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The use of essential drugs

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Geneva, 29 November–3 December 1982

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THE USE OF ESSENTIAL DRUGS

Report of a WHO Expert Committee

The WHO Expert Committee on the Use of Essential Drugs met in Geneva from 29 November to 3 December 1982. The meeting was opened on behalf of the Director-General by Dr B. Sankaran, Director, Division of Diagnostic, Therapeutic, and Rehabilitative Technology.

1. INTRODUCTION

In a report[1] to the Twenty-eighth World Health Assembly in 1975, the Director-General reviewed the main drug problems facing the developing countries and outlined possible new drug policies. The Director-General also referred to the experience gained in some countries where schemes of basic or essential drugs had been implemented. Such schemes were intended to extend the accessibility of the most necessary drugs to those populations whose basic health needs could not be met by the existing supply system. He pointed out that the selection of these essential drugs would depend on the health needs and on the structure and development of health services of each country, and that lists of essential drugs should be drawn up locally, and periodically updated, with the advice of experts in public health, medicine, pharmacology, pharmacy and drug management. He also considered that adequate information on the properties, indications and use of the drugs listed should be provided. By resolution WHA28.66, the Health Assembly requested the Director-General to implement the proposals contained in his report and, in particular, to advise Member States on the selection and procurement, at reasonable cost, of essential drugs of established quality corresponding to their national health needs.

Following wide consultation, an initial model list of essential drugs was issued in the first report of the Expert Committee on the

[1] WHO Official Records, No. 226, 1975, Annex 13, pp. 96–110.

Selection of Essential Drugs.[1] This was subsequently revised and updated in a second report.[2]

In undertaking a further review of the list the present Expert Committee has throughout been guided by the following statement contained in the previous reports:

"Because of the great differences between countries, the preparation of a drug list of uniform, general applicability and acceptability is not feasible or possible. Therefore, each country has the direct responsibility of evaluating and adopting a list of essential drugs, according to its own policy in the field of health.

"The list of essential drugs based on the guidelines put forward in this report is a model which can furnish a basis for countries to identify their own priorities and to make their own selection."

2. GUIDELINES FOR ESTABLISHING A NATIONAL PROGRAMME FOR ESSENTIAL DRUGS

Since the first report on the selection of essential drugs was published in 1977, the concept of essential drugs has become widely recognized as useful. It has provided a rational basis not only for drug procurement at national level but also for establishing drug requirements at various levels within the health care system. In fact, many developing countries have already selected essential drugs according to their needs and the related programmes are, in some cases, in an advanced stage of implementation.

In order to ensure that an essential drugs programme is adequately instituted at national level, several steps are advised:

(1) The establishment of a list of essential drugs, based on the recommendations of a local committee, is the starting-point of the programme. The committee should include individuals competent in the fields of medicine, pharmacology and pharmacy, as well as peripheral health workers. Where individuals with adequate training are not available within the country, assistance from WHO could be sought.

(2) The international nonproprietary (generic) names for drugs or pharmaceutical substances[3] should be used whenever available, and

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[1] WHO Technical Report Series, No. 615, 1977.

[2] WHO Technical Report Series, No. 641, 1979.

[3] See *International Nonproprietary Names (INN) for Pharmaceutical Substances: Cumulative List No. 6*, Geneva, World Health Organization, 1982. Further lists of proposed and recommended INN are issued periodically as supplements to the *WHO Chronicle*.

prescribers should be provided with a cross-index of nonproprietary and proprietary names.

(3) Concise, accurate, and comprehensive drug information should be prepared to accompany the list of essential drugs.

(4) Quality, including stability and bioavailability, should be assured through testing or regulation, as discussed in section 7.

(5) The success of the entire essential drugs programme is dependent upon the efficient administration of supply, storage and distribution at every point from the manufacturer to the end user. Government intervention may be necessary to ensure the availability of some drugs in the formulations listed, and special arrangements may need to be instituted for the storage and distribution of drugs that have a short shelf-life or require refrigeration.

(6) Efficient management of stocks is necessary to eliminate waste and to ensure continuity of supplies. Procurement policy should be based upon detailed records of turnover. In some instances, drug utilization studies may contribute to a better understanding of true requirements.

(7) Research, both clinical and pharmaceutical, is sometimes required to settle the choice of a particular drug product under local conditions (see section 8).

3. CRITERIA FOR THE SELECTION OF ESSENTIAL DRUGS

Essential drugs are those that satisfy the health care needs of the majority of the population; they should therefore be available at all times in adequate amounts and in the appropriate dosage forms.

The choice of such drugs depends on many factors, such as the pattern of prevalent diseases; the treatment facilities; the training and experience of the available personnel; the financial resources; and genetic, demographic, and environmental factors.

Only those drugs should be selected for which sound and adequate data on efficacy and safety are available from adequate clinical studies and for which evidence of performance in general use in a variety of medical settings has been obtained.

Each selected drug must be available in a form in which adequate quality, including bioavailability, can be assured; its stability under the anticipated conditions of storage and use must be established.

Where two or more drugs appear to be approximately similar in the above respects, the choice between them should be made on the basis of a careful evaluation of their relative efficacy, safety, quality, price, and availability. In cost comparisons between drugs the cost of the total treatment, and not only the unit cost of the drug, must be considered. In some cases the choice may also be influenced by other factors, such as comparative pharmacokinetic properties, or by local considerations such as the availability of facilities for manufacture or storage.

In the great majority of cases essential drugs should be formulated as single compounds. Fixed-ratio combination products are acceptable only when the dosage of each ingredient meets the requirements of a defined population group and when the combination provides a proven advantage over single compounds administered separately in therapeutic effect, safety or compliance.

4. GUIDELINES FOR THE SELECTION OF PHARMACEUTICAL DOSAGE FORMS

The purpose of selecting dosage forms and strengths for the drugs in the model list is to provide guidance to countries wishing to standardize or minimize the number of preparations in their own drug lists. As a general rule, pharmaceutical forms are selected on the basis of their general utility and their wide availability internationally. In many instances, a choice of preparations is provided, particularly in relation to solid dosage forms. Tablets are usually less expensive than capsules, but, while the cost factor should be taken into account, the selection should also be based on a consideration of pharmacokinetics, bioavailability, stability under ambient climatic conditions, availability of excipients, and established local preference.

In a few instances, exemplified by acetylsalicylic acid and paracetamol, a range of dosage strengths is provided from which suitable strengths should be selected on the basis of local availability and need. When precise dosage is not mandatory, the use of scored tablets is recommended as a simple method of making dosage more flexible if so required and, in some instances, to provide a convenient paediatric dose. Specific paediatric dosages and formulations are included in the list only when indicated by special circumstances. In

most instances, dosage is specified in terms of a selected salt or ester but, in other instances—e.g., that of chloroquine—it is calculated, in accordance with common practice, in terms of the active moiety.

5. UPDATING OF LISTS OF ESSENTIAL DRUGS

Experience with the original and the revised model lists, and with regional and national lists of essential drugs, has confirmed the need for regular review and updating. Revision is rendered necessary not only by advances in drug therapy but also in order to meet the needs of practice in the light of experience. Frequent and extensive changes are clearly undesirable since they result in disruption of channels of procurement and distribution and may have implications for the training of health personnel. For this reason a number of drugs have been retained on the model list that have been largely superseded in countries where there is a wider choice of new medications, but that are still used widely and successfully elsewhere.

The present Expert Committee introduced changes only where definite advantages were considered to accrue and, in some cases (e.g., the use of timolol in glaucoma, and cephalosporins), it was considered premature to include drugs of considerable promise on the list. However, several important modifications have been made, particularly in relation to antiinfective drugs, and these are listed in section 11. The Expert Committee noted, as on previous occasions, that as far as is possible individual sections of the list should be reviewed by subsequent committees on the basis of specialist advice and documentation.

6. PROVISION OF INFORMATION ON ESSENTIAL DRUGS

Concise, accurate and comprehensive information on the use of essential drugs should be available to all prescribers in a format that is appropriate to their responsibilities and level of training. In order to assist countries in this task the Expert Committee advised that drug information sheets for doctors, now prepared in draft form in response to a recommendation in the first report of the Expert Committee on the Selection of Essential Drugs, be subjected to

broad consultation and subsequently issued together with general advice on therapeutic matters in a WHO model formulary. These sheets are organized in the following format:

1. International Nonproprietary Name (INN) of each active substance, and recommended dosage form.
2. Pharmacological information: brief description of pharmacological effects and mechanism of action.
3. Clinical information:
   - 3.1 Indications: whenever it is thought appropriate, simple diagnostic criteria should be provided.
   - 3.2 Dosage regimen and relevant pharmacokinetic data:
     - 3.2.1 Average dosage and range for adults and children
     - 3.2.2 Dosing interval
     - 3.2.3 Average duration of treatment
     - 3.2.4 Special situations, e.g., renal, hepatic, cardiac or nutritional insufficiencies which require either upward or downward dosage adjustments
   - 3.3 Contraindications
   - 3.4 Precautions (reference to pregnancy, lactation, etc.)
   - 3.5 Adverse effects (quantitate by category, if possible)
   - 3.6 Drug interactions (to be mentioned only if clinically relevant; drugs used for self-medication should be included)
   - 3.7 Overdosage:
     - 3.7.1 Brief clinical description of symptoms
     - 3.7.2 Non-drug treatment and supportive therapy
     - 3.7.3 Specific antidotes
4. Pharmaceutical information

It was recognized that this formulary, once produced, will need to be updated promptly as occasion demands if it is to be of optimal value and an appropriate consultative procedure will need to be established to permit this.

The Committee also recognized the urgent need for information appropriate to other categories of health personnel and particularly to community health workers. This is further discussed in section 12.

7. QUALITY ASSURANCE

Quality assurance of drugs, as embodied in good manufacturing practice and subsequent monitoring of quality through to utilization, is a critical element in any essential drugs programme. All aspects of these procedures have been dealt with *in extenso* in the

twenty-sixth, twenty-seventh and twenty-eighth reports of the WHO Expert Committee on Specifications for Pharmaceutical Preparation.[1]

WHO has set up a "Certification scheme on the quality of pharmaceutical products moving in international commerce" (in accordance with resolution WHA 28.65)[2] which provides valuable safeguards in relation to imported products, particularly for countries lacking adequate laboratory facilities for drug analyses.

Bioavailability is a specific problem that is of particular importance with products with low solubility or a narrow therapeutic index. In addition, unsatisfactory formulation can result in therapeutic failure due to lack of absorption. This has been discussed in the report of the WHO Scientific Group on the Bioavailability of Drugs.[3]

8. RESEARCH AND DEVELOPMENT

The establishment of essential-drugs programmes in developing countries will improve health care and reduce its costs. Further efforts, however, are required to upgrade medical care and to promote self-reliance through research and development in the clinical, pharmaceutical and administrative sectors.

In the clinical field, new drugs need to be evaluated; the benefits and safety of some traditionally used herbal remedies investigated; the effects of genetic, nutritional, and environmental factors on the therapeutic response established; and the value of non-medicinal forms of treatment explored. Dose–response studies should be conducted where there appear to be differences in therapeutic response or incidence of adverse reactions in specific populations.

In the pharmaceutical field, local quality control facilities need to be developed, and dosage forms that improve the stability of drugs under extreme climatic conditions, or reduce the problem of non-compliance, are required.

Operational research is indispensable to improve procurement procedures, and to evaluate and improve distribution systems, having particular regard to less-commonly required drugs.

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[1] WHO Technical Report Series, No. 614, 1977; No. 645, 1980; No. 681, 1982.

[2] WHO Official Records, No. 226, 1975, p. 35 and Annex 12, p. 88. Republished as supplement to *WHO Chronicle,* Vol. 31, No. 12, 1977.

[3] WHO Technical Report Series, No. 536, 1974.

9. SPECIALIZED APPLICATIONS OF THE ESSENTIAL-DRUGS CONCEPT

Although the concept of essential drugs is directed primarily to the needs of developing countries, it has value in other contexts. The provision of drugs on ships provides an obvious example. It is particularly noteworthy that the model list was used to prepare the list of standard drugs and clinic equipment for 10 000 persons for 3 months developed jointly by WHO and the Office of the United Nations High Commissioner for Refugees as part of an emergency health kit.[1] This kit is also being adopted by other organizations involved in meeting emergency health care needs.

10. REVISED MODEL LIST OF ESSENTIAL DRUGS

Explanatory Notes[2]

In many instances various drugs could serve as alternatives to those on the list. In these cases, the substance selected provides an *example of a therapeutic group* and is distinguished by being preceded by a square symbol (□). It is imperative that this should be understood when drugs are selected at national level, since the choice is then influenced by the comparative cost and availability of equivalent products. Examples of acceptable substitutions include:

- □Codeine: other drugs for the symptomatic treatment of diarrhoea such as diphenoxylate or loperamide or, when indicated for cough relief, noscapine or dextromethorphan.
- □Hydrochlorothiazide: any other thiazide-type diuretic currently in broad clinical use.
- □Hydralazine: any other peripheral vasodilator having an antihypertensive effect.
- □Senna: any mild stimulant laxative (either synthetic or of plant origin).
- □Sulfadimidine: any other short-acting systemically-active sulfonamide unlikely to cause crystalluria.

Numbers in parentheses following the drug names indicate:

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[1] UNITED NATIONS HIGH COMMISSIONER FOR REFUGEES. *Handbook for emergencies*, Geneva, 1982–83, pp. 253–262. The list will be available separately from WHO in English, French, and Spanish.

[2] The numbers preceding the drug groups and subgroups in the model list (e.g., 11; 17.6.2) have been allocated, in accordance with the English alphabetical order, for convenience in referring to the various categories; they have no formal significance.

(1) Drugs subject to international control under the Single Convention on Narcotic Drugs (1961) and the Convention on Psychotropic Substances (1971);
(2) Specific expertise, diagnostic precision or special equipment required for proper use;
(3) Greater potency;
(4) In renal insufficiency, contraindicated or dosage adjustments necessary;
(5) To improve compliance;
(6) Special pharmacokinetic properties for purpose;
(7) Adverse effects diminish benefit/risk ratio;
(8) Limited indications or narrow spectrum of activity;
(9) For epidural anaesthesia.

Letters in parentheses following the drug names indicate the reasons for the inclusion of *complementary drugs:*

(A) When drugs in the main list cannot be made available;
(B) When drugs in the main list are known to be ineffective or inappropriate for a given individual;
(C) For use in rare disorders or in exceptional circumstances.

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]
1. Anaesthetics		
1.1 *General anaesthetics and oxygen*		
ether, anaesthetic (2)		inhalation
halothane (2)		inhalation
nitrous oxide (2)		inhalation
oxygen		inhalation (medicinal gas)
thiopental (2)		powder for injection, 0.5 g, 1.0 g (sodium salt) in ampoule
1.2 *Local anaesthetics*		
□bupivacaine (2, 9)		injection, 0.25%, 0.5% (hydrochloride) in vial
□lidocaine		injection, 1%, 2% (hydrochloride) in vial
		injection, 1%, 2% + epinephrine 1:100 000 in vial
		topical forms, 2–4% (hydrochloride)

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]
2. Analgesics, Antipyretics, Nonsteroidal Antiinflammatory Drugs and Drugs Used to Treat Gout		
	2.1 *Non-opioids*	
acetylsalicylic acid		tablet, 100–500 mg
		suppository, 50–150 mg
allopurinol (4)		tablet, 100 mg
□ibuprofen		tablet, 200 mg
indometacin		capsule or tablet, 25 mg
paracetamol		tablet, 100–500 mg
		suppository, 100 mg
	colchicine (B, C) (7)	tablet, 0.5 mg
	probenecid (B, C)	tablet, 500 mg
	2.2 *Opioid analgesics and antagonists*	
morphine (1)		injection, 10 mg (sulfate or hydrochloride) in 1-ml ampoule
naloxone		injection, 0.4 mg (hydrochloride) in 1-ml ampoule
	□pethidine (A) (4, 10)	injection, 50 mg (hydrochloride) in 1-ml ampoule
3. Antiallergics		
□chlorphenamine		tablet, 4 mg (maleate)
		injection, 10 mg in 1-ml ampoule
epinephrine		injection, 1 mg (as hydrochloride) in 1-ml ampoule
	cromoglicic acid (B) (2, 8)	oral inhalation (cartridge) 20 mg (sodium salt) per dose
4. Antidotes and Other Substances Used in Poisonings		
	4.1 *General*	
charcoal, activated		powder
ipecacuanha		syrup, containing 0.14% ipecacuanha alkaloids calculated as emetine
□sodium sulfate		powder 5–15 g

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]
4. Antidotes and Other Substances Used in Poisonings *(continued)*		
4.2 *Specific*		
atropine		injection, 1 mg (sulfate) in 1-ml ampoule
deferoxamine		injection, 500 mg (mesilate) in vial
dimercaprol (2)		injection in oil, 50 mg/ml in 2-ml ampoule
naloxone		injection, 0.4 mg (hydrochloride) in 1-ml ampoule
protamine sulfate		injection 10 mg/ml in 5-ml ampoule
sodium calcium edetate (2)		injection, 200 mg/ml in 5-ml ampoule
sodium nitrite		injection, 30 mg/ml in 10-ml ampoule
sodium thiosulfate		injection, 250 mg/ml in 50-ml ampoule
	methylthioninium chloride (C)[b]	injection, 10 mg/ml in 10-ml ampoule
	penicillamine (C) (2)	capsule or tablet, 250 mg
5. Antiepileptics		
diazepam		injection, 5 mg/ml in 2-ml ampoule
ethosuximide		capsule or tablet, 250 mg
phenobarbital (1)		tablet, 50 mg, 100 mg syrup, 15 mg/5 ml
phenytoin		capsule or tablet, 25 mg, 100 mg (sodium salt)
		injection, 50 mg (sodium salt)/ml in 5-ml vial
	carbamazepine (B, C)	tablet, 200 mg
	valproic acid (B, C) (2, 4, 7)	tablet, 200 mg (sodium salt)

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

[b] Synonym: methylene blue.

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]
		6. Antiinfective Drugs
		6.1. *Anthelmintic drugs*
□mebendazole		tablet, 100 mg
niclosamide		tablet, 500 mg
piperazine		tablet, 500 mg (citrate or adipate)
		elixir or syrup (as citrate) equivalent to 500 mg hydrate/5 ml
pyrantel		chewable tablet, 250 mg (as embonate)
		oral suspension, 50 mg (as embonate)/ml
tiabendazole		chewable tablet, 500 mg
		6.2 *Antiamoebic drugs*
chloroquine		tablet, 200 mg (as phosphate or sulfate)
diloxanide		tablet, 500 mg (furoate)
□metronidazole		tablet, 200–500 mg
	dehydroemetine (B) (1, 7)	injection, 60 mg (hydrochloride) in 1-ml ampoule
		6.3 *Antibacterial drugs*
		6.3.1 *Penicillins*
□ampicillin (4)		capsule or tablet, 250 mg, 500 mg (anhydrous)
		powder for oral suspension, 125 mg (anhydrous)/5 ml
		powder for injection, 500 mg (as sodium salt) in vial
benzathine benzylpenicillin (5)		injection, 1.44 g benzylpenicillin (= 2.4 million IU)/5 ml in vial
benzylpenicillin		powder for injection, 0.6 g (= 1 million IU), 3.0 g (= 5 million IU) (as sodium or potassium salt) in vial
phenoxymethylpenicillin		tablet, 250 mg (as potassium salt)
		powder for oral suspension 250 mg (as potassium salt)/5 ml
procaine benzylpenicillin (7)		powder for injection, 1 g (= 1 million IU), 3 g (= 3 million IU)

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]
	6. Antiinfective Drugs *(continued)*	
	6.3.2 *Other antibacterial drugs*	
□chloramphenicol (7)		capsule, 250 mg
		powder for injection, 1 g (as sodium succinate) in vial
□cloxacillin		capsule, 500 mg (as sodium salt)
		powder for injection, 500 mg (as sodium salt) in vial
erythromycin		capsule or tablet, 250 mg (as stearate or ethylsuccinate)
		oral suspension, 125 mg (as stearate or ethylsuccinate)/5 ml
		powder for injection, 500 mg (as lactobionate) in vial
□gentamicin (4)		injection, 10 mg, 40 mg (as sulfate)/ml in 2-ml vial
□metronidazole		tablet, 200–500 mg
		injection, 500 mg in 100 ml
		suppository, 500 mg, 1 g
salazosulfapyridine (2)		tablet, 500 mg
spectinomycin (8)		powder for injection, 2 g (as hydrochloride) in vial
□sulfadimidine (4)		tablet, 500 mg
		oral suspension, 500 mg/5 ml
		injection, 1 g (sodium salt) in 3-ml ampoule
□sulfamethoxazole + trimethoprim (4)		tablet, 100 mg + 20 mg, 400 mg + 80 mg
□tetracycline (4)		capsule or tablet, 250 mg (hydrochloride)
	□amikacin (B, C) (4)	injection, 250 mg (sulfate)/ml in 2-ml ampoule
	doxycycline (B) (5, 6)	capsule or tablet, 100 mg (as hydrochloride)
		injection, 100 mg (as hydrochloride)/5 ml in ampoule
	nitrofurantoin (A, B) (4, 7)	tablet, 100 mg

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]
6. Antiinfective Drugs *(continued)*		
	6.3.3 *Antileprosy drugs*	
clofazimine		capsule, 100 mg
dapsone		tablet, 50 mg, 100 mg
rifampicin		capsule or tablet, 150 mg, 300 mg
	ethionamide (B)	tablet, 125 mg, 250 mg
	protionamide (B)	tablet, 125 mg
	6.3.4 *Antituberculosis drugs*	
ethambutol		tablet, 100–500 mg (hydrochloride)[c]
isoniazid		tablet, 100–300 mg
pyrazinamide		tablet, 500 mg
rifampicin		capsule or tablet, 150 mg, 300 mg
streptomycin (4)		powder for injection, 1 g (as sulfate) in vial
thioacetazone + isoniazid		tablet, 50 mg + 100 mg, 150 mg + 300 mg
	6.4 *Antifilarial drugs*	
diethylcarbamazine		tablet, 50 mg (citrate)
suramin sodium		powder for injection, 1 g in vial
	6.5 *Antifungal drugs*	
amphotericin B		powder for injection, 50 mg in vial
griseofulvin (8)		tablet or capsule, 125 mg, 250 mg
nystatin		tablet, 500 000 IU
		pessary, 100 000 IU
	flucytosine (B) (4, 8)	capsule, 250 mg
		infusion, 2.5 g in 250 ml
	6.6 *Antileishmaniasis drugs*	
pentamidine (5)		powder for injection, 200 mg (isetionate or mesilate) in vial
sodium stibogluconate		injection, 33%, equivalent to 10% antimony, in 30-ml vial

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

[c] Two strengths are required for individual dosage adjustment.

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]
	6. Antiinfective Drugs *(continued)*	
	6.7 *Antimalarial drugs*	
□chloroquine		tablet, 150 mg (as phosphate or sulfate)
		syrup, 50 mg (as phosphate or sulfate)/5 ml
primaquine		tablet, 7.5 mg, 15 mg (as phosphate)
quinine		tablet, 300 mg (as bisulfate or sulfate)
		injection, 300 mg (as dihydrochloride)/ml in 2-ml ampoule
	amodiaquine (B)	suspension, 150 mg (as hydrochloride)/5 ml
	sulfadoxine + pyrimethamine (B)	tablet, 500 mg + 25 mg
	6.8 *Antischistosomal drugs*	
metrifonate		tablet, 100 mg
oxamniquine		capsule, 250 mg
		syrup, 250 mg/5 ml
praziquantel		tablet, 600 mg
	6.9 *Antitrypanosomal drugs*	
melarsoprol (5)		injection, 3.6% solution
pentamidine (5)		powder for injection, 200 mg (isetionate or mesilate)
suramin sodium		powder for injection, 1 g in vial
	□nifurtimox (C) (2, 8)	tablet, 30 mg, 120 mg, 250 mg
	7. Antimigraine Drugs	
ergotamine (2, 7)		tablet, 2 mg (as tartrate)

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]
8. Antineoplastic and Immunosuppressive Drugs		
azathioprine (2)		tablet, 50 mg
		powder for injection, 100 mg (as sodium salt) in vial
bleomycin (2)		powder for injection, 15 mg (as sulfate) in vial
busulfan (2)		tablet, 2 mg
calcium folinate (2)[d]		tablet, 15 mg
		injection, 3 mg/ml in 10-ml ampoule
chlorambucil (2)		tablet, 2 mg
cyclophosphamide (2)		tablet, 25 mg
		powder for injection, 500 mg in vial
cytarabine (2)		powder for injection, 100 mg in vial
□doxorubicin (2)		powder for injection, 10 mg, 50 mg (hydrochloride) in vial
fluorouracil (2)		injection, 50 mg/ml in 5-ml ampoule
methotrexate (2)		tablet, 2.5 mg (as sodium salt)
		injection, 50 mg (as sodium salt) in vial
procarbazine		capsule, 50 mg (as hydrochloride)
vincristine (2)		powder for injection, 1 mg, 5 mg (sulfate) in vial
9. Antiparkinsonism Drugs		
□biperiden		tablet, 2 mg (hydrochloride)
		injection, 5 mg (lactate) in 1-ml ampoule
levodopa + □carbidopa (5, 6)		tablet, 100 mg + 10 mg, 250 mg + 25 mg
	levodopa (A)	tablet or capsule, 250 mg

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

[d] Drug for "rescue therapy" with methotrexate.

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]	
10. Blood, Drugs affecting the			
10.1 *Antianaemia drugs*			
ferrous salt		tablet, equivalent to 60 mg iron (as sulfate or fumarate)	
		oral solution, equivalent to 15 mg iron (as sulfate) in 0.6 ml	
folic acid (2)		tablet, 1 mg	
		injection, 1 mg (as sodium salt) in 1-ml ampoule	
□hydroxocobalamin (2)		injection, 1 mg in 1-ml ampoule	
	ferrous salt + folic acid (C)	tablet, 60 mg + 200 µg	
	□ iron dextran (B) (5)	injection, equivalent to 50 mg iron/ml in 2-ml ampoule	
10.2 *Anticoagulants and antagonists*			
heparin		injection, 1000 IU/ml, 5000 IU/ml, 20 000 IU/ml in 1-ml ampoule	
phytomenadione		injection, 10 mg/ml in 5-ml ampoule	
protamine sulfate (2)		injection, 10 mg/ml in 5-ml ampoule	
□warfarin (2, 6)		tablet, 5 mg (sodium salt)	
11. Blood Products and Blood Substitutes			
11.1 *Plasma substitute*			
dextran 70		injectable solution, 6%	
11.2 *Plasma fractions for specific uses*			
albumin, human normal (2, 8)		injectable solution, 25%	All plasma fractions should comply with the WHO Requirements for the Collection, Processing and Quality Control of Human Blood and Blood Products
	antihaemophilic fraction[e] (C) (2, 8)	(dried)	

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

[e] Synonym: factor VIII.

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]	
11. Blood Products and Blood Substitutes *(continued)*			
11.3 *Plasma substitute* (continued)			
factor IX complex (coagulation factors II, VII, IX, X, concentrate)	(c) (2, 8)	(dried)	All plasma fractions should comply with the WHO Requirements for the Collection, Processing and Quality Control of Human Blood and Blood Produets[f]
12. Cardiovascular Drugs			
12.1. *Antianginal drugs*			
glyceryl trinitrate		tablet, (sublingual) 0.5 mg	
□isosorbide dinitrate		tablet, (sublingual) 5 mg	
□propranolol		tablet, 10 mg, 40 mg (hydrochloride)	
		injection, 1 mg (hydrochloride) in 1-ml ampoule	
□verapamil		tablet, 40 mg, 80 mg (hydrochloride)	
		injection, 2.5 mg/ml (hydrochloride) in 2-ml ampoule	
12.2 *Antiarrhythmic drugs*			
isoprenaline		tablet, 10 mg; 15 mg (hydrochloride or sulfate)	
lidocaine		injection, 20 mg (hydrochloride)/ml in 5-ml ampoule	
□procainamide		tablet, 250 mg, 500 mg (hydrochloride)	
		injection, 100 mg (hydrochloride)/ml in 10-ml ampoule	
□propranolol		tablet, 10 mg, 40 mg (hydrochloride)	
		injection, 1 mg (hydrochloride) in 1-ml ampoule	
	□ quinidine (A, B)	tablet, 200 mg (sulfate)	

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

[f] WHO Technical Report Series, No. 626, Annex 1, 1978.

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]
	12. Cardiovascular Drugs *(continued)*	
	12.3 *Antihypertensive drugs*	
□hydralazine		tablet, 50 mg (hydrochloride)
□hydrochlorothiazide		tablet, 50 mg
□propranolol		tablet, 40 mg, 80 mg (hydrochloride)
□sodium nitroprusside (2, 8)		powder for preparing infusion, 50 g in ampoule
	methyldopa (A, B) (7)	tablet, 250 mg
	□reserpine (A) (7)	tablet, 0.1 mg, 0.25 mg
		injection, 1 mg in 1-ml ampoule
	12.4 *Cardiac glycosides*	
digoxin (4)		tablet, 0.0625 mg, 0.25 mg
		oral solution, 0.05 mg/ml
		injection, 0.25 mg/ml in 2-ml ampoule
	digitoxin (B) (6)	tablet, 0.05 mg, 0.1 mg
		oral solution, 1 mg/ml
		injection, 0.2 mg in 1-ml ampoule
	12.5 *Drugs used in shock or anaphylaxis*	
dopamine (2)		injection, 40 mg (hydrochloride)/ml in 5-ml vial
epinephrine		injection, 1 mg (as hydrochloride) in 1-ml ampoule
	13. Dermatological Drugs	
	13.1 *Antifungal drugs*	
benzoic acid + salicylic acid		ointment or cream, 6% + 3%
□miconazole		ointment or cream, 2% (nitrate)
nystatin		ointment or cream, 100 000 IU/g

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]
13. Dermatological Drugs *(continued)*		
13.2 *Antiinfective drugs*		
□neomycin + □bacitracin		ointment, 5 mg neomycin sulfate + 500 IU bacitracin zinc/g
13.3 *Antiinflammatory and antipruritic drugs*		
□betamethasone (3)		ointment or cream, 0.1% (as valerate)
□calamine lotion		lotion
□hydrocortisone		ointment or cream, 1% (acetate)
13.4 *Astringent drugs*		
aluminium acetate		solution, 13% for dilution
13.5 *Keratoplastic and keratolytic agents*		
coal tar		solution, topical 20%
salicylic acid		solution, topical 5%
13.6 *Scabicides and pediculicides*		
benzyl benzoate		lotion, 25%
lindane[g]		cream or lotion, 1%
14. Diagnostic Agents		
edrophonium (2, 8)		injection, 10 mg (chloride) in 1-ml ampoule
tuberculin, purified protein derivative (PPD)		injection
14.1 *Ophthalmic drugs*		
fluorescein		eye drops, 1% (sodium salt)

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

[g] Previously identified as gamma benzene hexachloride.

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]
14. Diagnostic Agents *(continued)*		
14.2 *Radiocontrast media*		
□adipiodone meglumine		injection, 25% in 20-ml vial
□barium sulfate		powder
□iopanoic acid		tablet, 500 mg
□meglumine amidotrizoate		injection, 60% in 20-ml ampoule
□sodium amidotrizoate		injection, 50% in 20-ml ampoule
15. Disinfectants		
□chlorhexidine		solution, 5% (gluconate) for dilution
□iodine		solution, 2.5%
16. Diuretics		
□amiloride		tablet, 5 mg (hydrochloride)
□furosemide		tablet, 40 mg
		injection, 10 mg/ml in 2-ml ampoule
□hydrochlorothiazide		tablet, 50 mg
mannitol		injectable solution, 10%, 20%
spironolactone		tablet, 25 mg
	chlortalidone (B) (6)	tablet, 50 mg
17. Gastrointestinal Drugs		
17.1 *Antacids and other antiulcer drugs*		
aluminium hydroxide		tablet, 500 mg
		oral suspension, 320 mg/5 ml
cimetidine		tablet, 200 mg
		injection, 200 mg in 2-ml ampoule
magnesium hydroxide		oral suspension, equivalent to 550 mg magnesium oxide/10 ml
	calcium carbonate (A, B)	tablet, 600 mg

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]
17. Gastrointestinal Drugs *(continued)*		
17.2 *Antiemetic drugs*		
□promethazine		tablet, 10 mg, 25 mg (hydrochloride)
		elixir or syrup, 5 mg (hydrochloride)/5 ml
		injection, 25 mg (hydrochloride)/ml in 2-ml ampoule
	metoclopramide (C)	tablet, 10 mg (as hydrochloride)
17.3 *Antihaemorrhoidal drugs*		
□local anaesthetic, astringent and anti-inflammatory drug		ointment or suppository
17.4 *Antispasmodic drugs*		
□atropine		tablet, 1 mg (sulfate)
		injection, 1 mg (sulfate) in 1-ml ampoule
17.5 *Cathartic drugs*		
□senna		tablet, 7.5 mg (sennosides)
17.6 *Diarrhoea, drugs used in*		
17.6.1 *Antidiarrhoeal (symptomatic) drugs*		
□codeine (1)		tablet, 30 mg (phosphate)
17.6.2 *Replacement solution*		
oral rehydration salts (for glucose-salt solution)		
	g/litre	
sodium chloride	3.5	
sodium bicarbonate	2.5	
potassium chloride	1.5	
glucose	20.0	

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]
18. Hormones		
18.1 *Adrenal hormones and synthetic substitutes*		
□dexamethasone		tablet, 0.5 mg, 4 mg
		injection, 4 mg (sodium phosphate) in 1-ml ampoule
hydrocortisone		powder for injection, 100 mg (as sodium succinate) in vial
□prednisolone		tablet, 5 mg
	fludrocortisone (C)	tablet, 0.1 mg (acetate)
18.2 *Androgens*		
testosterone (2)		injection, 200 mg (enantate) in 1-ml ampoule
		injection, 25 mg (propionate) in 1-ml ampoule
18.3 *Estrogens*		
□ethinylestradiol		tablet, 0.05 mg
18.4 *Insulins and other antidiabetic agents*		
□compound insulin zinc suspension		injection, 40 IU/ml in 10-ml vial, 80 IU/ml in 10-ml vial
insulin injection		injection, 40 IU/ml in 10-ml vial, 80 IU/ml in 10-ml vial
□glibenclamide		tablet, 5 mg
18.5 *Oral contraceptives*		
□ethinylestradiol + □levonorgestrel		tablet, 0.03 mg + 0.15 mg, 0.05 mg + 0.25 mg
□ethinylestradiol + □norethisterone		tablet, 0.05 mg + 1.0 mg
	□ norethisterone (B)	tablet, 0.35 mg
18.6 *Ovulation inducers*		
	clomifene (C) (2, 8)	tablet, 50 mg (citrate)

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]	
		18. Hormones *(continued)*	
		18.7 *Progestogens*	
□norethisterone		tablet, 5 mg	
		18.8 *Thyroid hormones and antithyroid drugs*	
levothyroxine		tablet, 0.05 mg, 0.1 mg (sodium salt)	
potassium iodide		tablet, 60 mg	
□propylthiouracil		tablet, 50 mg	
		19. Immunologicals	
		19.1 *Sera and immunoglobulins*	
anti-D immunoglobulin (human)		injection, 0.25 mg/ml	All plasma fractions should comply with the WHO Requirements for the Collection, Processing and Quality Control of Human Blood and Blood Products[h]
antirabies hyperimmune serum		injection, 1000 IU in 5-ml ampoule	
antivenom sera		injection	
diphtheria antitoxin		injection, 10 000 IU, 20 000 IU, in vial	
immunoglobulin, human normal (2)		injection	
tetanus antitoxin		injection, 50 000 IU in vial	

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

[h] WHO Technical Report Series, No. 626, Annex 1, 1978.

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]	
19. Immunologicals *(continued)*			
19.2 *Vaccines*			
19.2.1 *For universal immunization*			
BCG vaccine (dried)		injection	All vaccines should comply with the WHO Requirements for Biological Substances[i]
diphtheria-pertussis-tetanus vaccine		injection	
diphtheria-tetanus vaccine		injection	
measles vaccine		injection	
poliomyelitis vaccine (live attenuated)		oral solution	
tetanus vaccine		injection	
19.2.2 *For specific groups of individuals*			
influenza vaccine		injection	
meningococcal vaccine		injection	
rabies vaccine		injection	
typhoid vaccine		injection	
yellow fever vaccine		injection	
20. Muscle Relaxants (Peripherally Acting) and Cholinesterase Inhibitors			
□neostigmine		tablet, 15 mg (bromide)	
		injection, 0.5 mg (metilsulfate) in 1-ml ampoule	
□gallamine (2)		injection, 40 mg (triethiodide)/ml in 2-ml ampoule	

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

[i] Dried BCG Vaccine (Revised 1978) (WHO Technical Report Series, No. 638, 1979); Diphtheria Toxoid, Pertussis Vaccine, Tetanus Toxoid, and Combined Vaccines (Revised 1978) (WHO Technical Report Series, No. 638, 1979), Addendum 1981 (WHO Technical Report Series, No. 673. 1982); Measles Vaccine (Live) and Measles Vaccine (Inactivated) (WHO Technical Report Series, No. 329. 1966); Poliomyelitis Vaccine (Oral) (Revised 1982) (WHO Technical Report Series, No. 687, 1983); Tetanus Toxoid (Revised 1978) (WHO Technical Report Series, No. 638, 1979); Influenza Vaccine (Inactivated) (Revised 1978) (WHO Technical Report Series, No. 638, 1979); Meningococcal Polysaccharide Vaccine (WHO Technical Report Series, No. 594, 1976), Addendum 1980 (WHO Technical Report Series, No. 658, 1981); Rabies Vaccine for Human Use (Revised 1980) (WHO Technical Report Series, No. 658, 1981); Typhoid Vaccine (WHO Technical Reports Series, No. 361, 1967); Yellow Fever Vaccine (Revised 1975) (WHO Technical Report Series, No. 594, 1976).

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]

20. Muscle Relaxants (Peripherally Acting) and Cholinesterase Inhibitors *(continued)*

suxamethonium (2)		injection, 50 mg (chloride)/ml in 2-ml ampoule
	pyridostigmine (B) (2, 8)	tablet, 60 mg (bromide)
		injection, 1 ml (bromide) in 1-ml ampoule

21. Ophthalmological Preparations

21.1 *Antiinfective agents*

silver nitrate		solution (eye drops), 1%
sulfacetamide		eye ointment, 10% (sodium salt)
		solution (eye drops), 10% (sodium salt)
□tetracycline		eye ointment, 1% (hydrochloride)

21.2 *Antiinflammatory agents*

hydrocortisone (2, 7)		eye ointment, 1% (acetate)

21.3 *Local anaesthetics*

□tetracaine		solution (eye drops), 0.5% (hydrochloride)

21.4 *Miotics*

pilocarpine		solution (eye drops), 2%, 4% (hydrochloride or nitrate)

21.5 *Mydriatics*

□homatropine		solution (eye drops), 2% (hydrobromide)
	epinephrine (A, B) (2)	solution (eye drops), 2% (as hydrochloride)

21.6 *Systemic preparations*

acetazolamide		tablet, 250 mg

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]
22. Oxytocics		
□ergometrine		tablet, 0.2 mg (maleate)
		injection, 0.2 mg (maleate) in 1-ml ampoule
oxytocin		injection, 10 IU in 1-ml ampoule
23. Peritoneal Dialysis Solution		
intraperitoneal dialysis solution (of appropriate composition)		parenteral solution
24. Psychotherapeutic Drugs		
□amitriptyline		tablet, 25 mg (hydrochloride)
□chlorpromazine		tablet, 100 mg (hydrochloride)
		syrup, 25 mg (hydrochloride)/5 ml
		injection, 25 mg (hydrochloride)/ml in 2-ml ampoule
□diazepam		tablet, 5 mg
□fluphenazine (5)		injection, 25 mg (decanoate or enantate) in 1-ml ampoule
□haloperidol		tablet, 2 mg
		injection, 5 mg in 1-ml ampoule
lithium carbonate (2, 4, 7)		capsule or tablet, 300 mg
25. Respiratory Tract, Drugs Acting on the		
25.1 *Antiasthmatic drugs*		
□aminophylline		tablet, 200 mg
		injection, 25 mg/ml in 10-ml ampoule
epinephrine		injection, 1 mg (as hydrochloride) in 1-ml ampoule
□salbutamol		tablet, 4 mg (sulfate)
		oral inhalation (aerosol), 0.1 mg per dose
		syrup, 2 mg (sulfate)/5 ml

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]
25. Respiratory Tract, Drugs Acting on the *(continued)*		
25.1 *Antiasthmatic drugs* (continued)		
	beclometasone (B) (8)	oral inhalation (aerosol), 0.05 mg (dipropionate) per dose
	cromoglicic acid (B) (2, 8)	oral inhalation (cartridge), 20 mg (sodium salt) per dose
	ephedrine (A)	tablet, 30 mg (as hydrochloride)
		elixir, 15 mg (as hydrochloride)/5 ml
		injection, 50 mg (sulfate) in 1-ml ampoule
25.2 *Antitussives*		
□codeine (1)		tablet, 10 mg (phosphate)
26. Solutions Correcting Water, Electrolyte and Acid-base Disturbances		
26.1 *Oral*		
oral rehydration salts (for glucose-salt solution)		[for composition, see 17.6.2: *Replacement solution*]
potassium chloride		oral solution
26.2 *Parenteral*		
□compound solution of sodium lactate		injectable solution
glucose		injectable solution, 5% isotonic, 50% hypertonic
glucose with sodium chloride		injectable solution, 4% glucose, 0.18% sodium chloride (Na^+ 30 mmol/l, Cl^- 30 mmol/l)
potassium chloride		injectable solution
sodium bicarbonate		injectable solution, 1.4% isotonic (Na^+ 167 mmol/l, HCO_3^- 167 mmol/l)
sodium chloride		injectable solution, 0.9% isotonic (Na^+ 154 mmol/l, Cl^- 154 mmol/l)
water for injection		in 2-ml, 5-ml, 10-ml ampoules

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

Main list	*Complementary list*	*Route of administration, dosage forms, and strengths*[a]
	27. Vitamins and Minerals	
ascorbic acid		tablet, 50 mg
□ergocalciferol		capsule or tablet, 1.25 mg (50 000 IU)
		oral solution, 0.25 mg/ml (10 000 IU)
□nicotinamide		tablet, 50 mg
pyridoxine		tablet, 25 mg (hydrochloride)
retinol		capsule or tablet, 7.5 mg (25 000 IU), 60 mg (200 000 IU)*j*
		oral solution, 15 mg/ml (50 000 IU)
riboflavin		tablet, 5 mg
sodium fluoride (8)		tablet, 0.5 mg (as fluoride)
thiamine		tablet, 50 mg (hydrochloride)
	calcium gluconate (c) (2, 8)	injection, 100 mg/ml in 10-ml ampoule

[a] When the strength is specified in terms of a selected salt or ester, this is mentioned in brackets; when it refers to the active moiety, the name of the salt or ester in brackets is preceded by the word "as".

j For use in the treatment and prophylaxis of xerophthalmia.

ALPHABETICAL LIST OF ESSENTIAL DRUGS[1]

[1] International nonproprietary names have been used whenever these are available; see footnote 3 on page 8.

11. CHANGES MADE IN REVISING THE MODEL LIST

Amendments to the individual entries in the model list are detailed below. In addition, some of the broad groups, shown in bold type in the list, have been revised (e.g., group 2 now comprises groups 2

and 3 of the previous list) and have been renumbered in consequence. The meanings of the typographical symbols used and of the numbers in parentheses following the drug names are not all the same as in the previous list (see Explanatory Notes in section 10). To avoid confusion, users are therefore urged to refer only to the present list and to cite the the number of the report in which it is published (WHO Technical Report Series, No. 685).

Group 3. Antiallergics: An injectable formulation of □chlorphenamine is added.

Group 4.1. Antidotes and Other Substances Used in Poisonings. General: □Sodium sulfate is incorporated as an osmotic purgative.

Group 6.1. Anthelmintic drugs: Pyrantel embonate is added to the main list as both a chewable tablet and an oral suspension. □Mebendazole is qualified with a square symbol. Bephenium hydroxynaphthoate is deleted.

Group 6.2. Antiamoebic drugs: Chloroquine is added and diloxanide is transferred to the main list. Dehydroemetine replaces emetine in the complementary list, and note (A) is deleted. Paromomycin is deleted.

Group 6.3.1. Penicillins: Procaine benzylpenicillin is transferred to the main list.

Group 6.3.2. Other antibacterial agents: Spectinomycin injection and an injectable formulation and suppository of □metronidazole are added to the main list. The square symbol is added to □chloramphenicol, □gentamicin, □metronidazole, and □sulfamethoxazole + trimethoprim.

Group 6.3.3. Antileprosy drugs: A 50-mg tablet of dapsone is added. Clofazimine and rifampicin are transferred to the main list. Ethionamide and protionamide are added as complementary drugs.

Group 6.3.4. Antituberculosis drugs: Pyrazinamide and thioacetazone + isoniazid are added to the main list.

Group 6.5. Antifungal drugs: A pessary formulation of nystatin and an injectable formulation of flucytosine are added.

Group 6.7. Antimalarial drugs: Amodiaquine suspension is added to the complementary list. Pyrimethamine as a single-component drug and the formiate salt of quinine are deleted.

Group 6.8. Antischistosomal drugs: Praziquantel is added to the main list. Niridazole, antimony sodium tartrate, and sodium stibocaptate are deleted.

Group 6.9. Antitrypanosomal drugs: □Nifurtimox is transferred to the complementary list and a square symbol added.

Group 9. Antiparkinsonism Drugs: □Biperiden in both tablet and injectable forms replaces trihexyphenidyl in the main list. Levodopa + □carbidopa is transferred to the main list, while levodopa is moved to the complementary list.

Group 10.1 Antianaemia drugs: An oral solution of a ferrous salt is added to the main list. A combined tablet of ferrous salt + folic acid is added as a complementary drug.

Group 10.2. Anticoagulants and antagonists: A formulation of heparin containing 5000 IU/ml is added.

Group 11.2. Plasma fractions for specific uses: Fibrinogen and plasma protein injectable solution are deleted from the complementary list.

Group 12.1. Antianginal drugs: □Verapamil is added to the main list in tablet and injectable formulations.

Group 12.2. Antiarrhythmic drugs: Isoprenaline is added to the main list in a tablet formulation. A 250-mg tablet of procainamide is added.

Group 12.3. Antihypertensive drugs: An 80-mg tablet of □propranolol is added.

Group 12.5. Drugs used in shock or anaphylaxis: Isoprenaline hydrochloride is removed.

Group 13.3. Antiinflammatory and antipruritic drugs: □Calamine lotion is added.

Group 16. Diuretics: Spironolactone is added in a tablet formulation to the main list.

Group 17.1. Antacids and other antiulcer agents: Cimetidine is added to the main list in tablet and injectable formulations.

Group 18.4. Insulins and other antidiabetic agents: □Glibenclamide is added to the main list.

Group 19.2.1. Vaccines for universal immunization: Smallpox vaccine is deleted.

Group 20. Muscle Relaxants (Peripherally Acting) and Cholinesterase Inhibitors: □Gallamine is introduced to replace tubocurarines.

Group 25.2. Antitussives: A square symbol is added to □codeine.

Group 26. Solutions Correcting Water, Electrolyte and Acid-base Disturbances: A square symbol is added to □compound solution of sodium lactate.

Group 27. Vitamins and Minerals: Note (8) is added to sodium fluoride tablet 0.5 mg (as fluoride).

12. ESSENTIAL DRUGS AND PRIMARY HEALTH CARE

12.1 Factors affecting the selection of drugs for primary health care

The first report of the Expert Committee on the Selection of Essential Drugs recommended the compilation of a separate list of drugs appropriate for use in primary health care. After broad consultation, and having regard to situations in which a traditional healer or community health worker rather than a qualified doctor is the patients' first point of reference, the present Expert Committee has selected 22 substances or types of substance from the main list that might be considered for this purpose. They are listed in section 12.2. It cannot be emphasized too strongly that, in practice, the selection must be determined nationally since the training and responsibilities of these workers vary within wide limits. The following considerations, however, will inevitably influence the content of the list.

(1) *Existing systems of medicine.* The establishment of primary health care services should not result in abrupt disruption of prevailing cultural patterns in rural communities, but the work of traditional healers should be adapted and supplemented in such a way as to ensure that innovation is successfully integrated into existing systems of care.

(2) *The national health infrastructure.* The type of primary health care service that a country requires is dependent upon the proximity and nature of the first referral facilities. It is still not unusual in some countries for the nearest permanently manned health post to be one or more days' travelling time from isolated villages in its catchment area.

(3) *Training and supplies.* The numbers of trained personnel, the facilities placed at their disposal, and the supplies entrusted to them determine both the scope and the limitations of the primary health care system. Workers with one or more years' vocational training can obviously accomplish more than personnel who rely upon an intensive course of practical instruction lasting only a few weeks. But, whatever the circumstances, little can be accomplished unless continuity of essential supplies and information is assured.

(4) *The pattern of endemic disease.* The prevalence of major endemic infections and parasitic diseases may vary from region to region within a country in conformity with climatic, geographical, topographical, social, economic, and occupational factors. Careful planning and, in some cases, epidemiological surveys are required to ensure that the most effective drugs are provided, and to obtain full benefit from limited resources.

12.2 A model list of drugs for primary health care

acetylsalicylic acid
activated charcoal
an antacid
an antihaemorrhoidal drug
atropine (antispasmodic)
benzoic acid + salicylic acid
benzyl benzoate
calamine lotion
chlorhexidine solution
chloroquine
chlorphenamine
ephedrine (asthma)
ergometrine (postpartum haemorrhage)
iodine
ipecacuanha
iron/folic acid (nutritional supplement during pregnancy)
lindane
mebendazole
oral rehydration salts
paracetamol
piperazine
tetracycline eye ointment

The selected drugs, which should be available in the dosage forms specified in the main list, can be used effectively and safely by responsible individuals with little formal medical knowledge. The list is adapted to the needs of a malarious area (free from chloroquine resistance) where helminthic infections are also endemic, and the instructions for using the drugs can be based upon the recognition of a few basic clinical signs and symptoms.

Highly trained workers might use a wider range of drugs appropriate to their diagnostic skills with acceptable safety. However, where there is no scarcity of medical manpower, the provision of comprehensive emergency and domiciliary services involves the use of many potent drugs. Decisions regarding the availability of specific drugs to community health workers can be taken only when all the relevant factors that operate locally have been taken into account.

In ideal circumstances antibiotics, for instance, should be used only by individuals with advanced diagnostic skills and with access to appropriate microbiological facilities. However, the need for these drugs is as great in isolated rural communities as elsewhere and health administrators have a prime responsibility to ensure that, as far as possible, basic medical services are brought within the reach of the whole population.

12.3 Training material

The Committee reviewed, and recommended for field testing, a series of draft information sheets relating to the above drugs, with a view to their eventual inclusion in a manual for teachers of community health workers.

13. GLOSSARY OF TERMS USED IN THE REPORT

In the course of its work, the Expert Committee used certain terms with the meanings given below:

Benefit/risk ratio The ratio of benefit to risk in the use of a drug; a means of expressing a judgement concerning the role of the drug in the practice of medicine, based on efficacy and safety data along with consideration of misuse potential, severity and

	prognosis of the disease, etc. The concept may be applied to a single drug or in comparisons between two or more drugs used to treat the same condition.
Bioavailability	The rate and extent of absorption of a drug from a dosage form as determined by the curve of time versus its concentration in the systemic circulation or by measuring its excretion in urine.
Compliance	Faithful adherence by the patient to the prescriber's instructions.
Dosage form	The form of a completed pharmaceutical product, e.g., tablet, capsule, elixir, suppository.
Drug	Any substance used in a pharmaceutical product that is intended to modify or explore physiological systems or pathological states for the benefit of the recipient.
Drug formulation	The composition of a pharmaceutical product or the operations required to produce it.
Drug utilization	The marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences.
Efficacy	The ability of a drug to produce the intended effect as determined by scientific methods.
Excipient	Any component of a finished dosage form other than the therapeutic ingredient or ingredients.
Pharmaceutical product	A dosage form containing one or more drugs along with other substances included during the manufacturing process.
Pharmacokinetics	The study of drug action, particularly with respect to the variation with time of drug concentrations in tissues and of absorption, distribution, metabolism and excretion of drugs and metabolites.

Therapeutic equivalents — Pharmaceutical products which, when administered to the same individuals in the same regimen, will result in essentially the same therapeutic or toxic effects.

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