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# THE USE OF ESSENTIAL DRUGS

Ninth report of the
WHO Expert Committee
(including the revised Model List of Essential Drugs)

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Geneva, 15–19 December 1999

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## 1. Introduction

The WHO Expert Committee on the Use of Essential Drugs met in Geneva from 15 to 19 December 1999. The meeting was opened on behalf of the Director-General by Dr M. Scholtz, Executive Director of Health Technology and Pharmaceuticals, who emphasized that the concept of essential drugs was fundamental to the development of national drug policies. Regular updating of WHO's Model List of Essential Drugs sustained the momentum of WHO's revised drug strategy (*1*), as endorsed by the World Health Assembly in resolution WHA 39.27 in 1986 (*2*), and was a basic element of the validated information required by most of WHO's Member States for optimal rationalization of drug procurement and supply. Dr Scholtz also emphasized the increasing interest in and need for evidence-based decisions in the selection of essential drugs.

The Committee decided to prepare its report as a self-contained document. The eleventh Model List of Essential Drugs will be found in section 12 of the report, and explanations of the changes in section 13.

## 2. The concept 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, and at a price that individuals and the community can afford. This concept is intended to be flexible and adaptable to many different situations; exactly which drugs are regarded as essential remains a national responsibility.

Model lists have proved to be invaluable in improving the quality of health care and reducing costs (*3*, *4*). Better quality of care is achieved when the list of essential drugs is linked to evidence-based treatment guidelines (*5*), especially when the supply system guarantees the availability of the selected drugs. Treatment guidelines can also focus training and serve as a standard for supervision and medical audit; prescribers become more familiar with the drugs and can better recognize adverse drug reactions. Lower costs are achieved through selecting cost–effective treatment. A limited range of drugs in the supply system may lead to economies of scale and competition between manufacturers, further reducing the costs.

Market approval of a pharmaceutical product is usually granted on the basis of efficacy, safety and quality and rarely on the basis of a comparison with other products already on the market, or cost. However, in some developing and most developed countries the majority of drug costs are covered by public funds or through health insurance schemes. Most public drug procurement and insurance schemes have mechanisms to limit procurement or reimbursement of drug costs. An evaluation process is therefore necessary, based on a comparison between various drug products and on cost/benefit considerations. The advantage of a new treatment over the existing one is then compared to its extra cost. Such information has proved very helpful in taking informed decisions about the selection of essential drugs. The model list is intended to help with this evaluation.

## 3. The WHO Model List of Essential Drugs

In a report to the Twenty-eighth World Health Assembly in 1975 (*6*), the Director-General pointed out that the selection of essential drugs would depend on the health needs and on the structure and development of the health services of each country. 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. By resolution WHA28.66 (*7*) the Assembly requested the Director-General to advise Member States on the selection and procurement, at reasonable costs, of essential drugs corresponding to their national health needs.

Following wide consultation, an initial Model List of Essential Drugs was included in the first report of the Expert Committee on the Selection of Essential Drugs in 1977 (*8*). This has subsequently been revised and updated in nine further reports (*9–17*). The concept of essential drugs was quickly taken up by Member States: by the end of 1998 about 140 countries had developed their own national lists of essential drugs, often in combination with standard treatment guidelines and stratified according to the level of care. Many countries have also successfully applied the concept to teaching hospitals and facilities providing specialized care. Health insurance schemes increasingly use national lists of essential drugs as a reference.

The concept of essential drugs has also been adopted by numerous international and bilateral agencies that include drug supply and rationalization of drug use in their health care programmes. The model list has also resulted in greater international coordination in health care development, and it is also being used to evaluate whether drug

donations are appropriate in a given situation (*18*). Shorter, adapted lists have proved to be of particular value in emergency situations (*19*, *20*).

Model lists are informational and educational tools for health professionals and consumers. They should be seen in the context of comprehensive national drug policies which address not only drug use but also strategies for drug procurement and supply, drug financing, drug donations, research priorities for drug use and drugs needed for specific diseases.

Although originally intended for developing countries, an increasing number of developed countries also use key components of the essential drugs concept. This development has been triggered by increasing drug costs, the introduction of many new and often expensive drugs, and by the variations observed in the quality of health care.

The way in which national lists of essential drugs are being developed has slightly changed over time. The first lists were often developed as a means to guide the procurement of drugs. In recent years, more emphasis has been placed on the development of treatment guidelines as the basis for drug selection and supply, and on the evidence underlying the development of those treatment guidelines.

These developments have consequences for the role of the model list. While information on the drugs included in the model list is valuable to national drug selection committees, the Committee recognizes that this is no longer sufficient. There is increasing demand for information on why a particular drug is included, with references to the underlying evidence. Activities are now underway to strengthen the links between the model list and treatment guidelines developed by WHO.

The process of developing the model list is intended as an example of the drug evaluation procedure referred to in section 2. It is currently being revised to include a more systematic process of detailed evaluation, including pharmacoeconomic analyses. Not all cost–effective treatments are necessarily affordable, especially in developing countries. In addition, national lists of essential drugs may need to be stratified to reflect skills and requirements at different levels within the health care infrastructure.

The model list now contains many medications which require a high degree of expertise to ensure safe and effective use. Adequate specialist skills and complementary resources are needed before the

introduction of some classes of drugs. Examples of situations where specialist control of drug use is necessary are:

- The use of reserve antimicrobials for multidrug-resistant bacteria.
- Establishing adequate regimens for treatment of tuberculosis and leprosy.
- The use of antineoplastic and immunosuppressive drugs.
- The use of antiretroviral drugs.
- The use of antimicrobial, antifungal and antiviral agents for the treatment of opportunistic infections in immunocompromised patients.

The selection of essential drugs is a continuing process, which should take into account changing public health priorities and epidemiological conditions, as well as progress in pharmacological and pharmaceutical knowledge. It should be accompanied by a concomitant effort to supply information and provide education and training to health personnel in the proper use of the drugs.

The model list should be understood as a tentative identification of a "common core" of basic drugs which has universal relevance and applicability with the full understanding that exclusion does not imply rejection. This does not imply that no other drugs are useful, but simply that these basic drugs, when used in accordance with appropriate therapeutic guidelines, are the most cost-effective for meeting the health care needs of the majority of the population. In certain situations, there is a need to make available additional drugs essential for rare diseases.

## 4. Criteria for the selection of essential drugs

The choice of essential 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.

Because of differing views on the definition of an essential drug in terms of what is meant by the "health care needs of the majority" of the population, the model list has been gradually expanded since its introduction. Some drugs are included that are essential only if a therapeutic programme is planned to address the diseases for which these drugs are used. For example, the cytotoxic drugs (section 8.2 of the model list) are essential only if a comprehensive cancer treatment programme is planned. Such a programme requires adequate hospital, diagnostic and clinical laboratory facilities for its implementation.

In contrast, the drugs used in palliative care (section 8.4) are always essential, even when a comprehensive cancer treatment programme does not exist.

The selection of essential drugs must always be based on valid scientific evidence. Only those drugs should be selected for which sound and adequate data on efficacy and safety are available from clinical studies.

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 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. The cost/benefit ratio is a major consideration in the choice of some drugs for the list. 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.

Most 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 has a proven advantage over single compounds administered separately in therapeutic effect, safety or compliance.

At its previous meetings, the Committee did not always require a review of all the available evidence. For example, recommendations by WHO programmes were often accepted based on the assurance of the programme that appropriate evidence had been received and was considered to be adequate. At its present meeting, the Committee required that a summary of the appropriate evidence be presented for review. When such evidence was not available, action on a request was deferred or the proposed change was rejected, with a request that supporting evidence be presented with the proposed change at the next meeting of the Committee. The urgency of some of the proposals was such that action was required at this meeting even though a systematic review of the evidence was unavailable. For these proposals, action was taken based on the information that was available and the best judgement of the Committee.

## 5. 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 cost 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 where there is no uniformity of tablet strength (for example acetylsalicylic acid and paracetamol), a dosage range is provided from within which suitable tablet 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 many instances, dosage is specified in terms of a selected salt or ester, but in others (for example chloroquine) it is calculated, in accordance with common practice, in terms of the active moiety.

For certain drugs with short half-lives that are rapidly metabolized, such as carbamazepine, calcium-channel blockers and theophylline, conventional-release dosage forms must often be taken three or four times a day to maintain drug levels in the required narrow range. Sustained-release dosage forms can reduce the frequency of drug administration, thereby improving compliance and, often, the therapeutic effectiveness of the drug by maintaining a more constant drug level than can be obtained using traditional dosage forms. Because the preparation of sustained-release products is difficult and requires special expertise, a proposal to include such a product in a national list of essential drugs should be justified by adequate documentation.

## 6. Quality assurance

Priority should be given to ensuring that the available drugs have been made according to good manufacturing practices (*21*, Annex 1)

and are of generally recognized quality. This requires knowledge of and confidence in the origin of the product. The risks of procuring drugs from anonymous sources cannot be overstressed. It is recommended that drugs be purchased directly from known manufacturers, their duly accredited agents or recognized international agencies known to apply high standards in selecting their suppliers.

Quality assurance of drugs, as embodied in product development, good manufacturing practice and subsequent monitoring of quality throughout the distribution chain to utilization, is a crucial element in any essential drug programme. The Committee wished to highlight the importance of the bioavailability of drugs in the assessment of their quality. All aspects of these procedures have been dealt with at length in the twenty-sixth to thirty-fifth reports of the WHO Expert Committee on Specifications for Pharmaceutical Preparations (*21–30*).

## 7. Pharmacovigilance

Little is known about the clinical consequences of different prescribing patterns between countries or between regions within a country. Systematic and comprehensive data are available on the use of drugs after they have been marketed, but it is recognized that such data are often not used to their full potential or in accordance with generally accepted criteria. Moreover, data on the effects of overdose and uncommon or long-term adverse effects are usually not available at the time of registration. To optimize the usefulness and/or benefits of drugs in actual use, continuing pharmacovigilance is needed.[1]

## 8. Drug utilization studies

The Committee recognized the importance of drug utilization studies. WHO recommends that such studies be conducted using the Anatomical Therapeutic Chemical (ATC) classification system and the Defined Daily Dose (DDD) as a measuring unit (*31*). The purpose of the ATC/DDD system is to serve as a tool for drug utilization research in order to improve the quality of drug use. Access to standardized and validated information on drug use is essential to allow audit

[1] For further information, contact the WHO Collaborating Centre for International Drug Monitoring, Stova tovget 3, S-753 Uppsala, Sweden. (Tel.: +46 (18) 656060; fax: +46 (18) 656080; e-mail: info@who-umc.org.)

of patterns of drug utilization, identification of problems, and monitoring of the outcomes of educational or other interventions.

The ATC classification system was originally developed and is maintained by the WHO Collaborating Centre for Drug Statistics Methodology. The model list has recently been classified using the ATC system and is available on request from the Collaborating Centre.[1]

## 9. Reserve anti-infective agents

The increasing prevalence of strains of common pathogenic bacteria resistant to widely available, relatively cheap antimicrobials included in the model list is, in many cases, dangerously eroding their effectiveness.

It is becoming increasingly common for important pathogens to emerge in a country or locality that are shown, on susceptibility testing, to have developed resistance to all normally appropriate essential drugs. In these circumstances a reserve antimicrobial is needed. A reserve antimicrobial is an antimicrobial that is useful for a wide range of infections but, because of the need to reduce the risk of development of resistance and because of its relatively high cost, it would be inappropriate to recommend its unrestricted use.

The concept of reserve antimicrobials is of practical relevance only when information is available on the prevailing susceptibilities of important bacterial pathogens. Many schemes have been initiated for laboratory-based monitoring of resistance to antimicrobials but there is a need for international coordination. It has already been emphasized that reference laboratories need to be established in developing as well as developed countries in order to monitor the resistance of important bacterial pathogens (*32*, *33*). Knowledge of prevailing susceptibility patterns is vital to the selection and use of antimicrobials and to the development of appropriate prescribing policies. Without these data the health of seriously ill patients could be jeopardized. Knowledge of susceptibility patterns should come from proper laboratory investigations. Research directed towards improving the link between the results of laboratory testing and prescribing policies is needed. Decisions on drug use should be taken on the basis of standardized therapeutic efficacy testing.

[1] For further information, contact the WHO Collaborating Centre for Drug Statistics Methodology, PO Box 100, Vietvet, N-0518 Oslo, Norway. (Tel.: +47 22169811; fax: +47 22169818; e-mail: whocc@nmd.no.)

The finding of high levels of resistance to rifampicin + isoniazid, known as multidrug-resistant tuberculosis, in some countries or localities emphasizes the need for the use of second-line anti-tuberculosis drugs in such locations. However, WHO strongly recommends that the prescription and use of such drugs be restricted to specialized centres with well trained staff and appropriate facilities as defined in the WHO guidelines for DOTS (directly observed treatment, short course)-Plus programmes for treatment of multidrug-resistant tuberculosis and be based on scientifically justified treatment regimens (*34*, *35*). These drugs must not be made available outside the public sector, and should be under the strict control of governmental DOTS-Plus pilot projects. Such projects should be implemented only in areas with successful DOTS programmes for tuberculosis control.

The Committee considered the following drugs and formulations essential for the treatment of multidrug-resistant tuberculosis, as defined above:

- amikacin: powder for injection, 1000 mg in vial
- *p*-aminosalicylic acid: tablet, 500 mg; granules, 4 g in sachet
- capreomycin: powder for injection, 1000 mg in vial
- ciprofloxacin: tablet, 250 mg, 500 mg
- □cycloserine: capsule or tablet, 250 mg
- □ethionamide: tablet, 125 mg, 250 mg
- kanamycin: powder for injection, 1000 mg in vial
- levofloxacin: tablet, 250 mg, 500 mg
- ofloxacin: tablet, 200 mg, 400 mg.

In some countries, strains of *Plasmodium falciparum* have developed resistance to all of the antimalarial drugs except for artemisinin and its derivatives. For patients with falciparum malaria resistant to chloroquine, sulfadoxine + pyrimethamine, mefloquine, or quinine with tetracycline, the use of artemisinin and its derivatives appears essential. In order to limit the development of resistance to these drugs and keep them effective for as long as possible, their use should be restricted to areas in which multidrug-resistant falciparum malaria exists. In such countries artemisinin and its derivatives should be used for the treatment of uncomplicated infections resistant to all other antimalarials, or for severe falciparum malaria where quinine is ineffective. The Committee recognizes the importance of using artemisinin and its derivatives in combination with other antimalarial drugs to help address the problem of drug resistance (*36*).

□ Example of a therapeutic group.

The need for the discovery and development of new anti-infective drugs, especially for those diseases mainly prevalent in developing countries, continues to be of high priority.

## 10. Drug information and educational activities

For the safe, effective and prudent use of essential drugs, relevant and reliable drug information should be available.

Health care professionals should receive education about the use of drugs not only during their initial professional training but also throughout their professional careers. The more highly trained individuals should be encouraged to assume a responsibility to educate those with less training. Pharmacists and other health care workers responsible for dispensing drugs should accept every opportunity to inform consumers about the rational use of these products, including those for self-medication, at the time they are dispensed.

The Committee recommended that comprehensive educational programmes for health care professionals include:

— diagnostic and therapeutic guidelines for common conditions and for uncommon conditions recognized as important, such as poisoning;
— training in prescribing skills (*37*);
— accurate and understandable drug information and information on all aspects of medical care in which they are involved;
— information about patterns of disease in the community, especially prevailing sensitivity patterns, to aid in the selection of antimicrobial drugs.

Governments, universities and professional associations have a major responsibility to collaborate on improving undergraduate, postgraduate and continuing education in clinical pharmacology, therapeutics and drug information issues.

Appropriate drug information that is well presented is cost-effective in that it ensures that drugs are used properly and decreases inappropriate drug use; drug information activities should be financed from the national budget for the provision of drugs.

### *Drug information sheets*

The following is an example of a format for supplying information to prescribers to facilitate the safe and effective use of drugs. The con-

tent should be adjusted to the needs, knowledge and responsibilities of the prescriber.

1. The International Nonproprietary Name (INN) of each active substance. The need to identify each pharmaceutical substance by a unique, globally recognized generic name is of critical importance in facilitating communication as well as in the labelling and advertising of medicinal products in international commerce.

2. Pharmacological data: a brief description of pharmacological properties and mechanism of action.

3. Clinical information:
   (a) Indications: whenever appropriate, simple diagnostic criteria should be provided.
   (b) Dosage regimen and relevant pharmacokinetic data:
      — average and range for adults and children;
      — dosing interval;
      — average duration of treatment;
      — special situations, e.g. renal, hepatic, cardiac or nutritional insufficiencies that require either an increased or a reduced dosage.
   (c) Contraindications.
   (d) Precautions and warnings (reference to pregnancy, lactation, etc.).
   (e) Adverse effects (quantify by category, if possible).
   (f) Drug interactions (include only if clinically relevant; drugs used for self-medication should be included).
   (g) Overdosage:
      — brief clinical description of symptoms;
      — non-drug treatment and supportive therapy;
      — specific antidotes.

4. Pharmaceutical information:
   (a) Dosage forms.
   (b) Strength of dosage form.
   (c) Storage conditions and shelf-life (expiry date).

The Committee also recognized the need for appropriate drug information sheets for consumers.

## 11. Future developments

The Committee reviewed the experience with the original model list and the subsequent revisions, as well as the future needs of the model

list. It concluded that the model list has played an important role in establishing and promoting the concept of essential drugs. The model list has been adopted and adapted globally. Both the methodology of the process for selecting drugs for inclusion in the list and the list itself serve as useful models. The Committee then reviewed how these two uses of the list could best be served in the future.

With regard to the process of selection of essential drugs, the Committee endorsed WHO's efforts to link the selection of drugs on the model list to its guidelines for treatment and recommended that this approach be continued, to the extent possible, in order to facilitate the implementation of such guidelines. The Committee also expressed its support for WHO's efforts to develop evidence-based guidelines for the treatment of diseases and recognized the value of this activity.

The Committee agreed that its decisions on whether to include drugs in the model list should be based on properly identified evidence. Proposals to include drugs in the model list submitted to the Committee should be better defined, and should include a valid analysis of the cost-effectiveness of each drug. The reasons for the Committee's final decision should be carefully recorded.

With regard to the model list, the Committee concluded that the list should indicate priority conditions and drugs for which equitable availability and affordability should be ensured before resources are spent on other treatments. In addition to this core list, a special identification should indicate drugs that are cost-effective and safe, but which are not necessarily affordable and for which special training or health care services would be needed for their proper use.

The Committee also welcomed suggestions that the available evidence supporting the inclusion of drugs already on the model list be identified and made available, and agreed that a number of therapeutic groups would benefit from a general review. It was recognized that there are some drugs on the model list that are used to treat uncommon conditions, while drugs effective in treating other uncommon conditions are not included. The Committee was not able to identify the basis on which decisions to include or exclude drugs had been made, but noted that factors such as the frequency, severity and subjective perception of the importance of the condition and the efficacy of treatment had been used to varying degrees. The Committee decided that it was not appropriate to review this aspect of the list at the present meeting.

The Committee discussed the need for more explicit criteria for determining which diseases or conditions are appropriately included in the "health needs of the majority" and for which medication should be provided in the model list. Similarly, clearer descriptions are needed of the criteria for selecting drugs to be included in the model list. Recognizing the desirability of making the basis of its decision-making more transparent and taking into account recent technological advances in making clinical decisions such as the systematic reviews published by the Cochrane Collaboration, which are collectively referred to as evidence-based medicine, the Committee recommended that the methodology for its decision-making be reviewed as a matter of urgency. Following this review, a methodology for use by the Committee should be prepared, which should include a description of the process for submitting a proposal to include a drug in the model list. The Committee noted that resources would be required to implement these recommendations.

## 12. Model List of Essential Drugs (eleventh list)

### *Explanatory notes*[1]

Many drugs included in the list are preceded by a square symbol (□) to indicate that they represent an *example of a therapeutic group* and that various drugs could serve as alternatives. It is imperative that this is understood when drugs are selected at national level, since 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 in adults, such as loperamide.
- □ 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).
- □ Sulfadiazine: any other short-acting, systemically active sulfonamide unlikely to cause crystalluria.

Numbers in parentheses following the drug names indicate:

[1] The numbers preceding the drug sections and subsections in the model list have, in general, been allocated in accordance with English alphabetical order; they have no formal significance. The various formulations are listed in order of priority.

(1) Drugs subject to international control under: (a) the Single Convention on Narcotic Drugs, 1961 (*38*); (b) the Convention on Psychotropic Substances, 1971 (*39*); or (c) the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, 1988 (*40*).
(2) Specific expertise, diagnostic precision, individualization of dosage or special equipment required for proper use.
(3) Greater potency or efficacy.
(4) In renal insufficiency, contraindicated or dosage adjustments necessary.
(5) To improve compliance.
(6) Special pharmacokinetic properties.
(7) Adverse effects diminish benefit/risk ratio.
(8) Limited indications or narrow spectrum of activity.
(9) For epidural anaesthesia.
(10) Sustained-release preparations are available. A proposal to include such a product in a national list of essential drugs should be supported by adequate documentation.
(11) Monitoring of therapeutic drug concentrations (in plasma) can be used to improve safety and efficacy.

Letters in parentheses after 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.

Certain pharmacological effects have many therapeutic uses. Drugs with these effects could be listed in many different therapeutic categories in the model list. However, the inclusion of such drugs in more than one therapeutic category has been limited to circumstances that the Committee wished to emphasize. Drugs in the model list are therefore not necessarily listed in each of the therapeutic categories in which they are of value. Information on therapeutic use is or will be available in the *WHO model formulary* (*41*), the *WHO model prescribing information* publications (*42–47*) and several other WHO publications (*48–50*). In addition, essential drugs could be categorized by whether their use is to treat a life-threatening illness, to minimize or prevent a disability, or to improve the quality of life. This system is not used here, however, since the Committee considered all of these uses to be essential for proper therapeutics. It is necessary for individual countries to specify which drugs have priority in their country.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **1. Anaesthetics** | |
| **1.1 *General anaesthetics and oxygen*** | |
| ether, anaesthetic (1c, 2) | inhalation |
| halothane (2) | inhalation |
| ketamine (2) | injection, 50 mg (as hydrochloride)/ml in 10-ml vial |
| 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 |
| | injection for spinal anaesthesia, 0.5% (hydrochloride) in 4-ml ampoule to be mixed with 7.5% glucose solution |
| □ lidocaine | injection, 1%, 2% (hydrochloride) in vial |
| | injection, 1%, 2% (hydrochloride) + epinephrine 1:200000 in vial |
| | injection for spinal anaesthesia, 5% (hydrochloride) in 2-ml ampoule to be mixed with 7.5% glucose solution |
| | topical forms, 2–4% (hydrochloride) |
| | dental cartridge, 2% (hydrochloride) + epinephrine 1:80000 |
| *Complementary drug* | |
| ephedrine[b] (C) | injection, 30 mg (hydrochloride)/ml in 1-ml ampoule |
| **1.3 *Preoperative medication and sedation for short-term procedures*** | |
| atropine | injection, 1 mg (sulfate) in 1-ml ampoule |
| chloral hydrate | syrup, 200 mg/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".

[b] For use in spinal anaesthesia during delivery, to prevent hypotension.

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **1. Anaesthetics** (*continued*) | |
| **1.3 *Preoperative medication and sedation for short-term procedures*** (*continued*) | |
| □ diazepam (1b) | injection, 5 mg/ml in 2-ml ampoule |
| | tablet, 5 mg |
| □ morphine (1a) | injection, 10 mg (sulfate or hydrochloride) in 1-ml ampoule |
| □ promethazine | elixir or syrup, 5 mg (hydrochloride)/5 ml |
| **2. Analgesics, antipyretics, nonsteroidal anti-inflammatory drugs, drugs used to treat gout and disease-modifying agents used in rheumatic disorders** | |
| **2.1 *Non-opioid analgesics and antipyretics and nonsteroidal anti-inflammatory drugs*** | |
| acetylsalicylic acid | tablet, 100–500 mg |
| | suppository, 50–150 mg |
| □ ibuprofen | tablet, 200 mg, 400 mg |
| paracetamol | tablet, 100–500 mg |
| | suppository, 100 mg |
| | syrup, 125 mg/5 ml |
| **2.2 *Opioid analgesics*** | |
| □ codeine (1a) | tablet, 30 mg (phosphate) |
| □ morphine (1a) | injection, 10 mg (hydrochloride or sulfate) in 1-ml ampoule |
| | oral solution, 10 mg (hydrochloride or sulfate)/5 ml |
| | tablet, 10 mg (sulfate) |
| *Complementary drug* | |
| □ pethidine (A) (1a, 4) | injection, 50 mg (hydrochloride) in 1-ml ampoule |
| | tablet, 50 mg, 100 mg (hydrochloride) |
| **2.3 *Drugs used to treat gout*** | |
| allopurinol (4) | tablet, 100 mg |
| colchicine (7) | tablet, 500 µg |

[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".

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **2. Analgesics, antipyretics, nonsteroidal anti-inflammatory drugs, drugs used to treat gout and disease-modifying agents used in rheumatic disorders** (*continued*) | |
| **2.4 *Disease-modifying agents used in rheumatic disorders*** | |
| azathioprine (2) | tablet, 50 mg |
| chloroquine (2) | tablet, 100 mg, 150 mg (as phosphate or sulfate) |
| cyclophosphamide (2) | tablet, 25 mg |
| methotrexate (2) | tablet, 2.5 mg (as sodium salt) |
| penicillamine (2) | capsule or tablet, 250 mg |
| sulfasalazine (2) | tablet, 500 mg |
| **3. Antiallergics and drugs used in anaphylaxis** | |
| □ chlorphenamine | tablet, 4 mg (hydrogen maleate) |
| | injection, 10 mg (hydrogen maleate) in 1-ml ampoule |
| □ dexamethasone | tablet, 500 µg, 4 mg |
| | injection, 4 mg dexamethasone phosphate (as disodium salt) in 1-ml ampoule |
| epinephrine (adrenaline) | injection, 1 mg (as hydrochloride or hydrogen tartrate) in 1-ml ampoule |
| hydrocortisone | powder for injection, 100 mg (as sodium succinate) in vial |
| □ prednisolone | tablet, 5 mg |
| **4. Antidotes and other substances used in poisonings** | |
| **4.1 *Non-specific*** | |
| □ charcoal, activated | powder |
| ipecacuanha | syrup, containing 0.14% ipecacuanha alkaloids calculated as emetine |

[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".

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **4. Antidotes and other substances used in poisonings** (*continued*) | |
| **4.2 *Specific*** | |
| acetylcysteine | injection, 200 mg/ml in 10-ml ampoule |
| atropine | injection, 1 mg (sulfate) in 1-ml ampoule |
| calcium gluconate (2, 8) | injection, 100 mg/ml in 10-ml ampoule |
| deferoxamine | powder for injection, 500 mg (mesilate) in vial |
| dimercaprol (2) | injection in oil, 50 mg/ml in 2-ml ampoule |
| □ DL-methionine | tablet, 250 mg |
| methylthioninium chloride (methylene blue) | injection, 10 mg/ml in 10-ml ampoule |
| naloxone | injection, 400 µg (hydrochloride) in 1-ml ampoule |
| penicillamine (2) | capsule or tablet, 250 mg |
| potassium ferric hexacyanoferrate (II)·$2H_2O$ (Prussian blue) | powder for oral administration |
| 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 |
| **5. Anticonvulsants/antiepileptics** | |
| carbamazepine (10, 11) | scored tablet, 100 mg, 200 mg |
| □ diazepam (1b) | injection, 5 mg/ml in 2-ml ampoule (intravenous or rectal) |
| ethosuximide | capsule, 250 mg |
| | syrup, 250 mg/5 ml |
| magnesium sulfate | injection, 500 mg/ml in 2-ml ampoule, 500 mg/ml in 10-ml ampoule |
| phenobarbital (1b, 11) | tablet, 15–100 mg |
| | elixir, 15 mg/5 ml |
| phenytoin (7, 11) | capsule or tablet, 25 mg, 50 mg, 100 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".

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **5. Anticonvulsants/antiepileptics** (*continued*) | |
| phenytoin (7, 11) | injection, 50 mg (sodium salt)/ml in 5-ml vial |
| valproic acid (7, 11) | enteric coated tablet, 200 mg, 500 mg (sodium salt) |
| *Complementary drug* | |
| □ clonazepam (B) (1b) | scored tablet, 500 µg |
| **6. Anti-infective drugs** | |
| **6.1 *Anthelminthics*** | |
| 6.1.1 *Intestinal anthelminthics* | |
| albendazole | chewable tablet, 400 mg |
| levamisole | tablet, 50 mg, 150 mg (as hydrochloride) |
| □ mebendazole | chewable tablet, 100 mg, 500 mg |
| niclosamide | chewable tablet, 500 mg |
| praziquantel | tablet, 150 mg, 600 mg |
| pyrantel | chewable tablet, 250 mg (as embonate) |
| | oral suspension, 50 mg (as embonate)/ml |
| 6.1.2 *Antifilarials* | |
| diethylcarbamazine | tablet, 50 mg, 100 mg (dihydrogen citrate) |
| ivermectin | scored tablet, 3 mg, 6 mg |
| *Complementary drug* | |
| suramin sodium (B) (2, 7) | powder for injection, 1 g in vial |
| 6.1.3 *Antischistosomals and other antitrematode drugs* | |
| praziquantel | tablet, 600 mg |
| triclabendazole | tablet, 250 mg |
| *Complementary drug* | |
| oxamniquine (C) (8) | capsule, 250 mg |
| | syrup, 250 mg/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".

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **6. Anti-infective drugs** (*continued*) | |
| **6.2 *Antibacterials*** | |
| 6.2.1 *β-Lactam drugs* | |
| □ amoxicillin | capsule or tablet, 250 mg, 500 mg (anhydrous) |
| | powder for oral suspension, 125 mg (anhydrous)/5 ml |
| ampicillin | powder for injection, 500 mg, 1 g (as sodium salt) in vial |
| benzathine benzylpenicillin | powder for injection, 1.44 g benzylpenicillin (= 2.4 million IU) in 5-ml vial |
| benzylpenicillin | powder for injection, 600 mg (= 1 million IU), 3 g (= 5 million IU) (sodium or potassium salt) in vial |
| □ cloxacillin | capsule, 500 mg, 1 g (as sodium salt) |
| | powder for oral solution, 125 mg (as sodium salt)/5 ml |
| | powder for injection, 500 mg (as sodium salt) in vial |
| phenoxymethylpenicillin | tablet, 250 mg (as potassium salt) |
| | powder for oral suspension, 250 mg (as potassium salt)/5 ml |
| procaine benzylpenicillin | powder for injection, 1 g (= 1 million IU), 3 g (= 3 million IU) in vial |
| *Restricted indications* | |
| □ amoxicillin + □ clavulanic acid | tablet, 500 mg + 125 mg |
| ceftazidime | powder for injection, 250 mg (as pentahydrate) in vial |
| □ ceftriaxone | powder for injection, 250 mg (as sodium salt) in vial |
| imipenem + cilastatin | powder for injection, 250 mg (as monohydrate) + 250 mg (as sodium salt), 500 mg (as monohydrate) + 500 mg (as sodium salt) 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".

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **6. Anti-infective drugs** (*continued*) | |
| **6.2 *Antibacterials*** (*continued*) | |
| 6.2.2 *Other antibacterials* | |
| □ chloramphenicol (7) | capsule, 250 mg |
| | oral suspension, 150 mg (as palmitate)/5 ml |
| | powder for injection, 1 g (as sodium succinate) in vial |
| □ ciprofloxacin | tablet, 250 mg (as hydrochloride) |
| □ doxycycline (5, 6) | capsule or tablet, 100 mg (hydrochloride) |
| □ erythromycin | capsule or tablet, 250 mg (as stearate or ethyl succinate) |
| | powder for oral suspension, 125 mg (as stearate or ethyl succinate) |
| | powder for injection, 500 mg (as lactobionate) in vial |
| □ gentamicin (2, 4, 7, 11) | injection, 10 mg, 40 mg (as sulfate)/ml in 2-ml vial |
| □ metronidazole | tablet, 200–500 mg |
| | injection, 500 mg in 100-ml vial |
| | suppository, 500 mg, 1 g |
| | oral suspension, 200 mg (as benzoate)/5 ml |
| nalidixic acid (8) | tablet, 250 mg, 500 mg |
| nitrofurantoin (4, 8) | tablet, 100 mg |
| spectinomycin (8) | powder for injection, 2 g (as hydrochloride) in vial |
| □ sulfadiazine (4) | tablet, 500 mg |
| | injection, 250 mg (sodium salt) in 4-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".

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **6. Anti-infective drugs** (*continued*) | |
| **6.2 *Antibacterials*** (*continued*) | |
| 6.2.2 *Other antibacterials* (*continued*) | |
| □ sulfamethoxazole + trimethoprim (4) | tablet, 100 mg + 20 mg, 400 mg + 80 mg |
| | oral suspension, 200 mg + 40 mg/5 ml |
| | injection, 80 mg + 16 mg/ml in 5-ml ampoule, 80 mg + 16 mg/ml in 10-ml ampoule |
| trimethoprim (8) | tablet, 100 mg, 200 mg |
| | injection, 20 mg/ml in 5-ml ampoule |
| *Complementary drugs* | |
| chloramphenicol (C) | oily suspension, 0.5 g (as sodium succinate)/ml in 2-ml ampoule |
| clindamycin (B) (8) | capsule, 150 mg |
| | injection, 150 mg (as phosphate)/ml |
| *Restricted indications* | |
| vancomycin | powder for injection, 250 mg (as hydrochloride) in vial |
| 6.2.3 *Antileprosy drugs* | |
| clofazimine | capsule, 50 mg, 100 mg |
| dapsone | tablet, 25 mg, 50 mg, 100 mg |
| rifampicin | capsule or tablet, 150 mg, 300 mg |
| 6.2.4 *Antituberculosis drugs* | |
| ethambutol (4) | tablet, 100–400 mg (hydrochloride) |
| isoniazid | tablet, 100–300 mg |
| isoniazid + ethambutol (5) | tablet, 150 mg + 400 mg |
| pyrazinamide | tablet, 400 mg |
| rifampicin | capsule or tablet, 150 mg, 300 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".

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **6. Anti-infective drugs** (*continued*) | |
| **6.2 *Antibacterials*** (*continued*) | |
| 6.2.4 *Antituberculosis drugs* (*continued*) | |
| rifampicin + isoniazid (5) | tablet, 60 mg + 30 mg, 150 mg + 75 mg, 300 mg + 150 mg, 60 mg + 60 mg,[b] 150 mg + 150 mg[b] |
| rifampicin + isoniazid + pyrazinamide (5) | tablet, 60 mg + 30 mg + 150 mg, 150 mg + 75 mg + 400 mg, 150 mg + 150 mg + 500 mg[b] |
| rifampicin + isoniazid + pyrazinamide + ethambutol | tablet, 150 mg + 75 mg + 400 mg + 275 mg |
| streptomycin (4) | powder for injection, 1 g (as sulfate) in vial |
| *Complementary drug* | |
| thioacetazone + isoniazid (A) (5, 7) | tablet, 50 mg + 100 mg, 150 mg + 300 mg |
| *Restricted indications* | |
| For drugs used in the treatment of multidrug-resistant tuberculosis, see section 9 of the main text. | |
| **6.3 *Antifungal drugs*** | |
| amphotericin B (4) | powder for injection, 50 mg in vial |
| □ fluconazole | capsule, 50 mg |
| | injection, 2 mg/ml in vial |
| | oral suspension, 50 mg/5 ml |
| griseofulvin (7) | capsule or tablet, 125 mg, 250 mg |
| nystatin | tablet, 100 000 IU, 500 000 IU |
| | lozenge, 100 000 IU |
| | pessary, 100 000 IU |
| *Complementary drugs* | |
| flucytosine (B) (4, 8) | capsule, 250 mg |
| | infusion, 2.5 g in 250 ml |
| potassium iodide (A) | saturated solution |

[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] For intermittent use three times weekly.

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **6. Anti-infective drugs** (*continued*) | |
| **6.4 *Antiviral drugs*** | |
| 6.4.1 *Antiherpes drugs* | |
| aciclovir (8) | tablet, 200 mg |
| | powder for injection, 250 mg (as sodium salt) in vial |
| 6.4.2 *Antiretroviral drugs*[b] | |
| nevirapine (8) | tablet, 200 mg |
| | oral solution, 50 mg/5 ml |
| zidovudine (8) | capsule, 100 mg |
| | tablet, 250 mg |
| | injection, 10 mg/ml in 20-ml vial |
| | oral solution, 50 mg/5 ml |

Drugs for the treatment of human immunodeficiency virus (HIV) infection/acquired immunodeficiency syndrome (AIDS) include nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors and protease inhibitors. The drugs zidovudine and nevirapine have been shown to reduce or prevent mother-to-child transmission of HIV. *This is the only indication for which they are included here.* Single drug use with zidovudine, except in pregnancy, is now regarded as obsolete, because of the development of resistance. Triple therapy is beyond the budgets of most national drug programmes and therefore HIV/AIDS treatment policies must be decided at country or institutional level.

| | |
|---|---|
| **6.5 *Antiprotozoal drugs*** | |
| 6.5.1 *Antiamoebic and antigiardiasis drugs* | |
| □ diloxanide | tablet, 500 mg (furoate) |
| □ metronidazole | tablet, 200–500 mg |
| | injection, 500 mg in 100-ml vial |
| | oral suspension, 200 mg (as benzoate)/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".

[b] For use only where adequate resources and specialist care are available.

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **6. Anti-infective drugs** (*continued*) | |
| **6.5 *Antiprotozoal drugs*** (*continued*) | |
| 6.5.2 *Antileishmaniasis drugs* | |
| □ meglumine antimoniate | injection, 30%, equivalent to approx. 8.5% antimony, in 5-ml ampoule |
| pentamidine (5) | powder for injection, 200 mg, 300 mg (isetionate) in vial |
| *Complementary drug* | |
| amphotericin B (B) (4) | powder for injection, 50 mg in vial |
| 6.5.3 *Antimalarial drugs* | |
| *(a) For curative treatment* | |
| □ chloroquine | tablet, 100 mg, 150 mg (as phosphate or sulfate) |
| | syrup, 50 mg (as phosphate or sulfate)/5 ml |
| | injection, 40 mg (as hydrochloride, phosphate or sulfate)/ml in 5-ml ampoule |
| primaquine | tablet, 7.5 mg, 15 mg (as diphosphate) |
| □ quinine | tablet, 300 mg (as bisulfate or sulfate) |
| | injection, 300 mg (dihydrochloride)/ml in 2-ml ampoule |
| *Complementary drugs* | |
| □ doxycycline (B)[b] | capsule or tablet, 100 mg (hydrochloride) |
| mefloquine (B) | tablet, 250 mg (as hydrochloride) |
| □ sulfadoxine + pyrimethamine (B) | tablet, 500 mg + 25 mg |
| *Restricted indications* | |
| artemether | injection, 80 mg/ml in 1-ml ampoule |
| artesunate | tablet, 50 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".

[b] For use only in combination with quinine.

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **6. Anti-infective drugs** (*continued*) | |
| **6.5 *Antiprotozoal drugs*** (*continued*) | |
| 6.5.3 *Antimalarial drugs* (*continued*) | |
| *(b) For prophylaxis* | |
| chloroquine | tablet, 150 mg (as phosphate or sulfate) |
| | syrup, 50 mg (as phosphate or sulfate)/5 ml |
| doxycycline | capsule or tablet, 100 mg (hydrochloride) |
| mefloquine | tablet, 250 mg (as hydrochloride) |
| proguanil[b] | tablet, 100 mg (hydrochloride) |
| 6.5.4 *Antipneumocystosis and antitoxoplasmosis drugs* | |
| pentamidine (2) | tablet, 200 mg, 300 mg |
| pyrimethamine | tablet, 25 mg |
| sulfamethoxazole + trimethoprim | injection, 80 mg + 16 mg/ml in 5-ml ampoule, 80 mg + 16 mg/ml in 10-ml ampoule |
| 6.5.5 *Antitrypanosomal drugs* | |
| *(a) African trypanosomiasis* | |
| melarsoprol (2) | injection, 3.6% solution |
| pentamidine (2) | powder for injection, 200 mg, 300 mg (isetionate) in vial |
| suramin sodium | powder for injection, 1 g in vial |
| *Complementary drug* | |
| eflornithine (C) | injection, 200 mg (hydrochloride)/ml in 100-ml bottles |
| *(b) American trypanosomiasis* | |
| benznidazole (7) | tablet, 100 mg |
| nifurtimox (2, 8) | tablet, 30 mg, 120 mg, 250 mg |
| **6.6 *Insect repellents*** | |
| diethyltoluamide | topical solution, 50%, 75% |

[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] For use only in combination with chloroquine.

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **7. Antimigraine drugs** | |
| **7.1 *For treatment of acute attack*** | |
| acetylsalicylic acid | tablet, 300–500 mg |
| ergotamine (7) | tablet, 1 mg (tartrate) |
| paracetamol | tablet, 300–500 mg |
| **7.2 *For prophylaxis*** | |
| □ propranolol | tablet, 20 mg, 40 mg (hydrochloride) |
| **8. Antineoplastic and immunosuppressive drugs and drugs used in palliative care** | |
| **8.1 *Immunosuppressive drugs***[b] | |
| □ azathioprine (2) | tablet, 50 mg |
| | powder for injection, 100 mg (as sodium salt) in vial |
| □ ciclosporin (2)[c] | capsule, 25 mg |
| | concentrate for injection, 50 mg/ml in 1-ml ampoule |
| **8.2 *Cytotoxic drugs***[b] | |
| asparaginase (2) | powder for injection, 10 000 IU in vial |
| bleomycin (2) | powder for injection, 15 mg (as sulfate) in vial |
| calcium folinate (2) | tablet, 15 mg |
| | injection, 3 mg/ml in 10-ml ampoule |
| chlorambucil (2) | tablet, 2 mg |
| chlormethine (2) | powder for injection, 10 mg (hydrochloride) in vial |
| cisplatin (2) | powder for injection, 10 mg, 50 mg in vial |
| cyclophosphamide (2) | tablet, 25 mg |
| | powder for injection, 500 mg 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".

[b] For use only where adequate resources and specialist care are available.

[c] For organ transplantation.

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **8. Antineoplastic and immunosuppressive drugs and drugs used in palliative care** (*continued*) | |
| **8.2 *Cytotoxic drugs***[b] (*continued*) | |
| cytarabine (2) | powder for injection, 100 mg in vial |
| dacarbazine (2) | powder for injection, 100 mg in vial |
| dactinomycin (2) | powder for injection, 500 µg in vial |
| daunorubicin (2) | powder for injection, 50 mg (as hydrochloride) |
| □ doxorubicin (2) | powder for injection, 10 mg, 50 mg (hydrochloride) in vial |
| etoposide (2) | capsule, 100 mg |
| | injection, 20 mg/ml in 5-ml ampoule |
| fluorouracil (2) | injection, 50 mg/ml in 5-ml ampoule |
| levamisole (2) | tablet, 50 mg (as hydrochloride) |
| mercaptopurine (2) | tablet, 50 mg |
| methotrexate (2) | tablet, 2.5 mg (as sodium salt) |
| | powder for injection, 50 mg (as sodium salt) in vial |
| procarbazine | capsule, 50 mg (as hydrochloride) |
| vinblastine (2) | powder for injection, 10 mg (sulfate) in vial |
| vincristine (2) | powder for injection, 1 mg, 5 mg (sulfate) in vial |
| **8.3 *Hormones and antihormones*** | |
| □ prednisolone | tablet, 5 mg |
| | powder for injection, 20 mg, 25 mg (as sodium phosphate or sodium succinate) in vial |
| tamoxifen | tablet, 10 mg, 20 mg (as 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".

[b] For use only where adequate resources and specialist care are available.

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **8. Antineoplastic and immunosuppressive drugs and drugs used in palliative care** (*continued*) | |
| **8.4 *Drugs used in palliative care*** | |
| The Committee recommended that all the drugs mentioned in the WHO publication *Cancer pain relief: with a guide to opioid availability*, second ed. (*51*) be considered essential. The drugs are included in the relevant sections of the model list, according to their therapeutic use, e.g. analgesics. | |
| **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 |
| **10. Drugs affecting the blood** | |
| **10.1 *Antianaemia drugs*** | |
| ferrous salt | tablet, equivalent to 60 mg iron |
| | oral solution, equivalent to 25 mg iron (as sulfate)/ml |
| ferrous salt + folic acid[b] | tablet, equivalent to 60 mg iron + 400 µg folic acid |
| folic acid (2) | tablet, 1 mg, 5 mg |
| | injection, 1 mg (as sodium salt) in 1-ml ampoule |
| hydroxocobalamin (2) | injection, 1 mg in 1-ml ampoule |
| *Complementary drug* | |
| □ iron dextran (B) (5) | injection, equivalent to 50 mg iron/ml in 2-ml ampoule |
| **10.2 *Drugs affecting coagulation*** | |
| desmopressin (8) | injection, 4 µg (acetate)/ml in 1-ml ampoule |
| | nasal spray, 10 µg (acetate)/metered dose |

[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] Nutritional supplement for use during pregnancy.

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **10. Drugs affecting the blood** (*continued*) | |
| **10.2 *Drugs affecting coagulation*** (*continued*) | |
| heparin sodium | injection, 1000 IU/ml, 5000 IU/ml, 20 000 IU/ml in 1-ml ampoule |
| phytomenadione | injection, 10 mg/ml in 5-ml ampoule |
| | tablet, 10 mg |
| protamine sulfate | injection, 10 mg/ml in 5-ml ampoule |
| □ warfarin (2, 6) | tablet, 1 mg, 2 mg, 5 mg (sodium salt) |
| **11. Blood products and plasma substitutes** | |
| **11.1 *Plasma substitutes*** | |
| □ dextran 70 | injectable solution, 6% |
| □ polygeline | injectable solution, 3.5% |
| **11.2 *Plasma fractions for specific uses***[b] | |
| *Complementary drugs* | |
| □ factor VIII concentrate (C) (2, 8) | dried |
| □ factor IX complex (coagulation factors II, VII, IX, X) concentrate (C) (2, 8) | dried |
| **12. Cardiovascular drugs** | |
| **12.1 *Antianginal drugs*** | |
| □ atenolol | tablet, 50 mg, 100 mg |
| glyceryl trinitrate | tablet (sublingual), 500 µg |
| □ isosorbide dinitrate | tablet (sublingual), 5 mg |
| □ verapamil (10) | tablet, 40 mg, 80 mg (hydrochloride) |
| **12.2 *Antiarrhythmic drugs*** | |
| □ atenolol | tablet, 50 mg, 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".

[b] All plasma fractions should comply with the Requirements for the Collection, Processing and Quality Control of Blood, Blood Components, and Plasma Derivatives (Revised 1992). *WHO Expert Committee on Biological Standardization. Forty-third report* (WHO Technical Report Series, No. 840, 1994, Annex 2).

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **12. Cardiovascular drugs** (*continued*) | |
| **12.2 *Antiarrhythmic drugs*** (*continued*) | |
| digoxin (4, 11) | tablet, 62.5 µg, 250 µg |
| | oral solution, 50 µg/ml |
| | injection, 250 µg/ml in 2-ml ampoule |
| lidocaine | injection, 20 mg (hydrochloride)/ml in 5-ml ampoule |
| verapamil (8, 10) | tablet, 40 mg, 80 mg (hydrochloride) |
| | injection, 2.5 mg (hydrochloride)/ml in 2-ml ampoule |
| *Complementary drugs* | |
| epinephrine (adrenaline) (C) | injection, 1 mg (as hydrochloride)/ml in ampoule |
| isoprenaline (C) | injection, 20 µg (hydrochloride)/ml in ampoule |
| □ procainamide (B) | injection, 100 mg (hydrochloride)/ml in 10-ml ampoule |
| □ quinidine (A) (7) | tablet, 200 mg (sulfate) |
| **12.3 *Antihypertensive drugs*** | |
| □ atenolol | tablet, 50 mg, 100 mg |
| □ captopril | scored tablet, 25 mg |
| □ hydralazine | tablet, 25 mg, 50 mg (hydrochloride) |
| | powder for injection, 20 mg (hydrochloride) in ampoule |
| □ hydrochlorothiazide | scored tablet, 25 mg |
| methyldopa (7) | tablet, 250 mg |
| □ nifedipine (10) | sustained-release formulations |
| | tablet, 10 mg |
| □ reserpine | tablet, 100 µg, 250 µg |
| | injection, 1 mg in 1-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".

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **12. Cardiovascular drugs** (*continued*) | |
| **12.3 *Antihypertensive drugs*** (*continued*) | |
| *Complementary drugs* | |
| □ prazosin (B) | tablet, 500 µg, 1 mg |
| □ sodium nitroprusside (C) (2, 8) | powder for infusion, 50 mg in ampoule |
| **12.4 *Drugs used in heart failure*** | |
| □ captopril | scored tablet, 25 mg |
| digoxin (4, 11) | tablet, 62.5 µg, 250 µg |
| | oral solution, 50 µg/ml |
| | injection, 250 µg/ml in 2-ml ampoule |
| dopamine | injection, 40 mg (hydrochloride)/ml in 5-ml vial |
| □ hydrochlorothiazide | tablet, 25 mg, 50 mg |
| **12.5 *Antithrombotic drugs*** | |
| acetylsalicylic acid | tablet, 100 mg |
| *Complementary drug* | |
| streptokinase (C) | powder for injection, 100 000 IU, 750 000 IU in vial |

**12.6 *Lipid-lowering agents***

The Committee recognizes the value of lipid-lowering drugs in treating patients with hyperlipidaemia. β-Hydroxy-β-methylglutaryl-coenzyme A (HMG CoA) reductase inhibitors, often referred to as "statins", are a family of potent and effective lipid-lowering drugs with a good tolerability profile. Several of these drugs have been shown to reduce the incidence of fatal and non-fatal myocardial infarction, stroke and mortality (all causes), as well as the need for coronary by-pass surgery. All remain very costly but may be cost-effective for secondary prevention of cardiovascular disease as well as for primary prevention in some very high-risk patients. Since no single drug has been shown to be significantly more effective or less expensive than others in the group, none is included in the model list; the choice of drug for use in patients at highest risk should be decided at the national level.

[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".

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **13. Dermatological drugs (topical)** | |
| **13.1 *Antifungal drugs*** | |
| benzoic acid + salicylic acid | ointment or cream, 6% + 3% |
| □ miconazole | ointment or cream, 2% (nitrate) |
| sodium thiosulfate | solution, 15% |
| *Complementary drug* | |
| selenium sulfide (C) | detergent-based suspension, 2% |
| **13.2 *Anti-infective drugs*** | |
| □ methylrosanilinium chloride (gentian violet) | aqueous solution, 0.5% |
| | tincture, 0.5% |
| neomycin + □ bacitracin (7) | ointment, 5 mg neomycin sulfate + 500 IU bacitracin zinc/g |
| potassium permanganate | aqueous solution, 1 : 10 000 |
| silver sulfadiazine | cream, 1%, in 500-g container |
| **13.3 *Anti-inflammatory 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 diacetate | solution, 13% for dilution |
| **13.5 *Drugs affecting skin differentiation and proliferation*** | |
| benzoyl peroxide | lotion or cream, 5% |
| coal tar | solution, 5% |
| dithranol | ointment, 0.1–2% |
| fluorouracil | ointment, 5% |
| □ podophyllum resin (7) | solution, 10–25% |
| salicylic acid | solution, 5% |
| urea | ointment or cream, 10% |

[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".

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **13. Dermatological drugs (topical)** (*continued*) | |
| **13.6 *Scabicides and pediculicides*** | |
| □ benzyl benzoate | lotion, 25% |
| permethrin | cream, 5% |
| | lotion, 1% |
| **13.7 *Ultraviolet-blocking agents*** | |
| *Complementary drug* | |
| topical sun protection agent with activity against ultraviolet A and ultraviolet B (C) | cream, lotion or gel |
| **14. Diagnostic agents** | |
| **14.1 *Ophthalmic drugs*** | |
| fluorescein | eye drops, 1% (sodium salt) |
| □ tropicamide | eye drops, 0.5% |
| **14.2 *Radiocontrast media*** | |
| □ amidotrizoate | injection, 140–420 mg iodine (as sodium or meglumine salt)/ml in 20-ml ampoule |
| barium sulfate | aqueous suspension |
| □ iohexol | injection, 140–350 mg iodine/ml in 5-ml, 10-ml or 20-ml ampoule |
| □ iopanoic acid | tablet, 500 mg |
| □ propyliodone | oily suspension, 500–600 mg/ml in 20-ml ampoule[b] |
| *Complementary drug* | |
| □ meglumine iotroxate (C) | solution, 5–8 g iodine in 100–250 ml |
| **15. Disinfectants and antiseptics** | |
| **15.1 *Antiseptics*** | |
| □ chlorhexidine | solution, 5% (digluconate) for dilution |
| □ ethanol | solution, 70% (denatured) |
| □ polyvidone iodine | solution, 10% |

[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] For administration only into the bronchial tree.

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **15. Disinfectants and antiseptics** (*continued*) | |
| **15.2** ***Disinfectants*** | |
| □ chlorine base compound | powder (0.1% available chlorine) for solution |
| □ chloroxylenol | solution, 4.8% |
| glutaral | solution, 2% |
| **16. Diuretics** | |
| □ amiloride (4, 7, 8) | tablet, 5 mg (hydrochloride) |
| □ furosemide | tablet, 40 mg |
| | injection, 10 mg/ml in 2-ml ampoule |
| □ hydrochlorothiazide | tablet, 25 mg, 50 mg |
| spironolactone (8) | tablet, 25 mg |
| *Complementary drug* | |
| □ mannitol (C) | injectable solution, 10%, 20% |
| **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 |
| **17.2** ***Antiemetic drugs*** | |
| metoclopramide | tablet, 10 mg (hydrochloride) |
| | injection, 5 mg (hydrochloride)/ml in 2-ml ampoule |
| □ promethazine | tablet, 10 mg, 25 mg (hydrochloride) |
| | elixir or syrup, 5 mg (hydrochloride)/5 ml |
| | injection, 25 mg (hydrochloride)/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".

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **17. Gastrointestinal drugs** (*continued*) | |
| **17.3 *Antihaemorrhoidal drugs*** | |
| □ local anaesthetic, astringent and anti-inflammatory drug | ointment or suppository |
| **17.4 *Anti-inflammatory drugs*** | |
| □ hydrocortisone[b] | suppository, 25 mg (acetate) |
| | retention enema |
| □ sulfasalazine (2) | tablet, 500 mg |
| | suppository, 500 mg |
| | retention enema |
| **17.5 *Antispasmodic drugs*** | |
| □ atropine | tablet, 1 mg (sulfate) |
| | injection, 1 mg (sulfate) in 1-ml ampoule |
| **17.6 *Laxatives*** | |
| □ senna | tablet, 7.5 mg (sennosides) (or traditional dosage forms) |
| **17.7 *Drugs used in diarrhoea*** | |
| 17.7.1 *Oral hydration* | |
| oral rehydration salts (for glucose-electrolyte solution) | powder, 27.9 g/l |
| *Components* | *g/l* |
| sodium chloride | 3.5 |
| trisodium citrate dihydrate[c] | 2.9 |
| potassium chloride | 1.5 |
| glucose | 20.0 |
| 17.7.2 *Antidiarrhoeal (symptomatic) drugs* | |
| □ codeine (1a) | tablet, 30 mg (phosphate) |

[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] The square symbol applies only to hydrocortisone, retention enema.

[c] Trisodium citrate dihydrate may be replaced by sodium hydrogen carbonate (sodium bicarbonate) 2.5 g/l. However, as the stability of this latter formulation is very poor under tropical conditions, it is only recommended when manufactured for immediate use.

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **18. Hormones, other endocrine drugs and contraceptives** | |
| **18.1 *Adrenal hormones and synthetic substitutes*** | |
| □ dexamethasone | tablet, 500 µg, 4 mg |
| | injection, 4 mg dexamethasone phosphate (as disodium salt) in 1-ml ampoule |
| hydrocortisone | powder for injection, 100 mg (as sodium succinate) in vial |
| □ prednisolone | tablet, 1 mg, 5 mg |
| *Complementary drug* | |
| fludrocortisone (C) | tablet, 100 µg (acetate) |
| **18.2 *Androgens*** | |
| *Complementary drug* | |
| testosterone (C) (2) | injection, 200 mg (enantate) in 1-ml ampoule |
| **18.3 *Contraceptives*** | |
| 18.3.1 *Hormonal contraceptives* | |
| □ ethinylestradiol + □ levonorgestrel | tablet, 30 µg + 150 µg |
| | tablet, 50 µg + 250 µg (pack of four) |
| □ ethinylestradiol + □ norethisterone | tablet, 35 µg + 1.0 mg |
| levonorgestrel | tablet, 0.75 mg (pack of two) |
| *Complementary drugs* | |
| levonorgestrel (B) | tablet, 30 µg |
| medroxyprogesterone acetate (B) (7, 8) | depot injection, 150 mg in 1-ml vial |
| norethisterone enantate (B) (7, 8) | oily solution, 200 mg in 1-ml ampoule |
| 18.3.2 *Intrauterine devices* | |
| copper-containing device | |
| 18.3.3 *Barrier methods* | |
| condoms with or without spermicide (nonoxinol) | |

[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".

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **18. Hormones, other endocrine drugs and contraceptives** (*continued*) | |
| **18.3 *Contraceptives*** (*continued*) | |
| 18.3.3 *Barrier methods* (*continued*) | |
| diaphragms with spermicide (nonoxinol) | |
| **18.4 *Estrogens*** | |
| □ ethinylestradiol | tablet, 10 µg, 50 µg |
| **18.5 *Insulins and other antidiabetic agents*** | |
| □ glibenclamide | tablet, 2.5 mg, 5 mg |
| insulin injection (soluble) | injection, 40 IU/ml in 10-ml vial, 100 IU/ml in 10-ml vial |
| intermediate-acting insulin | injection, 40 IU/ml in 10-ml vial, 100 IU/ml in 10-ml vial (as compound insulin zinc suspension or isophane insulin) |
| metformin | tablet, 500 mg (hydrochloride) |
| **18.6 *Ovulation inducers*** | |
| □ clomifene (2, 8) | tablet, 50 mg (citrate) |
| **18.7 *Progestogens*** | |
| norethisterone | tablet, 5 mg |
| *Complementary drug* | |
| medroxyprogesterone acetate (B) | tablet, 5 mg |
| **18.8 *Thyroid hormones and antithyroid drugs*** | |
| levothyroxine | tablet, 50 µg, 100 µg (sodium salt) |
| potassium iodide | tablet, 60 mg |
| □ propylthiouracil | tablet, 50 mg |
| **19. Immunologicals** | |
| **19.1 *Diagnostic agents*** | |
| tuberculin,[b] purified protein derivative (PPD) | injection |

[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] All tuberculins should comply with the Requirements for Tuberculins (Revised 1985). *WHO Expert Committee on Biological Standardization. Thirty-sixth report* (WHO Technical Report Series, No. 745, 1987, Annex 1).

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **19. Immunologicals** (*continued*) | |
| **19.2 *Sera and immunoglobulins***[b] | |
| anti-D immunoglobulin (human) | injection, 250 µg in single-dose vial |
| □ antitetanus immunoglobulin (human) | injection, 500 IU in vial |
| antivenom sera | injection |
| diphtheria antitoxin | injection, 10 000 IU, 20 000 IU in vial |
| immunoglobulin, human normal (2) | injection (intramuscular) |
| immunoglobulin, human normal (2, 8) | injection (intravenous) |
| □ rabies immunoglobulin | injection, 150 IU/ml in vial |
| **19.3 *Vaccines***[c] | |
| 19.3.1 *For universal immunization* | |
| BCG vaccine | |
| diphtheria vaccine | |
| hepatitis B vaccine | |

[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] All plasma fractions should comply with the Requirements for the Collection, Processing and Quality Control of Blood, Blood Components and Plasma Derivatives (Revised 1992). *WHO Expert Committee on Biological Standardization. Forty-third report* (WHO Technical Report Series, No. 840, 1994, Annex 2).

[c] All vaccines should comply with the following Requirements for Biological Substances, as published in the reports of the WHO Expert Committee on Biological Standardization. Dried BCG vaccine (Revised 1985) (WHO Technical Report Series, No. 745, 1987) and Amendment 1987 (WHO Technical Report Series, No. 771, 1988); Diphtheria, Tetanus, Pertussis and Combined Vaccines (Revised 1989) (WHO Technical Report Series, No. 800, 1990); Hepatitis B Vaccine Prepared from Plasma (Revised 1994) (WHO Technical Report Series, No. 858, 1995); Influenza Vaccine (Inactivated) (Revised 1990) (WHO Technical Report Series, No. 814, 1991); Measles, Mumps and Rubella Vaccines and Combined Vaccine (Live) (Revised 1992) (WHO Technical Report Series, No. 840, 1994) and Note (WHO Technical Report Series, No. 848, 1994); Meningococcal Polysaccharide Vaccine (WHO Technical Report Series, No. 594, 1976) and Addendum 1980, incorporating Addendum 1976 and Addendum 1977 (WHO Technical Report Series, No. 658, 1981); Poliomyelitis Vaccine (Oral) (Revised 1989) (WHO Technical Report Series, No. 800, 1990); Poliomyelitis Vaccine (Inactivated) (Revised 1981) (WHO Technical Report Series, No. 673, 1982) and Addendum 1985 (WHO Technical Report Series, No. 745, 1987); Rabies Vaccine for Human Use (Revised 1980) (WHO Technical Report Series, No. 658, 1981) and Amendment 1992 (WHO Technical Report Series, No. 840, 1994); Rabies Vaccine (Inactivated) for Human Use Produced in Continuous Cell Lines (Revised 1986) (WHO Technical Report Series, No. 760, 1987) and Amendment 1992 (WHO Technical Report Series, No. 840, 1994); Typhoid Vaccine (Live, Attenuated, Ty 21a, Oral) (WHO Technical Report Series, No. 700, 1984); Vi Polysaccharide Typhoid Vaccine (WHO Technical Report Series, No. 840, 1994); Yellow Fever Vaccine (Revised 1995) (WHO Technical Report Series, No. 872, 1998).

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **19. Immunologicals** (*continued*) | |
| **19.3 *Vaccines***[b] (*continued*) | |
| 19.3.1 *For universal immunization* (*continued*) | |
| measles vaccine | |
| pertussis vaccine | |
| poliomyelitis vaccine | |
| tetanus vaccine | |
| 19.3.2 *For specific groups of individuals* | |
| influenza vaccine | |
| meningococcal meningitis vaccine | |
| mumps vaccine | |
| rabies vaccine (inactivated) (prepared in cell culture) | |
| rubella vaccine | |
| typhoid vaccine | |
| yellow fever vaccine | |

[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] All vaccines should comply with the following Requirements for Biological Substances, as published in the reports of the WHO Expert Committee on Biological Standardization. Dried BCG vaccine (Revised 1985) (WHO Technical Report Series, No. 745, 1987) and Amendment 1987 (WHO Technical Report Series, No. 771, 1988); Diphtheria, Tetanus, Pertussis and Combined Vaccines (Revised 1989) (WHO Technical Report Series, No. 800, 1990); Hepatitis B Vaccine Prepared from Plasma (Revised 1994) (WHO Technical Report Series, No. 858, 1995); Influenza Vaccine (Inactivated) (Revised 1990) (WHO Technical Report Series, No. 814, 1991); Measles, Mumps and Rubella Vaccines and Combined Vaccine (Live) (Revised 1992) (WHO Technical Report Series, No. 840, 1994) and Note (WHO Technical Report Series, No. 848, 1994); Meningococcal Polysaccharide Vaccine (WHO Technical Report Series, No. 594, 1976) and Addendum 1980, incorporating Addendum 1976 and Addendum 1977 (WHO Technical Report Series, No. 658, 1981); Poliomyelitis Vaccine (Oral) (Revised 1989) (WHO Technical Report Series, No. 800, 1990); Poliomyelitis Vaccine (Inactivated) (Revised 1981) (WHO Technical Report Series, No. 673, 1982) and Addendum 1985 (WHO Technical Report Series, No. 745, 1987); Rabies Vaccine for Human Use (Revised 1980) (WHO Technical Report Series, No. 658, 1981) and Amendment 1992 (WHO Technical Report Series, No. 840, 1994); Rabies Vaccine (Inactivated) for Human Use Produced in Continuous Cell Lines (Revised 1986) (WHO Technical Report Series, No. 760, 1987) and Amendment 1992 (WHO Technical Report Series, No. 840, 1994); Typhoid Vaccine (Live, Attenuated, Ty 21a, Oral) (WHO Technical Report Series, No. 700, 1984); Vi Polysaccharide Typhoid Vaccine (WHO Technical Report Series, No. 840, 1994); Yellow Fever Vaccine (Revised 1995) (WHO Technical Report Series, No. 872, 1998).

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **20. Muscle relaxants (peripherally acting) and cholinesterase inhibitors** | |
| alcuronium (2) | injection, 5 mg (chloride)/ml in 2-ml ampoule |
| neostigmine | tablet, 15 mg (bromide) |
| | injection, 500 µg, 2.5 mg (metilsulfate) in 1-ml ampoule |
| pyridostigmine (2, 8) | tablet, 60 mg (bromide) |
| | injection, 1 mg in 1-ml ampoule |
| suxamethonium (2) | injection, 50 mg (chloride)/ml in 2-ml ampoule |
| | powder for injection (chloride), in vial |
| *Complementary drug* | |
| vecuronium (C) | powder for injection, 10 mg (bromide) in vial |
| **21. Ophthalmological preparations** | |
| **21.1 *Anti-infective agents*** | |
| gentamicin | solution (eye drops), 0.3% (as sulfate) |
| idoxuridine | solution (eye drops), 0.1% |
| | eye ointment, 0.2% |
| silver nitrate | solution (eye drops), 1% |
| tetracycline | eye ointment, 1% (hydrochloride) |
| **21.2 *Anti-inflammatory agents*** | |
| prednisolone | solution (eye drops), 0.5% (sodium phosphate) |
| **21.3 *Local anaesthetics*** | |
| tetracaine | solution (eye drops), 0.5% (hydrochloride) |
| **21.4 *Miotics and antiglaucoma drugs*** | |
| acetazolamide | tablet, 250 mg |
| pilocarpine | solution (eye drops), 2%, 4% (hydrochloride or nitrate) |

[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".

Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **21. Ophthalmological preparations** (*continued*) | |
| **21.4 *Miotics and antiglaucoma drugs*** (*continued*) | |
| □ timolol | solution (eye drops), 0.25%, 0.5% (as maleate) |
| **21.5 *Mydriatics*** | |
| atropine | solution (eye drops), 0.1%, 0.5%, 1% (sulfate) |
| *Complementary drug* | |
| epinephrine (adrenaline) (A) | solution (eye drops), 2% (as hydrochloride) |
| **22. Oxytocics and antioxytocics** | |
| **22.1 *Oxytocics*** | |
| □ ergometrine | tablet, 200 µg (hydrogen maleate) |
| | injection, 200 µg (hydrogen maleate) in 1-ml ampoule |
| oxytocin | injection, 10 IU in 1-ml ampoule |
| **22.2 *Antioxytocics*** | |
| □ salbutamol (2) | tablet, 4 mg (as sulfate) |
| | injection, 50 µg (as sulfate)/ml in 5-ml ampoule |
| **23. Peritoneal dialysis solution** | |
| intraperitoneal dialysis solution (of appropriate composition) | parenteral solution |
| **24. Psychotherapeutic drugs** | |
| **24.1 *Drugs used in psychotic disorders*** | |
| □ chlorpromazine | tablet, 100 mg (hydrochloride) |
| | syrup, 25 mg (hydrochloride)/5 ml |
| | injection, 25 mg (hydrochloride)/ml in 2-ml ampoule |
| □ fluphenazine (5) | injection, 25 mg (decanoate or enantate) in 1-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".

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **24. Psychotherapeutic drugs** (*continued*) | |
| **24.1 *Drugs used in psychotic disorders*** (*continued*) | |
| □ haloperidol | tablet, 2 mg, 5 mg |
| | injection, 5 mg in 1-ml ampoule |
| **24.2 *Drugs used in mood disorders*** | |
| 24.2.1 *Drugs used in depressive disorders* | |
| □ amitriptyline | tablet, 25 mg (hydrochloride) |
| 24.2.2 *Drugs used in bipolar disorders* | |
| carbamazepine (10, 11) | scored tablet, 100 mg, 200 mg |
| lithium carbonate (2, 4) | capsule or tablet, 300 mg |
| valproic acid (7, 11) | enteric coated tablet, 200 mg, 500 mg (sodium salt) |
| **24.3 *Drugs used in generalized anxiety and sleep disorders*** | |
| □ diazepam (1b) | scored tablet, 2 mg, 5 mg |
| **24.4 *Drugs used in obsessive–compulsive disorders and panic attacks*** | |
| clomipramine | capsules, 10 mg, 25 mg (hydrochloride) |
| **25. Drugs acting on the respiratory tract** | |
| **25.1 *Antiasthmatic drugs*** | |
| □ aminophylline (2) | injection, 25 mg/ml in 10-ml ampoule |
| □ beclometasone | inhalation (aerosol), 50 µg, 250 µg (dipropionate) per dose |
| □ epinephrine (adrenaline) | injection, 1 mg (as hydrochloride or hydrogen tartrate) in 1-ml ampoule |
| ipratropium bromide | inhalation (aerosol), 20 µg/metered dose |
| □ salbutamol | tablet, 2 mg, 4 mg (as sulfate) |
| | inhalation (aerosol), 100 µg (as sulfate) per dose |
| | syrup, 2 mg (as sulfate)/5 ml |
| | injection, 50 µg (as sulfate)/ml in 5-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".

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **25. Drugs acting on the respiratory tract** (*continued*) | |
| **25.1 *Antiasthmatic drugs*** (*continued*) | |
| □ salbutamol | respirator solution for use in nebulizers, 5 mg (as sulfate)/ml |
| theophylline (10, 11) | tablet, 100 mg, 200 mg, 300 mg |
| *Complementary drug* | |
| □ cromoglicic acid (B) | inhalation (aerosol), 20 mg (sodium salt) per dose |
| **25.2 *Antitussive*** | |
| □ dextromethorphan | oral solution, 3.5 mg (bromide)/5 ml |
| **26. Solutions correcting water, electrolyte and acid–base disturbances** | |
| **26.1 *Oral*** | |
| oral rehydration salts (for glucose–electrolyte solution) | for composition see section 17.7.1 (p. 36) |
| potassium chloride | powder for solution |
| **26.2 *Parenteral*** | |
| glucose | injectable solution, 5%, 10% isotonic, 50% hypertonic |
| glucose with sodium chloride | injectable solution, 4% glucose, 0.18% sodium chloride (equivalent to $Na^+$ 30 mmol/l, $Cl^-$ 30 mmol/l) |
| potassium chloride (2) | 11.2% solution in 20-ml ampoule (equivalent to $K^+$ 1.5 mmol/ml, $Cl^-$ 1.5 mmol/ml) |
| sodium chloride | injectable solution, 0.9% isotonic (equivalent to $Na^+$ 154 mmol/l, $Cl^-$ 154 mmol/l) |
| sodium hydrogen carbonate | injectable solution, 1.4% isotonic (equivalent to $Na^+$ 167 mmol/l, $HCO_3^-$ 167 mmol/l), 8.4% solution in 10-ml ampoule (equivalent to $Na^+$ 1000 mmol/l, $HCO_3^-$ 1000 mmol/l) |
| □ compound solution of sodium lactate | injectable solution |

[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".

□ Example of a therapeutic group.

| *Drug* | *Route of administration, dosage forms and strengths*[a] |
|---|---|
| **26. Solutions correcting water, electrolyte and acid–base disturbances** (*continued*) | |
| **26.3 *Miscellaneous*** | |
| water for injection | 2-ml, 5-ml, 10-ml ampoules |
| **27. Vitamins and minerals** | |
| ascorbic acid | tablet, 50 mg |
| □ ergocalciferol | capsule or tablet, 1.25 mg (50 000 IU) |
| | oral solution, 250 µg/ml (10 000 IU/ml) |
| iodine (8) | iodized oil, 1 ml (480 mg iodine), 0.5 ml (240 mg iodine) in ampoule (oral or injectable), 0.57 ml (308 mg iodine) in dispenser bottle |
| | capsule, 200 mg |
| □ nicotinamide | tablet, 50 mg |
| pyridoxine | tablet, 25 mg (hydrochloride) |
| □ retinol | sugar-coated tablet, 10 000 IU (as palmitate) (5.5 mg) |
| | capsule, 200 000 IU (as palmitate) (110 mg) |
| | oral oily solution, 100 000 IU/ml in multidose dispenser (as palmitate) |
| | water-miscible injection, 100 000 IU (as palmitate) (55 mg) in 2-ml ampoule |
| riboflavin | tablet, 5 mg |
| □ sodium fluoride | in any appropriate formulation |
| thiamine | tablet, 50 mg (hydrochloride) |
| *Complementary drug* | |
| 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".

□ Example of a therapeutic group.

## 13. Considerations and changes made in revising the model list

Amendments to the individual entries in the list are detailed below.

### Section 3. Antiallergics and drugs used in anaphylaxis

For epinephrine, the Committee recommended the addition of the name adrenaline, on the basis of its worldwide usage.

### Section 4. Antidotes and other substances used in poisonings

#### 4.2 *Specific*

Acetylcysteine injection, 200 mg/ml in 10-ml ampoule, is added to this section for the treatment of paracetamol poisoning because it shows greater efficacy when given intravenously than DL-methionine given orally (*52*).

### Section 5. Anticonvulsants/antiepileptics

Magnesium sulfate is transferred to the main list, since eclampsia is not considered a rare disorder.

### Section 6. Anti-infective drugs

#### 6.2.4 *Antituberculosis drugs*

Rifampicin + isoniazid (tablet, 60 mg + 30 mg, 60 mg + 60 mg), rifampicin + isoniazid + pyrazinamide (tablet, 60 mg + 30 mg + 150 mg) and rifampicin + isoniazid + pyrazinamide + ethambutol (tablet, 150 mg + 75 mg + 400 mg + 275 mg) are added to facilitate treatment of tuberculosis in paediatric patients and to improve compliance among adult patients (*53*).

#### 6.3 *Antifungal drugs*

Fluconazole replaces ketoconazole as the prototype drug since it is more cost-effective and is associated with fewer adverse effects.

#### 6.4.2 *Antiviral drugs*

Nevirapine tablet, 200 mg and oral solution, 50 mg/5 ml, are added to this section for the prevention of mother-to-child transmission of HIV, based on the results of a study sponsored by WHO and the recommendations of the WHO/UNAIDS Technical Working Group (*54*). The Committee discussed the limited safety information available on this drug, particularly for this use, but considered that its demonstrated value in reducing mother-to-child transmission of HIV outweighed the risk.

### 6.5.3 *Antimalarial drugs*

Artesunate tablet, 50 mg, is added for the treatment of malaria resistant to older drugs. Since this drug has variable bioavailability, special attention to the quality of the product is required.

The Committee discussed the combination product artemether + lumefantrine and is awaiting additional information on operational use in adults before making a decision.

Doxycycline capsule or tablet, 100 mg (hydrochloride) is added for prophylaxis against malaria, as an alternative to mefloquine.

### 6.5.5 *Antitrypanosomal drugs*

The Committee was informed that eflornithine and suramin sodium are no longer being produced. These drugs continue to be essential for treating African trypanosomiasis, especially in view of the resistance developing to melarsoprol. The Committee urged that production of these drugs be resumed.

## Section 8. Antineoplastic and immunosuppressive drugs and drugs used in palliative care

### 8.1 *Immunosuppressive drugs*

A square symbol is added to ciclosporin to indicate that tacrolimus could serve as an alternative.

### 8.2 *Cytotoxic drugs*

The Committee acknowledged the review of cancer therapy and antineoplastic drugs conducted by the International Agency for Research on Cancer (IARC) and accepted its recommendation to add daunorubicin powder for injection, 50 mg (as hydrochloride) and chlorambucil tablet, 2 mg, to the list, for the reasons summarized in a WHO Consultation (*55*). Asparaginase, chlormethine, dacarbazine and levamisole are retained on the list, as the evidence in support of their deletion was unclear. The Committee hopes that WHO will continue its evidence-based reviews in this area and inform the Committee of the results.

## Section 11. Blood products and plasma substitutes

### 11.2 *Plasma fractions for specific uses*

Albumin is deleted from the list since the results of the review by the Cochrane Collaboration suggest the likelihood of previously unrecognized hazards and a lack of evidence of better efficacy of albumin compared with alternatives.

## Section 12. Cardiovascular drugs

### 12.3 *Antihypertensive drugs*

Prazosin tablet, 500μg and 1mg, replaces doxazosin in the complementary list as the representative of the α-adrenoreceptor antagonist class of drugs since it is now less expensive than doxazosin.

### 12.6 *Lipid-lowering agents*

The paragraph on lipid-lowering agents has been revised to focus only on drug issues. The Committee recommended that management of risk factors for atherosclerotic disease should be addressed in treatment guidelines.

## Section 13. Dermatological drugs (topical)

### 13.2 *Anti-infective agents*

The Committee reviewed the safety of methylrosanilinium chloride (gentian violet), but concluded that the overall benefits (including its very low cost) outweighed the risks and that it should be maintained on the list.

## Section 14. Diagnostic agents

### 14.2 *Radiocontrast media*

Iohexol injection, 140–350mg iodine/ml in 5-ml, 10-ml or 20-ml ampoule is added since it is safer than ionized contrast media. The Committee discussed whether propyliodone is essential and asked that a formal recommendation be made at its next meeting.

## Section 15. Disinfectants and antiseptics

The Committee discussed section 15 and requested that it be formally reviewed at its next meeting.

### 15.1 *Antiseptics*

Ethanol, 70% solution is added, owing to its widespread use. The Committee recommended that the solution be denatured to preclude its use as a beverage. The square symbol is to indicate that propanol may be used as an alternative.

## Section 17. Gastrointestinal drugs

### 17.1 *Antacids and other antiulcer drugs*

The Committee recognized that other $H_2$ blockers may be slightly safer than cimetidine but cimetidine continues to be listed as repre-

sentative of the $H_2$ blocker class of drugs. Detailed review of all drugs for treatment of peptic ulcer is requested for the future.

### 17.4 *Anti-inflammatory drugs*

Hydrocortisone, retention enema, is now recognized as representative of this class of drugs, which includes prednisolone, retention enema.

### 17.6 *Laxatives*

The Committee recommended that the antidiarrhoeal class of drugs be reviewed and its revision be considered at the next meeting.

### 17.7 *Drugs used in diarrhoea*

The Committee recommended that the antidiarrhoeal class of drugs be reviewed and its revision be considered at the next meeting.

## Section 18. Hormones, other endocrine drugs and contraceptives

### 18.3 *Contraceptives*

Levonorgestrel tablet, 0.75 mg (pack of two) is added for emergency contraception on the basis of the published comparative clinical trials. The Committee recognizes that this regimen is superior to ethinylestradiol + levonorgestrel tablet, 50 μg + 250 μg (pack of four), which is retained on the list for the time being. These drugs are included on the main list in recognition of their need.

## Section 19. Immunologicals

### 19.2 *Sera and immunoglobulins*

Antiscorpion sera are deleted because of a lack of efficacy of these products (*56*).

### 19.3 *Vaccines*

The Committee accepted the recommendation of the WHO Department of Vaccines and Biologicals to modify the list of essential vaccines to list the antigens but not the specific vaccine mixtures. The reason is that there are various combination products intended for different groups of people and that listing all of the recommended vaccines would unduly complicate the list. Specific therapeutic recommendations for vaccines containing single antigens or mixtures of antigens are found in the policy statements of the WHO Department of Vaccines and Biologicals (*57*).

### Section 22. Oxytocics and antioxytocics

The Committee urges a systematic review of haemostatic agents for the next meeting rather than considering single agents at this time. The Committee also urges that a systematic review of agents for the treatment of menorrhagia be carried out in the future.

### Section 24. Psychotherapeutic drugs

Suggestions to change the title of this section, explain the meaning of the square symbol, and add the selective serotonin re-uptake inhibitors to the list initiated a general discussion of the drugs in section 24 and the subclassifications in this section. The Committee decided that there was insufficient urgency to include the selective serotonin re-uptake inhibitors at this time and requested that this section be reviewed in total and that a recommendation for the essential drugs to treat mental illness be presented at the next meeting.

Data from the Cochrane Collaboration indicate that nicotine replacement therapy aids in smoking cessation, especially when provided as part of a comprehensive smoking cessation programme. The public health consequences of smoking have been demonstrated repeatedly. The specific usefulness of nicotine replacement therapy in a smoking cessation programme must be decided at the national or more local level. Because the cost-effectiveness of such therapy varies in different localities, no individual product was listed as essential at this time. Additional information on the cost-effectiveness of nicotine replacement therapy in a variety of countries and settings and in various smoking cessation programmes would be helpful in any future consideration of this subject.

### Section 25. Drugs acting on the respiratory tract

25.1 ***Antiasthmatic drugs***

For theophylline, a 300-mg tablet is added to improve compliance.

### Section 27. Vitamins and minerals

The Committee discussed micronutrient supplementation of oral rehydration fluid, and requested that a formal proposal of a specific formula be made available at a future meeting.

## 14. 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 for the same condition. |
| *Bioavailability* | The rate and extent of absorption of a drug from a dosage form as determined by its concentration/time curve in the systemic circulation or its excretion in urine. |
| *Compliance* | Faithful adherence by the patient to the prescriber's instructions. |
| *Dosage form* | The form of the completed pharmaceutical product, e.g. tablet, capsule, elixir, suppository. |
| *Drug* | Any substance in a pharmaceutical product that is used to modify or explore physiological systems or pathological states for the benefit of the recipient. |
| *Drug formulation* | The composition of a dosage form, including the characteristics of its raw materials and the operations required to process 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 purported effect as determined by scientific methods. |
| *Excipient* | Any component of a finished dosage form other than the claimed therapeutic ingredient or ingredients. |
| *Pharmaceutical product* | Synonymous with dosage form. |
| *Pharmacokinetics* | The study of the rate of drug action, particularly with respect to: |

— the variation of drug concentrations in tissues with time, and
— the absorption, distribution, metabolism and excretion of drugs and metabolites.

*Pharmacovigilance* — The surveillance of drugs for the detection, assessment and prevention of adverse effects.

# 15. Alphabetical list of essential drugs


| *Drug* | *Page* |
|---|---|
| **A** | |
| acetazolamide | 41 |
| acetylcysteine | 18 |
| acetylsalicylic acid | 16, 27, 32 |
| aciclovir | 24 |
| adrenaline (*see* epinephrine) | 17, 31, 42, 43 |
| albendazole | 19 |
| alcuronium | 41 |
| allopurinol | 16 |
| aluminium diacetate | 33 |
| aluminium hydroxide | 35 |
| amidotrizoate | 34 |
| amiloride | 35 |
| aminophylline | 43 |
| amitriptyline | 43 |
| amoxicillin | 20 |
| amoxicillin + clavulanic acid | 20 |
| amphotericin B | 23, 25 |
| ampicillin | 20 |
| anti-D immunoglobulin (human) | 39 |
| antihaemophilic fraction (*see* factor VIII concentrate) | 30 |
| antihaemorrhoidal preparation: local anaesthetic, astringent and anti-inflammatory drug | 36 |
| antitetanus immunoglobulin (human) | 39 |
| antivenom sera | 39 |
| artemether | 25 |
| artesunate | 25 |
| ascorbic acid | 45 |
| asparaginase | 27 |
| atenolol | 30, 31 |
| atropine | 15, 18, 36, 42 |
| azathioprine | 17, 27 |
| **B** | |
| bacitracin + neomycin | 33 |
| barium sulfate | 34 |
| BCG vaccine | 39 |
| beclometasone | 43 |
| benzathine benzylpenicillin | 20 |
| benznidazole | 26 |
| benzoic acid + salicylic acid | 33 |
| benzoyl peroxide | 33 |
| benzyl benzoate | 34 |
| benzylpenicillin | 20 |
| betamethasone | 33 |
| biperiden | 29 |
| bleomycin | 27 |
| bupivacaine | 15 |
| **C** | |
| calamine lotion | 33 |
| calcium folinate | 27 |
| calcium gluconate | 18, 45 |
| captopril | 31, 32 |
| carbamazepine | 18, 43 |
| carbidopa + levodopa | 29 |
| ceftazidime | 20 |
| ceftriaxone | 20 |
| charcoal, activated | 17 |
| chloral hydrate | 15 |
| chlorambucil | 27 |
| chloramphenicol | 21, 22 |
| chlorhexidine | 34 |
| chlorine base compound | 35 |
| chlormethine | 27 |
| chloroquine | 17, 25, 26 |
| chloroxylenol | 35 |
| chlorphenamine | 17 |
| chlorpromazine | 42 |
| ciclosporin | 27 |
| cilastatin + imipenem | 20 |
| cimetidine | 35 |
| ciprofloxacin | 21 |
| cisplatin | 27 |
| clavulanic acid + amoxicillin | 20 |
| clindamycin | 22 |
| clofazimine | 22 |
| clomifene | 38 |
| clomipramine | 43 |
| clonazepam | 19 |
| cloxacillin | 20 |
| coal tar | 33 |
| codeine | 16, 36 |
| colchicine | 16 |
| condoms | 37 |
| copper-containing intrauterine device | 37 |

| *Drug* | *Page* |
|---|---|
| **C** (*continued*) | |
| cromoglicic acid | 44 |
| cyclophosphamide | 17, 27 |
| cytarabine | 28 |
| **D** | |
| dacarbazine | 28 |
| dactinomycin | 28 |
| dapsone | 22 |
| daunorubicin | 28 |
| deferoxamine | 18 |
| desmopressin | 29 |
| dexamethasone | 17, 37 |
| dextran 70 | 30 |
| dextromethorphan | 44 |
| diaphragms | 38 |
| diazepam | 16, 18, 43 |
| diethylcarbamazine | 19 |
| diethyltoluamide | 26 |
| digoxin | 31, 32 |
| diloxanide | 24 |
| dimercaprol | 18 |
| diphtheria antitoxin | 39 |
| diphtheria vaccine | 39 |
| dithranol | 33 |
| dopamine | 32 |
| doxorubicin | 28 |
| doxycycline | 21, 25, 26 |
| **E** | |
| eflornithine | 26 |
| ephedrine | 15 |
| epinephrine (adrenaline) | 17, 31, 42, 43 |
| ergocalciferol | 45 |
| ergometrine | 42 |
| ergotamine | 27 |
| erythromycin | 21 |
| ethambutol | 22 |
| ethambutol + isoniazid | 22 |
| ethambutol + rifampicin + isoniazid + pyrazinamide | 23 |
| ethanol | 34 |
| ether, anaesthetic | 15 |
| ethinylestradiol | 38 |
| ethinylestradiol + levonorgestrel | 37 |
| ethinylestradiol + norethisterone | 37 |
| ethosuximide | 18 |
| etoposide | 28 |

| *Drug* | *Page* |
|---|---|
| **F** | |
| factor VIII concentrate | 30 |
| factor IX complex (coagulation factors II, VII, IX, X) concentrate | 30 |
| ferrous salt | 29 |
| ferrous salt + folic acid | 29 |
| fluconazole | 23 |
| flucytosine | 23 |
| fludrocortisone | 37 |
| fluorescein | 34 |
| fluorouracil | 28, 33 |
| fluphenazine | 42 |
| folic acid | 29 |
| folic acid + ferrous salt | 29 |
| furosemide | 35 |
| **G** | |
| gentamicin | 21, 41 |
| gentian violet (*see* methylrosanilinium chloride) | 33 |
| glibenclamide | 38 |
| glucose | 44 |
| glucose with sodium chloride | 44 |
| glutaral | 35 |
| glyceryl trinitrate | 30 |
| griseofulvin | 23 |
| **H** | |
| haloperidol | 43 |
| halothane | 15 |
| heparin sodium | 30 |
| hepatitis B vaccine | 39 |
| hydralazine | 31 |
| hydrochlorothiazide | 31, 32, 35 |
| hydrocortisone | 17, 33, 36, 37 |
| hydroxocobalamin | 29 |
| **I** | |
| ibuprofen | 16 |
| idoxuridine | 41 |
| imipenem + cilastatin | 20 |
| immunoglobulin, human normal | 39 |
| influenza vaccine | 40 |
| insulin injection, soluble | 38 |
| insulin, intermediate-acting | 38 |
| intraperitoneal dialysis solution | 42 |
| iodine | 45 |

| *Drug* | *Page* |
|---|---|
| **I** (*continued*) | |
| iohexol | 34 |
| iopanoic acid | 34 |
| iotroxate (*see* meglumine iotroxate) | 34 |
| ipecacuanha | 17 |
| ipratropium bromide | 43 |
| iron dextran | 29 |
| isoniazid | 22 |
| isoniazid + ethambutol | 22 |
| isoniazid + rifampicin | 23 |
| isoniazid + rifampicin + pyrazinamide | 23 |
| isoniazid + rifampicin + pyrazinamide + ethambutol | 23 |
| isoniazid + thioacetazone | 23 |
| isoprenaline | 31 |
| isosorbide dinitrate | 30 |
| ivermectin | 19 |
| **K** | |
| ketamine | 15 |
| **L** | |
| levamisole | 19, 28 |
| levodopa + carbidopa | 29 |
| levonorgestrel | 37 |
| levonorgestrel + ethinylestradiol | 37 |
| levothyroxine | 38 |
| lidocaine | 15, 31 |
| lithium carbonate | 43 |
| **M** | |
| magnesium hydroxide | 35 |
| magnesium sulfate | 18 |
| mannitol | 35 |
| measles vaccine | 40 |
| mebendazole | 19 |
| medroxyprogesterone acetate | 37, 38 |
| mefloquine | 25, 26 |
| meglumine amidotrizoate (*see* amidotrizoate) | 34 |
| meglumine antimoniate | 25 |
| meglumine iotroxate | 34 |
| melarsoprol | 26 |
| meningitis vaccine | 40 |

| *Drug* | *Page* |
|---|---|
| **M** (*continued*) | |
| mercaptopurine | 28 |
| metformin | 38 |
| DL-methionine | 18 |
| methotrexate | 17, 28 |
| methyldopa | 31 |
| methylene blue (*see* methylthioninium chloride) | 18 |
| methylrosanilinium chloride (gentian violet) | 33 |
| methylthioninium chloride (methylene blue) | 18 |
| metoclopramide | 35 |
| metronidazole | 21, 24 |
| miconazole | 33 |
| morphine | 16 |
| mumps vaccine | 40 |
| mustine (*see* chlormethine) | 27 |
| **N** | |
| nalidixic acid | 21 |
| naloxone | 18 |
| neomycin + bacitracin | 33 |
| neostigmine | 41 |
| nevirapine | 24 |
| niclosamide | 19 |
| nicotinamide | 45 |
| nifedipine | 31 |
| nifurtimox | 26 |
| nitrofurantoin | 21 |
| nitrous oxide | 15 |
| nonoxinol | 37, 38 |
| norethisterone | 38 |
| norethisterone enantate | 37 |
| norethisterone + ethinylestradiol | 37 |
| nystatin | 23 |
| **O** | |
| oral rehydration salts (for glucose–electrolyte solution) | 36, 44 |
| oxamniquine | 19 |
| oxygen | 15 |
| oxytocin | 42 |
| **P** | |
| paracetamol | 16, 27 |
| penicillamine | 17, 18 |

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|---|---|
| **P** (*continued*) | |
| pentamidine | 25, 26 |
| permethrin | 34 |
| pertussis vaccine | 40 |
| pethidine | 16 |
| phenobarbital | 18 |
| phenoxymethylpenicillin | 20 |
| phenytoin | 18, 19 |
| phytomenadione | 30 |
| pilocarpine | 41 |
| podophyllum resin | 33 |
| poliomyelitis vaccine | 40 |
| polygeline | 30 |
| polyvidone iodine | 34 |
| potassium chloride | 44 |
| potassium ferric hexacyanoferrate(II) · $2H_2O$ (Prussian blue) | 18 |
| potassium iodide | 23, 38 |
| potassium permanganate | 33 |
| praziquantel | 19 |
| prazosin | 32 |
| prednisolone | 17, 28, 37, 41 |
| primaquine | 25 |
| procainamide | 31 |
| procaine benzylpenicillin | 20 |
| procarbazine | 28 |
| proguanil | 26 |
| promethazine | 16, 35 |
| propranolol | 27 |
| propyliodone | 34 |
| propylthiouracil | 38 |
| protamine sulfate | 30 |
| Prussian blue (*see* potassium ferric hexacyanoferrate(II) · $2H_2O$) | 18 |
| pyrantel | 19 |
| pyrazinamide | 22 |
| pyrazinamide + rifampicin + isoniazid | 23 |
| pyrazinamide + rifampicin + isoniazid + ethambutol | 23 |
| pyridostigmine | 41 |
| pyridoxine | 45 |
| pyrimethamine | 26 |
| pyrimethamine + sulfadoxine | 25 |
| **Q** | |
| quinidine | 31 |
| quinine | 25 |
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| rabies immunoglobulin | 39 |
| rabies vaccine | 40 |
| reserpine | 31 |
| retinol | 45 |
| riboflavin | 45 |
| rifampicin | 22 |
| rifampicin + isoniazid | 23 |
| rifampicin + isoniazid + pyrazinamide | 23 |
| rifampicin + isoniazid + pyrazinamide + ethambutol | 23 |
| rubella vaccine | 40 |
| **S** | |
| salbutamol | 42, 43, 44 |
| salicylic acid | 33 |
| salicylic acid + benzoic acid | 33 |
| selenium sulfide | 33 |
| senna | 36 |
| silver nitrate | 41 |
| silver sulfadiazine | 33 |
| sodium amidotrizoate (*see* amidotrizoate) | 34 |
| sodium bicarbonate (*see* sodium hydrogen carbonate) | 44 |
| sodium calcium edetate | 18 |
| sodium chloride | 44 |
| sodium chloride with glucose | 44 |
| sodium fluoride | 45 |
| sodium hydrogen carbonate | 44 |
| sodium lactate, compound solution | 44 |
| sodium nitrite | 18 |
| sodium nitroprusside | 32 |
| sodium thiosulfate | 18, 33 |
| spectinomycin | 21 |
| spironolactone | 35 |
| streptokinase | 32 |
| streptomycin | 23 |
| sulfadiazine | 21 |
| sulfadoxine + pyrimethamine | 25 |
| sulfamethoxazole + trimethoprim | 22, 26 |
| sulfasalazine | 17, 36 |
| sunscreen for ultraviolet A and ultraviolet B | 34 |
| suramin sodium | 19, 26 |
| suxamethonium | 41 |

| *Drug* | *Page* |
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| **T** | |
| tamoxifen | 28 |
| testosterone | 37 |
| tetanus vaccine | 40 |
| tetracaine | 41 |
| tetracycline | 41 |
| theophylline | 44 |
| thiamine | 45 |
| thioacetazone + isoniazid | 23 |
| thiopental | 15 |
| timolol | 42 |
| triclabendazole | 19 |
| trimethoprim | 22 |
| trimethoprim + sulfamethoxazole | 22, 26 |
| tropicamide | 34 |
| tuberculin, purified protein derivative (PPD) | 38 |
| typhoid vaccine | 40 |
| **U** | |
| urea | 33 |
| **V** | |
| valproic acid | 19, 43 |
| vancomycin | 22 |
| vecuronium | 41 |
| verapamil | 30, 31 |
| vinblastine | 28 |
| vincristine | 28 |
| **W** | |
| warfarin | 30 |
| water for injection | 45 |
| **Y** | |
| yellow fever vaccine | 40 |
| **Z** | |
| zidovudine | 24 |


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