the skin, hives, hay fever. All antihistamine drugs have a varying degree of sedation (sleepiness). Chlorpheniramine is a potent drug and has low sedation. Therefore recommended for day-time use.

DOSAGE FORMS, STRENGTH

Tablet - 4 mg.

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults : 1 tablet

Children : Under 12 years 1/2 tablet
Babies 1/4 tablet

Directions : To be taken up to three days.

PRECAUTIONS

All antihistamines cause drowsiness and dulling of mental alertness so the user should not be entrusted to drive an automobile or work on machinery where loss of attention may lead to accident.

ADVERSE EFFECTS

May experience sedation, dizziness, fatigue, dry mouth and throat. Most of these disappear on continued use. Prolonged use can harm the blood cells.

INTERACTIONS

Enhances the sedative effect of drugs like diazepam, phenobarbitone and alcohol.

DIRECTIONS FOR STORAGE

Store in airtight containers, protect from light.

NAME OF THE DRUG

Adrenaline

INDICATIONS

Severe life-threatening allergic reaction

DRUG SUMMARY

Adrenaline injection must be given at once if a person has severe reaction to drugs like penicillin. The drug should be injected subcutaneously. The drug dramatically reverses the fainting attack and breathing difficulty.

DOSAGE FORMS, STRENGTH

Ampoules 1 mg/ml

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults	:	0.2 0.5 ml subcutaneously
Children	:	4-12 years 1/3 ml subcutaneously 1-6 years 1/4 ml subcutaneously Under 1 year DO NOT USE
Directions	:	If required, a second dose can be given after 1/2 hour. Do not give more than 3 doses. If the pulse goes up by 30 or more beats after the first injection - do not repeat.

PRECAUTIONS

Do not give more than the recommended dose at a time. The injection should be, subcutaneous.

ADVERSE EFFECTS

Overdosage may cause cardiac arrhythmias, cerebral haemorrhage and pulmonary oedema.

DIRECTION FOR STORAGE

Store in airtight containers, protect from light. Do not use the ampoules if the solution is pink.

NAME OF THE DRUG

Metronidazole

INDICATIONS

Amoebiasis & Giardiasis

DRUG SUMMARY

The most significant advance in the treatment of amoebiasis has been theintroduction of metronidazole, a drug useful in all types of amoebiasis.The drug has a bitter, slightly saline taste. The benzoyl salt which isused for children is tasteless. Metronidazole is also used in giardiasis,trichomonas vaginalis and for infections due to anaerobic bacteria.

DOSAGE FORMS, STRENGTH

Tablets - 200 mg/250 mg; 400mg. Syrup 10 mg/5ml.

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

		For Amoebiasis		For Giardiasis	
Adults	:	750 - 800 mg	Three times a day for 10 days	200 mg	Three times a day for 5 days
Children	:	8-12 years - 400 mg		200 mg	
		4- 7 years - 300 mg		200 mg	
		2- 3 years - 200 mg		100 mg	
		Under 2 years - 80-110 mg		50 mg	

Directions : Give a course; repeat if required after 4-6 weeks.

CONTRAINDICATIONS

First trimester of pregnancy, nursing mothers; persons with active brain disease; those with blood disease.

PRECAUTIONS

Avoid alcoholic beverages during therapy with metronidazole.

ADVERSE EFFECTS

Frequently seen are nausea, headache, dry mouth, metallic taste. These rarely need interruption of therapy. Dizziness, vertigo, numbness and parasthesia may occur.

INTERACTIONS

Metronidazole interacts with alcohol and produces abdominal discomfort, vomiting, or headache. It enhances the anticoagulant effect of warfarin.

DIRECTIONS FOR STORAGE

Keep in airtight containers, protect from light and moisture.

NAME OF THE DRUG

Ferrous Sulphate

INDICATIONS

Anaemia

DRUG SUMMARY

The treatment of choice is orally administered ferrous sulphate which is also the least expensive preparation. Dosage should always be calculated on the basis of elemental iron present (daily requirement in uncomplicated iron deficiency anaemia is 100 mg). Other salts such as ferrous fumarate, gluconate, succinate and combination with Vit. C., succinic acid, copper and manganese do not offer any advantage except substantial increase in cost. Add folic acid - 5 mg tablet/day in deficiency anaemia due to deficiency in folic acid and iron.

DOSAGE FORMS, STRENGTH

Tablets usually containing 200, 300, 325 mg salt (40, 60, 65 mg, iron)
syrup 40 mg salt/ml (8 mg iron).

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults	:	Usual dose 2-3 mg/kg/day	) 400-600 mg/day)
Children	:	Weighing 15-30 kg : half adult dose Smaller children and infants-5mg/kg	) 200 mg/mg/day)

Note that dosage should be calculated on basis of elemental iron.

Directions : To be taken after meals to reduce gastric upsets.

CONTRAINDICATIONS

In anaemias not due to iron deficiency.

PRECAUTIONS

Keep away from children. The sugar-coated iron tablets could be mistaken for sweets.
N.B. As little as 1 g can cause death.

ADVERSE EFFECTS

Gastric symptoms, heartburn, nausea, upper gastric discomfort, constipation - most are of psychic origin. These are not related to the salt used but to the content of elemental iron.

INTERACTIONS

Interaction with tetracycline; reduce serum level of each. There is also reduced iron absorption with antacid.

DIRECTIONS FOR STORAGE

In airtight containers; protect from light and moisture.

NAME OF THE DRUG

Ispagula

INDICATIONS

Constipation, Haemorrhoids and Anal Fissure

DRUG SUMMARY

A mucilaginous substance obtained from plant source. Although pharmacologically inert, when taken orally absorbs water, increases the bulk which results in large, soft stools. Patients with haemorrhoids and anal fissure also get relief. A safe and effective remedy.

DOSAGE FORMS, STRENGTH

Husk, powder, sachets containing drug granules (6.4 g).

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults	:	Husk - 3-5 g) 2 teaspoonfuls once a day Powder - 3-15 g) Sachet - 6.4 g - one sachet
Children	:	1 teaspoonful of husk or powder or 1/2 sachet once a day.
Directions	:	Soak the dose in a cup of water, stir briskly and drink at once. Follow it up with a glass of water. Should be taken around 4 p.m. for action next morning.

CONTRAINDICATIONS

NIL

PRECAUTIONS

To be taken with plenty of water.
To be used with care in diabetic patients.

ADVERSE EFFECTS

Extremely rare; slight abdominal discomfort and flatulence.

INTERACTIONS

NONE WORTH RECORDING.

DIRECTION FOR STORAGE

In a cool place in airtight containers.

NAME OF THE DRUG

Aminophylline (Theophylline)

INDICATIONS

Bronchial Asthma

DRUG SUMMARY

The most important action of aminophylline is its ability to relax the smooth muscle of the bronchi which are constricted in asthma, thus relieving the difficulty in breathing. It is therefore a valuable drug in the treatment of bronchial asthma.

DOSAGE FORMS, STRENGTH

Tablets 100 mg, 200 mg.

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults	:	200 mg (2 tablets 100 mg each) every 8 hours.
Children	:	7-12 years - 100 mg every 8 hours. 1- 6 years - 50 mg every 8 hours. Up to 1 year- 12.5-25 mg every 8 hours.

CONTRAINDICATIONS

Not to be used in individuals who are allergic to it.

PRECAUTIONS

Children are particularly susceptible to the drug. Do not repeat more frequently than 8 hourly intervals.

ADVERSE EFFECTS

May cause gastric irritation, nausea and vomiting.

DIRECTIONS FOR STORAGE

Store in well-filled airtight containers, protect from light.

NAME OF THE DRUG

Salbutamol

INDICATIONS

Bronchial Asthma

DRUG SUMMARY

Salbutamol gives relief to a patient of bronchial asthma by opening up the tubes leading to the lungs so that air can pass more easily. The advantage over isoprenaline is that this drug has maximum effect on the bronchial tubes and minimal on heart. One should use the smallest dose giving relief.

DOSAGE FORMS, STRENGTH

Tablet 2-4 mg; Syrup 2 mg/5 ml.

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults : 2-4 mg; 3 to 4 times a day
Give the lower dose of 2 mg in elderly patients.

Children : Older children 2 mg four times a day
2 - 6 years - 1 to 2 mg four times a day.

Directions : Use the smallest dose giving relief.

CONTRAINDICATIONS

High blood pressure, serious diseases of the heart, diabetics.

PRECAUTIONS

In asthmatic patients when condition worsens, increase the dose (not exceeding 8 mg). Refer him to the doctor who would add steroid or any other drug.

ADVERSE EFFECTS

Fine tremors of hand, palpitation, tension, headache. The patient should be warned about these.

INTERACTIONS

The effect is enhanced when aminophylline is given simultaneously.

DIRECTIONS FOR STORAGE

Keep in airtight containers, protect from light.

NAME OF THE DRUG

Senna

INDICATIONS

Constipation

DRUG SUMMARY

A drug introduced in Arabian medicine in ninth century A.D. obtained from the pods and leaves of the plant Cassia acutifolia or Cassia augustifolia. The drug produces a single thorough evacuation of bowel after 6 hours and so should be given at bedtime. The preparation from pods is more reliable and stable. One can use the active principles sennoside A+B or granules.

DOSAGE FORMS, STRENGTH

Senna tablets (Sennosides) 7.5 mg.

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults : 2-3 tablets at bedtime for a maximum of 4 daily or 1-2 teaspoonfuls of granules at bedtime for a maximum of 4 days' duration.

Children : 8-13 years. 1 tablet at bedtime or 1/2 teaspoonful of granules for a maximum of 4 days' duration.

Directions : The patient should be advised to eat more green vegetables, fruit and cereals containing fibre and should drink enough water.

CONTRAINDICATIONS

Not to be used if the patient has severe stomach pain, nausea, vomiting or if he is dehydrated. Do not use in a child who is dehydrated or has high fever.

PRECAUTIONS

Do not allow the laxative use to become a habit. Advise on importance of diet, regular bowel habits and exercise.

ADVERSE EFFECTS

Mild griping may occur.

DIRECTIONS FOR STORAGE

In airtight containers; protect from light.

NAME OF THE DRUG

Noscapine

INDICATIONS

Dry Cough

DRUG SUMMARY

A naturally occurring alkaloid obtained from opium. A potent cough suppressant agent useful in the treatment of dry cough. Its mild respiratory stimulant and bronchodilator properties are also helpful in the treatment of cough. Although obtained from opium it does not have any action on pain nor does it produce sedation. It does not produce euphoria nor does its use lead to dependence.

DOSAGE FORMS, STRENGTH

Noscapine hydrochloride or noscapine tablet 15 mg. or as noscapine linctus in combination with antihistamine

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults : 15-30 mg three times a day.

Children : 7-12 years - 7.5-15 mg. three times a day
1- 6 years - 4.0-7.5mg. three times a day
Below 1 year- 2-4 mg. three times a day

PRECAUTIONS

Do not give more than 300 mg drug in 24 hours (for both adults and children).

ADVERSE EFFECTS

Slight drowsiness, dizziness, headache, nausea and rarely skin rash.

DIRECTIONS FOR STORAGE

Store in air-tight containers; protect from light, heat and moisture.

NAME OF THE DRUG

Oral Rehydration Salts (ORS)

INDICATIONS

Rehydration

DRUG SUMMARY

Contains sodium chloride, sodium bicarbonate, potassium chloride, glucose and water. Sodium chloride is the principal salt involved in the maintenance of osmotic tension of blood and tissue. In cases of severe diarrhoea with or without vomiting the body loses more water and electrolytes than are taken. The patient with dehydration passes no or little urine of dark yellow colour, has sudden weight loss, dry mouth, weak pulse and may have convulsions. Small children and malnourished children develop dehydration more quickly.

DOSAGE FORMS, STRENGTH

In packets for making 1 litre. Smaller packets for 250 ml are also available.

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults	:	3 or more litres	)
			) Give the patient sips
Children	:	1 litre in 8-24 hours	) of this every 5 minutes
Infants	:	1 litre in 24 hours	)

DIRECTIONS

Dissolve the contents in sterile boiled and cooled water.

PRECAUTIONS

For those who cannot retain the ORS and vomit it out give intravenous solution. In wellnourished children do not continue for more than 24 hours; can cause excessive levels of sodium and potassium in blood.

DIRECTIONS FOR STORAGE

Store packets in a cool and dry place. The prepared solution should not be stored for more than 24 hours.

NAME OF THE DRUG

Chlorhexidine

INDICATIONS

Disinfectant for superficial wounds and infection

DRUG SUMMARY

Destroys the cell membrane of bacteria causing infection. Negligible amounts are absorbed from skin so no systemic toxicity. Used for the preoperative preparation of the doctor (handwash and scrub) and patient (skin). Useful in the treatment of superficial infections and wounds. Also used as a mouth wash for aphthous ulcers and prevention of dental caries.

DOSAGE FORMS, STRENGTH

Aqueous emulsion 4%. Aqueous solution 1% mostly as gluconate and sometimes as acetate.

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults	: 1) For preoperative disinfection of skin.	0.5% solution in 70% alcohol.
	2) For wound disinfection	0.05% aqueous solution
	3) For catheter lubrication	0.05% solution in glycerol
	4) Obstetrics	1% cream
	5) For surgical instruments sterilization and storage	0.02% solution + Sodium nitrate 1%
	6) Skin disinfection	0.01% solution

PRECAUTIONS

Bottles containing cork lining should not be used, as cork inactivates it. If syringe and needle required for spinal injection, rinse thoroughly with water before injection.

ADVERSE EFFECTS

Rarely skin sensitivity may occur.

INTERACTIONS

Incompatible with soaps and salts containing borates, bicarbonates, phosphates and sulphate.

DIRECTIONS FOR STORAGE

Store in a cool place in an airtight container; protect from light.

NAME OF THE DRUG

Gentian Violet

INDICATIONS

Local antinfective

DRUG SUMMARY

A dye, available as dark blue crystals. Solubility 1 in 200 in water, 1 in 30 in glycerol and very soluble in alcohol. The solution is used for the treatment of superficial skin infections, boils and sores with pus. It can also be used for treating thrush or yeast infection in mouth, vulva. Also applied on skin folds and burns.

DOSAGE FORMS, STRENGTH

Bottle - 25 g; 0.5 - 2% solutions for local application.

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults : Only for local application.
For mouth and vulva - 0.5% aqueous solution.
For skin 1-2% solution in ethanol (10-20%).

Directions : Clean the part with soap and water. Paint it on the skin or in the mouth or vulva.

CONTRAINDICATIONS

Should not be applied to the eye. Ulcerative lesions of the face may cause permanent pigmentation.

ADVERSE EFFECTS

Well tolerated drug. May cause ulceration of the mucous membrane.

INTERACTIONS

Antiseptic activity greatly reduced in presence of blood serum.

DIRECTIONS FOR STORAGE

Store crystals in an airtight bottle. Paint should be stored at a temperature not exceeding 25°C.

NAME OF THE DRUG

Iodine

INDICATIONS

Disinfectant for wounds and abrasions

DRUG SUMMARY

Iodine has a powerful bactericidal action and is used for disinfecting unbroken skin before operation, as first aid treatment of small wounds and abrasions. It is active against viruses and fungi. A solution in glycerol can be used as a throat paint.

DOSAGE FORMS, STRENGTH

a) 2 - 2.5% solution in 75% acetone free industrial methylated spirit.
b) 2% solution in glycerol for throat paint.

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults : To be applied on the affected part with a swab stick.

Directions : For local application only.

CONTRAINDICATIONS

NIL

PRECAUTIONS

Do not cover the area where iodine has been applied with occlusive dressings.

ADVERSE EFFECTS

Stains the skin deep reddish brown which can be removed with weak solutions of alkalis or sodium thiosulphate.

INTERACTIONS

When iodine combines chemically it is decolourized and the so-called colourless iodine preparations do not have disinfectant properties.

DIRECTIONS FOR STORAGE

Iodine crystals should be stored in glass-stoppered bottles. Iodine solutions should be stored at a temperature not exceeding 35°C in air-tight containers; protect from light.

NAME OF THE DRUG

Tetracycline eye ointment

INDICATIONS

Eye Infections - Trachoma

DRUG SUMMARY

Has a wide spectrum of activity including bacteria, rickettsia and Chlamydia (trachoma). A useful drug in the form of ointment or drops for eye infection of various kinds.

DOSAGE FORMS, STRENGTH

Eye Ointment 1%

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults : Put inside the eyelids three times a day for 5 days.

Directions : To be applied to both the eyes.

CONTRAINDICATIONS

Not to be given to patients who are hypersensitive to it.

PRECAUTIONS

Ensure that it is not applied on the outside of the eyelids.

ADVERSE EFFECTS

Very rarely hypersensitive reaction - skin rash.

INTERACTIONS

Do not combine with penicillin - antagonises penicillin action.

DIRECTIONS FOR STORAGE

Store at temperature not exceeding 25°C.

NAME OF THE DRUG

Aspirin (acetyl salicylic acid)

INDICATIONS

Pain, Fever, Inflammation

DRUG SUMMARY

Relieves headache, muscular and joint pains, lowers fever and reduces inflammation. Useful in bodyache, toothache, arthritis, tonsillitis, dysmenorrhoea, pharyngitis, common cold and severe arthritis. When used unwisely it can damage the stomach lining eventually resulting in ulcers.

DOSAGE FORMS, STRENGTH

Tablet - 100-500 mg; usually 300 mg.

RECOMMENDED DOSAGE; DURATION & DIRECTIONS

Adults	: 1-2 tablets (300-600 mg)	) 4 times a day for 2-3 days.
Children	: 8-12 years - 1 tablet (300mg)	May require to be repeated.
	3- 7 years -1/2tablet (150mg)	Double dose required for severe
	1- 2 years -1/4tablet (75mg)	arthritis.

Directions : Take aspirin with milk and with plenty of water.

CONTRAINDICATIONS

Patients having stomach ulcer/dyspepsia, hypersensitive individuals, patients having bleeding tendencies, pregnant women.

PRECAUTIONS

Not to be taken on empty stomach. Take history of drug allergy and gastric problems; if positive avoid aspirin use paracetamol. Keep beyond reach of children, large doses can poison them. Use with caution in children below 1 year.

ADVERSE EFFECTS

Dizziness, ringing in the ears, skin eruptions, epigastric distress, abdominal pain, gastric ulcers, increased bleeding tendency, hypersensitivity reactions.

INTERACTIONS

Enhances the activity of oral antidiabetic drugs and anticoagulants.

DIRECTIONS FOR STORAGE

Protect from moisture, excessive heat. Store in airtight containers. Do not dispense when the tablet gives a vinegar odour.

NAME OF THE DRUG

Paracetamol (Acetaminophen)

INDICATIONS

Pain and Fever

DRUG SUMMARY

Equivalent to aspirin in relieving pain and reducing fever. No anti-inflammatory action in doses used; thus when inflammation is contributing to pain aspirin is preferred. It does not cause stomach ulcer, allergy or bleeding tendency as with aspirin.

DOSAGE FORMS, STRENGTH

Tablet - 100-500 mg; Elixir/Syrup 120-125 mg/5ml.

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults	: 1 tablet (500 mg)	) 4 times a day for 2-3 days
Children	: 8-12 years - 1 tablet (500 mg) 3- 7 years - 1/2 tablet (250 mg) 6 months - 2 years - 5ml (125 mg) Less than 6 months - 2.5 ml (62.5 mg)	) 4 times a day for 2-3 days
Directions	: To be taken before meals or 2 hours after meals.	

CONTRAINDICATIONS

Patients with severe liver and kidney damage

PRÉCAUTIONS

1. Children below 8 years should not be given more than 1.2 g/day and older children and adults 5-10 g/day (25 g is fatal).
2. The drug should not be continued for more than 7 days as it may be toxic.

ADVERSE EFFECTS

Rarely skin rash. Larger doses - 10 g can be hepatotoxic.
Heavy smokers/alcoholics are more susceptible to adverse effects.

INTERACTIONS

Concurrent use of alcohol or heavy smoking may increase toxicity.

DIRECTIONS FOR STORAGE

Keep in well-closed containers; protect from light.

NAME OF THE DRUG

Benzoic acid + Salicylic acid (Whitfield's ointment)

INDICATIONS

Ringworm & other fungal infections of skin

DRUG SUMMARY

The drug stops the growth of the fungus and removes the superficial portion of the skin containing the fungus. The ointment can easily be made by taking 3 and 6 parts respectively of Salicylic and Benzoic acid and 91 parts of vaseline.

DOSAGE FORMS, STRENGTH

Salicylic acid in fine powder	30 g
Benzoic acid in fine powder	60 g
Emulsifying ointment	910 g

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults : For local application. Treatment may be required for weeks/months.

Directions : Wash the area with soap and water, dry, apply ointment 3 or 4 times a day.

PRECAUTIONS

Bathing and care of personal hygiene would help in bringing quicker relief.

ADVERSE EFFECTS

Rarely mild redness at the site of application. No cause for alarm.

DIRECTIONS FOR STORAGE

Store at temperature not exceeding 25°C.

NAME OF THE DRUG

Oxyphenonium bromidine

INDICATIONS

Gut cramps or colicky pain

DRUG SUMMARY

An atropine-like drug which relieves cramps or spasms of the smooth muscles such as stomach, intestine and ureter. It also reduces the secretions. It is now used as an adjunct in the treatment of stomach and intestinal ulcers and in renal colic.

DOSAGE FORMS, STRENGTH

Tablet - 5 mg; Drops 10 mg/ml

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults	:	5-10 mg	Four times a day for 2-3 days.	
Children	:	7-12 years	8-15 drops	) 3 times a day for
		2- 6 years	5- 8 drops	) 2-3 days

CONTRAINDICATIONS

Patients with enlarged prostate, glaucoma.

PRECAUTIONS

Do not use in children if they have high fever. Do not use in children below 2 years.

ADVERSE EFFECTS

Dryness of the mouth, thirst, flushing and dryness of skin, desire to urinate with inability to do so, constipation, dilatation of pupil.

INTERACTIONS

The action is enhanced by concomitant use of antihistaminics, imipramine and phenothiazines.

DIRECTIONS FOR STORAGE

Store in airtight containers; protect from light.

NAME OF THE DRUG

Antihaemorrhoidal suppository or ointment

INDICATIONS

Piles (Haemorrhoids)

DRUG SUMMARY

These are usually a combination of a local anaesthetic e.g. lignocaine + anti-inflammatory e.g. cortisone and an astringent agent e.g. chlorhexidine. Many germicidal protein precipitating agents act as astringents in high dilution. These remedies make haemorrhoids smaller and less painful.

DOSAGE FORMS, STRENGTH

Suppositories, ointment

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults : 1. Apply small amount of ointment 2-3 times a day preferably before and after each bowel movement and at bed time.

2. Put the suppository up the anus after the daily bowel movement, and another on going to bed.

PRECAUTIONS

In cases of local infection treat it with appropriate antibiotic. Use of ispaghul husk would also relieve pain by making the stools soft.

ADVERSE EFFECTS

Persons hypersensitive to any of the three ingredients may have allergic reactions.

DIRECTIONS FOR STORAGE

Suppositories should be kept in a well closed container at a temperature not exceeding 25°C and ointment at a temperature not exceeding 25°C.

NAME OF THE DRUG

Aluminium hydroxide

INDICATIONS

Indigestion, heartburn & stomach ulcers

DRUG SUMMARY

The drug gives relief by neutralizing the acid of the stomach. It is mostly marketed with other agents specially magnesium hydroxide. The combination increases efficacy, prolongs duration and reduces side effects. Liquid preparations are more effective.

DOSAGE FORMS, STRENGTH

Tablet - 500 mg
Oral suspension - 320 mg/5 ml

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults	:	1 Tablet (500 mg) to be chewed or sucked 3-4 times a day. Treatment required for long time. Prescribe for 5 days and then consult doctor for further use Not usually needed for children.
Children	:	Not usually needed for children.
Directions	:	For acid indigestion and heartburn chew 1-2 tablets when required. For ulcers take one hour after meals and at bed time.

CONTRAINDICATIONS

Not to be used indiscriminately for every little belch or upper gastro-intestinal upset. These are a much abused group of drugs.

PRECAUTIONS

Avoid indiscriminate use with other drugs such as digoxin, diazepam, tetracycline and sulphonamides as it impairs their absorption.

ADVERSE EFFECTS

Tends to constipate if used alone. Prolonged indiscriminate use may lead to osteomalacia and kidney stones.

DIRECTIONS FOR STORAGE

Store at room temperature preferably below 25°C. Keep in airtight containers

NAME OF THE DRUG

Ampicillin

INDICATIONS

Wide spectrum antibiotic

DRUG SUMMARY

A drug which acts and destroys several varieties of bacteria. It is safer than other broad spectrum antibiotics and is specially useful for babies and small children and pregnant women. Useful in septicaemia and unexplained illness of newborn, ear infections, severe diarrhoea with fever, urinary tract infection, upper respiratory infection, typhoid fever specially carriers, meningitis, gall bladder infection, soft tissue infections and gonorrhoea.

DOSAGE FORMS, STRENGTH

Capsule - 250-500 mg; Oral suspension 125-250 mg/5 ml;
Paediatric drops 100 mg/ml

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults : 2 capsules (500 mg)

Children	:	8-12 years 1 capsule or 2 teaspoonful (250 mg)	) Four times
		3- 7 years 1/2 capsule or 1 teaspoonful (125 mg)	) a day for 5
Under 3 years and newborn		1/4 capsule or 1/2 teaspoonful(62 mg)	) days (Continue for 2 days after fever and symptoms disappear.)

Direction : Reduce dose in renal disease.

CONTRAINDICATIONS

Patients allergic to any member of the penicillin and cephalosporin series.

PRECAUTIONS

Record history of previous consumption and allergy. Anaphylaxis extremely rare. Adrenaline is the antidote.

ADVERSE EFFECTS

Skin rash and very rarely blood dyscrasias. Anaphylactic shock is possible though not more than 12 cases are recorded in world literature.

INTERACTIONS

1. Increased possibility of skin rashes in subjects on allopurinol.
2. Diminishes the effect of oral contraceptives.

DIRECTIONS FOR STORAGE

Store in air-tight containers at a temperature not more than 30°C.

NAME OF THE DRUG

Trimethoprim

INDICATIONS

Urinary tract infection

DRUG SUMMARY

A drug related to the antimalarial pyrmethamine. Trimethoprim has been extensively used in combination with sulphonamide as cotrimoxazole. The drug is readily absorbed from gastro-intestinal tract and widely distributed in the body, especially in kidneys, lungs and also in the brain.

DOSAGE FORMS, STRENGTH

Tablet - 100 mg.

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults	:	200 mg	(2 tablets) twice a day	For 5 days
Children	:	7-12 years	100 mg (1 tablet) twice a day	
		4- 6 years	50 mg (1/2tablet)twice a day	
		3 months- 3 years	25 mg (1/4tablet)twice a day	

Directions : Do not continue the drug for more than 5 days.

CONTRAINDICATIONS

Pregnant and nursing mothers; infants below 3 months and patients with severe liver damage or macrocytic anaemia.

PRECAUTIONS

Check blood film, discontinue therapy if any evidence of macrocytic anemia. The antidote for bone marrow depression is calcium folinate.

ADVERSE EFFECTS

Transient ones like nausea, vomiting, glossitis, skin rash.

DIRECTIONS FOR STORAGE

Store below 30^{o}C; protect from light and keep in airtight containers

NAME OF THE DRUG

Penicillin

INDICATIONS

Bacterial infection

DRUG SUMMARY

Penicillin is the drug of choice for wound infection, abscesses, boils, diphtheria, tonsillitis, gangrene, tetanus, pneumonia, rheumatic fever, bronchitis, meningitis, ear infection, infected tooth, infected bones, gonorrhoea, syphilis. Procaine Penicillin G is an intermediate acting preparation and Phenoxymethyl Penicillin (Pen V) is orally effective. The former is meant for moderate to severe infections and the latter for mild to moderate infections.

DOSAGE FORMS, STRENGTH

Procaine Penicillin G injection 300 000 - 600 000 U/ml
Phenoxymethyl Penicillin (Pen V) Tablet 125-250 mg.
Suspension 125 or 250 mg/5 ml

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults : See Annexure

Children : " "

Directions : Must record history of previous exposure; should perform the skin sensitivity test before administration; must keep the patient under observation for 30 minutes. Keep adrenaline should be readily available.

CONTRAINDICATIONS

Patients allergic to penicillin or any other member of the series like ampicillin, amoxycillin, carbenicillin, cloxacillin and cephalosporins.

PRECAUTIONS

Take history of previous exposure and drug allergy. Perform skin test. Always have adrenaline 1 in 1000 available. In case of anaphylactic shock inject 0.5 ml subcutaneously in adults and 0.3 ml in children.

ADVERSE EFFECTS

For most people one of the safest drugs. Allergic reaction can be mild which manifests itself several days after as rash. Rarely anaphylactic shock in which patient becomes pale, has difficulty in breathing and goes in shock and collapse. Adrenaline to be injected at once.

INTERACTIONS

Penicillin and gentamicin should not be mixed in the same bottle.
Penicillin inactivates gentamicin.

DIRECTIONS FOR STORAGE

Penicillin G should be stored in well closed container at a temperature of not more than 30°C. Oral penicillin should be kept in a well closed container.

ANNEXURE

Penicillin (continued)

RECOMMENDED DOSAGE, DURATION AND DIRECTIONS

For mild to moderate infection - Penicillin V orally

Adults	2 tablets (250 mg)	)	Four times a day for 5-7 days (Continue for 2 days after symptoms and fever cured)
Children 6-12 years	1 tablet (125 mg); 1 teaspoonful	)	
under 6 years	1/2tablet (65 mg);1/2 teaspoonful	)	

For more serious infection double the dose.

For moderate to severe infection - Procaine Penicillin G injection

Adults 300 000 - 600 000 U

Children 8-12 years	300 000 U	)	Once a day for 5 days (Continue for 2 days after the symptoms and fever disappear) (For adults and children)
3- 7 years	150 000 U	)	
under 3 years	75 000 U	)	

Do not use in newborn babies. Ampicillin is preferred.

NOTE : Add water for injection in the vial, shake it well before injecting.

For Gonorrhoea

Procaine Penicillin G - 4 800 000 U inject
half the amount in each buttock.

For Syphilis

Procaine Penicillin G-inject. 600 000 U once a day for 8-10 days

SENSITIVITY TEST

Clean the skin of the inner side of the forearm with soap and water or alcohol, let it dry. Take 0.1 ml (1000 I.U.) of the drug in a syringe with a small needle. Hold the syringe flat against the skin, inject the drug just into the skin so that a raised area the size of a pea is formed; remove the needle.

Watch for 30 minutes for red, painful swelling at the site, rash on the body, itching, swelling, difficulty in breathing, weak rapid pulse, cool grey skin and collapse. If none of these occur, it is safe to give penicillin BUT ALWAYS KEEP ADRENALINE READY.

NAME OF THE DRUG

Sulphadimidine

INDICATIONS

Common infections

DRUG SUMMARY

Though effective on several type of bacteria, it is weaker than many currently available antimicrobials. As the drug is effective orally, travels to various body fluids and brain, is inexpensive, it is felt that at least for some conditions like genitourinary, skin and ear infections, this should be the first-line drug; in fact it can be tried for all infections. Sulphadimidine is a well absorbed and rapidly excreted drug which does not form crystals in urine.

DOSAGE FORMS, STRENGTH

Tablet - 0.5 g; Mixture 500 mg/5 ml

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults : 6 tablets first dose, then 2 tablets every 6 hours

Children	: 8-12 years	4 tablets first dose, then 2 tablets every 6 hours	) For 5 days
	4- 8 years	1 1/2 tablet every 6 hours	)
	2- 4 years	1 tablet every 6 hours	
	3 months-2 years	1/2 tablet every 6 hours	

Directions : Drink lots of water with the drug.

CONTRAINDICATIONS

Not to be used in infants up to 3 months. Should not be given to pregnant women in the last month of pregnancy or to nursing mothers. Do not give to dehydrated individuals.

PRECAUTIONS

Discontinue treatment at once if a rash appears, if there is itching, joint pain, fever, lower body pain or blood in urine. Drink lots of water. Not to be applied topically (on skin).

ADVERSE EFFECTS

Transient like malaise, headache, nausea, vomiting. Serious ones are allergic reactions, skin rash, hepatitis, drug fever, agranulocytosis, aplastic anaemia, joint pain, haemolysis specially in G6PD deficient persons.

INTERACTIONS

Increases the effect of oral anticoagulants,oral antidiabetics, thiazide diuretic. Drugs like salicylates and indomethacin can increase the effect of sulphonamide.

DIRECTIONS FOR STORAGE

Store in airtight containers; protect from light.

NAME OF THE DRUG

Activated Charcoal

INDICATIONS

For swallowed poisons

DRUG SUMMARY

An odourless, tasteless fine black powder which has broad spectrum absorptive properties for orally ingested drugs - a most valuable single agent for the emergency treatment of poisoning with drugs like aspirin, barbiturates, chlorphenirimine, chloroquine and quinine. Acts only on unabsorbed drug and that which comes again in bile. Not of use in poisoning with strong acids, alkalis and iron.

DOSAGE FORMS, STRENGTH

Powder

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults : Prepare by mixing 2 tablespoonful (50 g) in a glass of water (400 ml).
Use 5 ml/kg of the above either orally or by a gastric tube.
Repeat at 20 minutes interval till 50 g or 1 glass is taken

Children : Same dose as for adults.

Directions : Should be followed by stomach lavage after some time.

CONTRAINDICATIONS

NIL

PRECAUTIONS

Should not be given simultaneously with an emetic such as ipecac.

ADVERSE EFFECTS

Non-toxic when given by mouth, regular use may alter the normal gastro-intestinal absorption pattern.

INTERACTIONS

Chemically acts by resorption of unabsorbed orally ingested or recycled drug in the bile. Drug does not appear to desorb from this combination.

DIRECTIONS FOR STORAGE

Store in airtight containers.

NAME OF THE DRUG

Lindane

INDICATIONS

For lice

DRUG SUMMARY

Lindane or Gamma Benzene Hexachloride is a useful drug for scabies & lice. For the latter a water solution 0.1-0.2% can be used. The mixture is applied as a thin layer over the entire cutaneous surface for 24 hours. Usually a single application works. If repetition required do so after 8 days. The compound is readily absorbed through skin and in cases where skin is excoriated use weaker solution. Benzyl benzoate is preferred for scabies. Lindane should be used for lice only.

DOSAGE FORMS, STRENGTH

Lotion or cream 1% or less

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults : Use 0.2 - 1% lotion or cream.

Children : Better be avoided in children. See under benzyl benzoate.

Directions : Repeat after 8 days if required

CONTRAINDICATIONS

Avoid use in pregnant women, infants and children

PRECAUTIONS

1. Not to apply after hot soapy bath as this increases the absorption from the skin.
2. Keep the drug away from face and eyes as it is irritant.

ADVERSE EFFECTS

Even when applied locally it can cause convulsions in children.

INTERACTIONS

It stimulates liver enzymes. Children are considered to be particularly at risk.

DIRECTIONS FOR STORAGE

Protect from light.

NAME OF THE DRUG

Benzyl Benzoate

INDICATIONS

For scabies and lice

DRUG SUMMARY

Is a relatively harmless substance when compared with lindane. The drug has been widely employed in the treatment of scabies and lice. The lotion is applied to the entire body except the face. When the first application is dry, a second is applied. After 24 hours, another application is made. Alternatively 3 applications may be made at 12 hours intervals. Clothing and bedding should be changed to prevent reinfestation.

DOSAGE FORMS, STRENGTH

Benzyl benzoate 25% application.

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults : For local application.

Children : Safe for children.

Directions : The patient should be scrubbed with soap in a hot bath to open up the burrows and immediately after drying benzyl benzoate is applied over the whole body surface from the neck down; a second application is made on the following day.

PRECAUTIONS

1. Benzyl benzoate should not be allowed to come in contact with eyes.
2. Clothing and bedding should be changed to prevent reinfestation.

ADVERSE EFFECTS

1. Irritant to the eye and skin.
2. Hypersensitivity reactions have been reported.

DIRECTIONS FOR STORAGE

Store at temperature not exceeding 40°C in well-fitted airtight container, protect from light.

NAME OF THE DRUG

Chloroquine

INDICATIONS

Malaria

DRUG SUMMARY

A good drug for malaria, readily absorbed from the gut and concentrated several-fold in the liver, spleen and kidney. Cures P. falciparum (M.T.) and suppresses P.vivax (B.T.) malaria. Also useful in the treatment of extra-intestinal amoebiasis. Has anti-inflammatory property, can be safely used in pregnant women.

DOSAGE FORMS, STRENGTH

Tablet 250 mg (150 mg base). Syrup 160 mg (100 mg base/10 ml)
1 teaspoonful = 5 ml = 50 mg = 1/3 tablet

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Children : See Annexure for the treatment of acute attack and for chemoprophylaxis.

CONTRAINDICATIONS

Not to be used in presence of severe gastrointestinal, neurological or blood disorders.

PRECAUTIONS

Preferably not to be taken on empty stomach. Use with caution in presence of hepatic disease. Ophthalmological checks are necessary if used for prolonged periods.

ADVERSE EFFECTS

Generally well tolerated; may cause transient headache, visual disturbance, gastric upsets, pruritus, which disappear on discontinuation of the drug.

INTERACTIONS

Concomitant use with phenylbutazone may precipitate dermatitis.

DIRECTIONS FOR STORAGE

Protect from light and moisture.

ANNEXURE

Chloroquine (continued)

RECOMMENDED DOSAGE, DURATION AND DIRECTIONS

For Acute Attack	Immediately	After 6 hours	2nd day	3rd day	Total
Adults	4 tablets	2	2	2	10
Children 9-12 years	3 tablets	1 1/2	1 1/2	1 1/2	7 1/2
6- 8 years	2 tablets	1	1	1	5
2- 5 years	4 teaspoonful	2	2	2	10
12-23 months	3 teaspoonful	1 1/2	1 1/2	1 1/2	7 1/2
9-12 months	2 teaspoonful	1	1	1	5
below 8 months	1 teaspoonful	1/2	1/2	1/2	2 1/2

For Chemoprophylaxis (give each week)

Adults	2	tablets
Children 9-12 years	1 1/2	tablet
6- 8 years	1	tablet
2- 5 years	2	teaspoonful
12-23 months	1 1/2	teaspoonful
9-12 months	1	teaspoonful
below 8 months	1/2	teaspoonful

NOTE : 1 teaspoon = 5 ml = 50 mg = 1/3 tablet.

NAME OF THE DRUG

Promethazine

INDICATIONS

Vomiting/Motion sickness

DRUG SUMMARY

The drug has potent antiemetic and antinausea properties. It is basically an antihistamine and is a good general purpose drug, the action of which lasts for 20 hours or so, and therefore a single dose taken in the evening suffices. It has long lasting hypnotic effect specially in children. Useful in the prevention and treatment of allergic disorders.

DOSAGE FORMS, STRENGTH

Promethazine hydrochloride; elixir 5 mg/ 5 ml; injections 25 mg/ml
tablet 10 & 25 mg.

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults	:	Dose - 1 mg/kg/day	25-50 mg	
Children	:	7-12 years	12.5 - 25 mg	)
		2- 6 years	6 - 12 mg	) To be taken when required
		Baby 1 year	4 mg	) for allergy preferably
		Under 1 year	3 mg	) in the evening

CONTRAINDICATIONS

Patients with severe liver disease.

PRECAUTIONS

Causes drowsiness and dulling of mental alertness. Patients on this drug should not drive vehicles or work on machinery where loss of attention may lead to accidents.

ADVERSE EFFECTS

Slight alterations in blood pressure, skin reaction and, rarely, fits in children can occur besides sedation which is marked with this drug.

INTERACTIONS

Alcohol, barbiturates, diazepam can increase the sedative effect of promethazine.

DIRECTIONS FOR STORAGE

Store in airtight containers. Protect from light.

NAME OF THE DRUG

Retinol

INDICATIONS

For night blindness and xerosis

DRUG SUMMARY

Retinol or vitamin A is present in spinach, carrots, butter, cream, eggyolk, milk, nuts and fruits. It is a light yellow or red oil which has a mild fishy odour. Vitamin A is essential for the formulation of visual pigments necessary for vision in dim light. It is also required for keeping the skin and mucous membrane moist. Vitamin A deficiency is linked with protein calorie malnutrition and such persons are more prone to infection.

DOSAGE FORMS, STRENGTH

Capsule or tablet 7.5 mg (25 000 I.U.); Oily solution 15 mg/ml 50 000 I.U. 60.0 mg (200 000 I.U.)

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults : Give one capsule (200 000 I.U.) by mouth for Therapeutic dose.

Children : Give one capsule (200 000 I.U.) by mouth as therapeutic dose. (The eyes should become normal within a week. If no change observed repeat the dose.

(For both adults & children)

Directions : In areas where the deficiency is endemic repeat a capsule every 3-6 months. The patients should be advised to take foods containing carrots, butter, egg, milk, nuts and fruits.

CONTRAINDICATIONS

Too much vitamin A can cause fits.

PRECAUTIONS

Avoid the drug in excess and keep it out of reach of children.

ADVERSE EFFECTS

Excessive amounts would result in hypervitaminosis A. This only occurs when the drug is taken for very long periods.

DIRECTIONS FOR STORAGE

Store in a cool dry place.

NAME OF THE DRUG

Mebendazole

INDICATIONS

For all types of worms

DRUG SUMMARY

A versatile drug effective against round worm, pin worm, hook worm, whip worm, tape worm and even guinea worm. Works well for mixed infection. The drug paralyses the worm in the host's gut and kills it slowly. Most of the drug remains in the gut and only a small portion is excreted in urine.

DOSAGE FORMS, STRENGTH

Tablet - 100 mg, Suspension 100 mg/5 ml.

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults :) 1 tablet (100 mg) or 1 teaspoonful (5 ml) morning and evening
) for 3 consecutive days for all worms except pin worm
Children :) (Oxyuris). For this, single dose 1 tablet or 1 teaspoonful second dose may be given after 14 days.

Directions : Does not require any preparation or purgation.
The patient should look for expulsion of worms in the stools

CONTRAINDICATIONS

1. Pregnant women and children below 2 years.
2. Patients who have experienced allergic reactions to it.

PRECAUTIONS

Medicines by themselves are not enough to get rid of worms for very long. Personal and public cleanliness are necessary. When a person in the family suffers treat the whole family.

ADVERSE EFFECTS

Transient symptoms of diarrhoea and abdominal pain may occur.

DIRECTIONS FOR STORAGE

Keep in airtight containers. Protect from light and moisture.

NAME OF THE DRUG

Piperazine

INDICATIONS

Round and pin worms

DRUG SUMMARY

Available as citrate, tartrate, hydrate, adipate or phosphate salt. The worm is paralysed by the drug in the host's gut and is expelled by the gut movement. Though effective in gut lumen it is absorbed from the gut wall and excreted in the urine.

DOSAGE FORMS, STRENGTH

Tablet - 500 mg; Syrup 100 mg/ml

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

	For round worms (Ascaris)	For Pin worm (Oxyuris)
Adults	: 6 tablets (3 g) single dose	5 tablets (2.5 g) once a day
Children	: 8-12 years - 4 tablets once a day	8-12 years - 1 1/2 tablets once a day
	3- 7 years - 2 tablets once a day	3- 7 years - 1 tablet once a day
	1- 3 years - 1 tablet once a day	under 3 years - 1/2 tablet once a day
Babies under 1 year	- 1/2 tablet once a day	

Directions : Treatment for round worm - daily dose for 2 days
Treatment for pin work - daily dose for 7 days

CONTRAINDICATIONS

In patients having epilepsy, liver disease, renal or neurological disorders.

PRECAUTIONS

Medicines by themselves are not enough. Give due attention to personal and public cleanliness. Drinking water and raw vegetables should be specially treated to remove contamination.

ADVERSE EFFECTS

Serious ones are rare; may cause nausea, headache, abdominal discomfort. May cause severe neurotoxicity specially in epileptic patients.

INTERACTIONS

Can increase the action of chlorpromazine.

DIRECTIONS FOR STORAGE

In airtight containers, protect from light.

NAME OF THE DRUG

Metrifonate

INDICATIONS

Schistosomiasis

DRUG SUMMARY

An orally effective, low-cost, useful remedy for the treatment of urinary schistosomiasis; chemically related to organophosphorus insecticides. In mixed infection of S.haematobium (urinary) and S.mansoni (intestinal) can be combined with oxaminoquine. However praziquantel is a better drug.

DOSAGE FORMS, STRENGTH

Tablet - 100 mg.

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults	)	7.5 mg/kg/dose	Three such doses given at 14 days interval i.e. dosing on day 1, day 15 and day 30
Children	)		

CONTRAINDICATIONS

In pregnant women.

PRECAUTIONS

Do not repeat before 14 days; ensure that the recipient was not exposed to organophosphorus insecticide. For accidental poisoning atropine injection is the antidote.

ADVERSE EFFECTS

May cause nausea, vomiting, abdominal pain, headache and vertigo.

DIRECTIONS FOR STORAGE

Store in airtight containers; protect from light and moisture.

NAME OF THE DRUG

Praziquantel

INDICATIONS

Schistosomiasis

DRUG SUMMARY

A highly effective, orally administered drug for all the three types of Schistosomiasis (S.haematobium, S.mansoni and S.japonicum). A single dose makes the individual free of infection in more than 96% cases of schistosomiasis (urinary and intestinal). Useful in mixed infection and effective against tape worms. Drug of choice for schistosomiasis.

DOSAGE FORMS, STRENGTH

Tablet - 400 mg, which can be easily quartered.

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults :)
) 50 mg/kg single dose
Children :)

Directions : To be taken after breakfast or morning meal.

CONTRAINDICATIONS

No contraindications. As a new drug avoid use in pregnant and nursing mothers and in infants.

PRECAUTIONS

In view of possible giddiness and drowsiness it is recommended that the patient stays at home on day of therapy.

ADVERSE EFFECTS

No serious toxicity. Trivial side effects like nausea, abdominal discomfort, fever and giddiness.

DIRECTIONS FOR STORAGE

Keep in airtight containers; protect from light and moisture.

NAME OF THE DRUG

Calamine Lotion

INDICATIONS

Dermatological soothing agent

DRUG SUMMARY

Useful agent for local applications on the skin for a wide variety of disorders including pruritus, erythema or redness and swelling, urticaria, eczema, photosensitivity, impetigo. Basically it is zinc carbonate coloured with ferric oxide. It has mild astringent, antiperspirant and mild antiseptic properties. The net result is a protective and soothing effect.

DOSAGE FORMS, STRENGTH

Calamine Lotion U.S.P.*

COMPOSITION

Calamine	8 g
Zinc Oxide	8 g
Glycerol	2 ml
Bentonite magma	25 ml
Calcium hydroxide topical solution	100 ml

Directions : FOR EXTERNAL USE ONLY.
For local application without rubbing.

PRECAUTIONS

To be applied on unbroken skin without rubbing.

DIRECTIONS FOR STORAGE

Store in airtight containers.

* Alternative formulae are available in other publications e.g. B.P. and Martindale (Extra Pharmacopoeia)

NAME OF THE DRUG

Ergometrine

INDICATIONS

Severe uterine bleeding.

DRUG SUMMARY

Ergometrine is obtained from ergot, a fungus that grows on infected rye and other grains. It produces characteristic uterine contractions which are forceful and prolonged and the resting tonus is markedly increased. This effect can therefore be made use of in contracting the uterus after birth of the baby and the placenta. This action is not suited for inducing labour but can be used for the symptomatic relief of severe uterine bleeding (more than 2 cups). The drug should be given only by personnel handling delivery cases.

DOSAGE FORMS, STRENGTH

Tablet 0.2 mg

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults : 1 tablet 3 or 4 times a day
If bleeding is heavy give 2 tablets.

Directions : In cases of childbirth and abortion give the drug only after the birth of child and the delivery of placenta.

CONTRAINDICATIONS

During pregnancy, for inducing labour, patients with sepsis or severe infection, severe hypertension, coronary insufficiency, patients having severe liver or kidney damage.

PRECAUTIONS

To be used only after the baby is born and the placenta or afterbirth has come out. If the patient complains of numbness and tingling discontinue the drug.

ADVERSE EFFECTS

Not seen frequently. Headache, vertigo, tinnitus, abdominal pain, nausea and vomiting may be seen rarely. These do not require discontinuation of treatment.

INTERACTIONS

Adrenaline enhances the vasoconstrictive effect of ergometrine. The effect of ergometrine on the uterus is diminished by halothane.

DIRECTIONS FOR STORAGE

Keep in airtight containers; protect from light and moisture.

NAME OF THE DRUG

Ipecacuanha

INDICATIONS

To induce vomiting

SUMMARY

Ipecac in small doses acts as an expectorant but when large doses are employed it induces vomiting within 30 minutes of administration of the drug due to irritation of the gastrointestinal tract. For the emetic action the drug should be followed with plenty of water. The active principle of ipecac is emetine.

DOSAGE FORMS, STRENGTH

Syrup of Ipecac USP containing 0.14% emetine
Paediatric Ipecacuanha emetine mixture B.P. containing emetine 0.12% to 0.16%

RECOMMENDED DOSAGE, DURATION & DIRECTIONS

Adults : 3-6 teaspoonfuls (15-30 ml)

Children : 18 months - 5 years - 3 teaspoonfuls (15 ml)
6 months - 18 months - 2 teaspoonfuls (10 ml)

Directions : To be taken with a glass of water. If no vomiting occurs within 30 minutes repeat the drug.

CONTRAINDICATIONS

Not to be used in subjects who have swallowed strong acids, gasoline or kerosene.

PRECAUTIONS

Not to be used in cases in a state of shock and coma. It should not be given after milk or charcoal. MAKE SURE THAT IT IS NOT IPECAC FLUID EXTRACT WHICH IS 14 TIMES STRONGER.

ADVERSE EFFECTS

Large doses may lead to persistent vomiting and bloody diarrhoea. May lead to ulceration of stomach and intestine. In case vomiting persists give chlorpromazine 25-50 mg intramuscularly.

DIRECTIONS FOR STORAGE

Store in a cool place in airtight container; protect from light.