

WHO Model List of Essential Medicines for Children

**2nd List (updated)
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Status of this document

**This is a reprint of the text on the WHO Medicines
web site**

<http://www.who.int/medicines/publications/essentialmedicines/en/index.html>

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WHO Model List of Essential Medicines for Children

Explanatory Notes

This Model List is intended for use for children up to 12 years of age.

The **core list** presents a list of minimum medicine needs for a basic health care system, listing the most efficacious, safe and cost-effective medicines for priority conditions. Priority conditions are selected on the basis of current and estimated future public health relevance, and potential for safe and cost-effective treatment.

The **complementary list** presents essential medicines for priority diseases, for which specialized diagnostic or monitoring facilities, and/or specialist medical care, and/or specialist training are needed. In case of doubt medicines may also be listed as complementary on the basis of consistent higher costs or less attractive cost-effectiveness in a variety of settings.

The **square box symbol** (□) is primarily intended to indicate similar clinical performance within a pharmacological class. The listed medicine should be the example of the class for which there is the best evidence for effectiveness and safety. In some cases, this may be the first medicine that is licensed for marketing; in other instances, subsequently licensed compounds may be safer or more effective. Where there is no difference in terms of efficacy and safety data, the listed medicine should be the one that is generally available at the lowest price, based on international drug price information sources.

Therapeutic equivalence is only indicated on the basis of reviews of efficacy and safety and when consistent with WHO clinical guidelines. National lists should not use a similar symbol and should be specific in their final selection, which would depend on local availability and price.

The format and numbering of the 16th WHO Model List of Essential Medicines have been retained but, as indicated in the text, some sections have been deleted because they contain medicines that are not relevant for children.

a indicates that there is an age or weight restriction on use of the medicines; the details for each medicine are in Table 1.

In the List of Essential Medicines for Children, an additional symbol is used:

R indicates that the Subcommittee has endorsed the medicine as essential but has requested a review of the efficacy and safety to confirm this decision, or to expand use to additional age groups.

The presence of an entry on the Essential Medicines List carries no assurance as to pharmaceutical quality. It is the responsibility of the relevant national or regional drug regulatory authority to ensure that each product is of appropriate pharmaceutical quality (including stability) and that when relevant, different products are interchangeable.

For recommendations and advice concerning all aspects of the quality assurance of medicines see the WHO Medicines web site http://www.who.int/medicines/areas/quality_assurance/en/index.html

Medicines and dosage forms are listed in alphabetical order within each section and there is no implication of preference for one form over another. Standard treatment guidelines should be consulted for information on appropriate dosage forms.

The main terms used for dosage forms in the Essential Medicines List can be found in Annex 1. Definitions of many of these terms and pharmaceutical quality requirements applicable to the different categories are published in the current edition of *The International Pharmacopoeia* <http://www.who.int/medicines/publications/pharmacopoeia/en/index.html>.

1. ANAESTHETICS	
1.1 General anaesthetics and oxygen	
□ halothane R	Inhalation. R Review for alternative inhalational agents.
ketamine	Injection: 50 mg (as hydrochloride)/ml in 10-ml vial.
nitrous oxide	Inhalation.
oxygen	Inhalation (medicinal gas).
thiopental	Powder for injection: 0.5 g; 1 g (sodium salt) in ampoule.
1.2 Local anaesthetics	
□ bupivacaine	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 for spinal anaesthesia: 5% (hydrochloride) in 2-ml ampoule to be mixed with 7.5% glucose solution. Topical forms: 2% to 4% (hydrochloride).
lidocaine + epinephrine (adrenaline)	Dental cartridge: 2% (hydrochloride) + epinephrine 1:80 000. Injection: 1%; 2% (hydrochloride) + epinephrine 1:200 000 in vial.
1.3 Preoperative medication and sedation for short-term procedures R	
R Review of appropriate preoperative medication and sedation in children.	
atropine	Injection: 1 mg (sulfate) in 1-ml ampoule.
□ diazepam	Injection: 5 mg/ml in 2-ml ampoule. Tablet: 5 mg.
morphine	Injection: 10 mg (sulfate or hydrochloride) in 1-ml ampoule.
2. ANALGESICS, ANTIPYRETICS, NON-STEROIDAL ANTI-INFLAMMATORY MEDICINES (NSAIDs), MEDICINES USED TO TREAT GOUT AND DISEASE MODIFYING AGENTS IN RHEUMATOID DISORDERS (DMARDs)	
2.1 Non-opioids and non-steroidal anti-inflammatory medicines (NSAIDs)	
ibuprofen a R	Tablet: 200 mg; 400 mg. a >3 months. R Use in children, focusing on comparative analgesic and antipyretic efficacy and safety.
paracetamol*	Oral liquid: 125 mg/5 ml. Suppository: 100 mg. Tablet: 100 mg to 500 mg. * Not recommended for anti-inflammatory use due to lack of proven benefit to that effect.

<i>Complementary List</i>	
acetylsalicylic acid*	Suppository: 50 mg to 150 mg. Tablet: 100 mg to 500 mg. <i>* For use for rheumatic fever, juvenile arthritis, Kawasaki disease.</i>
2.2 Opioid analgesics	
codeine	Tablet: 15 mg (phosphate).
morphine	Injection: 10 mg (morphine hydrochloride or morphine sulfate) in 1-ml ampoule. Oral liquid: 10 mg (morphine hydrochloride or morphine sulfate)/5 ml. Tablet: 10 mg (morphine sulfate). Tablet (prolonged release): 10 mg; 30 mg; 60 mg (morphine sulfate).
2.3 Medicines used to treat gout	
2.4 Disease modifying agents used in rheumatoid disorders (DMARDs)^R	
^R The Subcommittee noted that there is a need for medicines for the treatment of juvenile arthritis but did not endorse any of the currently listed medicines at this time, requesting a review of this section.	
3. ANTIALLERGICS AND MEDICINES USED IN ANAPHYLAXIS	
□ chlorphenamine ^a ^R	Injection: 10 mg (hydrogen maleate) in 1-ml ampoule. Oral liquid: 2 mg/5 ml. Tablet: 4 mg (hydrogen maleate). ^a >1 year. ^R Review of diphenhydramine to assess comparative efficacy and safety with chlorphenamine as a possible preferable alternative.
dexamethasone	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	Oral liquid: 5 mg/ml. Tablet: 5 mg; 25 mg.
4. ANTIDOTES AND OTHER SUBSTANCES USED IN POISONINGS	
4.1 Non-specific	
charcoal, activated	Powder.
4.2 Specific	
acetylcysteine	Injection: 200 mg/ml in 10-ml ampoule. Oral liquid: 10% and 20%.
atropine	Injection: 1 mg (sulfate) in 1-ml ampoule.
calcium gluconate	Injection: 100 mg/ml in 10-ml ampoule.

deferoxamine R	Powder for injection: 500 mg (mesilate) in vial. R Review use of oral iron and lead chelators in children.
dimercaprol	Injection in oil: 50 mg/ml in 2-ml ampoule.
naloxone	Injection: 400 micrograms (hydrochloride) in 1-ml ampoule.
penicillamine R	Solid oral dosage form: 250 mg. R Comparative effectiveness and safety versus sodium calcium edetate.
sodium calcium edetate R	Injection: 200 mg/ml in 5-ml ampoule. R Comparative effectiveness and safety versus penicillamine.
5. ANTICONVULSANTS / ANTIEPILEPTICS	
carbamazepine	Oral liquid: 100 mg/5 ml. Tablet (chewable): 100 mg; 200 mg. Tablet (scored): 100 mg; 200 mg.
diazepam	Gel or rectal solution: 5 mg/ml in 0.5 ml; 2-ml and 4-ml tubes.
□ lorazepam	Parenteral formulation: 2 mg/ml in 1-ml ampoule; 4 mg/ml in 1-ml ampoule.
phenobarbital	Injection: 200 mg/ml (phenobarbital sodium). Oral liquid: 15 mg/5 ml (phenobarbital). Tablet: 15 mg to 100 mg (phenobarbital).
phenytoin	Capsule: 25 mg; 50 mg; 100 mg (sodium salt). Injection: 50 mg/ml in 5-ml vial (sodium salt). Oral liquid: 25 mg to 30 mg/5 ml.* Tablet: 25 mg; 50 mg; 100 mg (sodium salt). Tablet (chewable): 50 mg. * The presence of both 25 mg/5 ml and 30 mg/5 ml strengths on the same market would cause confusion in prescribing and dispensing and should be avoided.
valproic acid (sodium valproate)	Oral liquid: 200 mg/5 ml. Tablet (crushable): 100 mg. Tablet (enteric-coated): 200 mg; 500 mg (sodium valproate).
<i>Complementary List</i>	
<i>ethosuximide</i>	Capsule: 250 mg. Oral liquid: 250 mg/5 ml.
6. ANTI-INFECTIONAL MEDICINES	
6.1 Anthelmintics R R Review evidence of efficacy and safety of use of anthelmintic/antifilarial/antischistosomal and antitrepanematode medicines in children below the specified age in current licences.	
6.1.1 Intestinal anthelmintics R	
albendazole	Tablet (chewable): 400 mg.

levamisole	Tablet: 50 mg; 150 mg (as hydrochloride).
☐ mebendazole	Tablet (chewable): 100 mg; 500 mg.
niclosamide*	Tablet (chewable): 500 mg. * Niclosamide is listed for use when praziquantel treatment fails.
praziquantel	Tablet: 150 mg; 600 mg.
pyrantel	Oral liquid: 50 mg (as embonate)/ml. Tablet (chewable): 250 mg (as embonate).
6.1.2 Antifilarials R	
ivermectin	Tablet (scored): 3 mg; 6 mg.
<i>Complementary List</i>	
<i>diethylcarbamazine</i>	Tablet: 50 mg; 100 mg (dihydrogen citrate).
6.1.3 Antischistosomal and antitremaatode medicines R	
praziquantel	Tablet: 600 mg.
triclabendazole	Tablet: 250 mg.
<i>Complementary List</i>	
<i>oxamniquine*</i>	Capsule: 250 mg. Oral liquid: 250 mg/5 ml. * Oxamniquine is listed for use when praziquantel treatment fails.
6.2 Antibacterials	
6.2.1 Beta Lactam medicines	
amoxicillin	Powder for oral liquid: 125 mg (anhydrous)/5 ml; 250 mg (anhydrous)/5 ml. Solid oral dosage form: 250 mg; 500 mg (anhydrous).
amoxicillin + clavulanic acid	Oral liquid: 125 mg amoxicillin + 31.25 mg clavulanic acid/5 ml AND 250 mg amoxicillin + 62.5 mg clavulanic acid/5 ml. Tablet: 500 mg + 125 mg.
ampicillin	Powder for injection: 500 mg; 1 g (as sodium salt) in vial.
benzathine benzylpenicillin	Powder for injection: 900 mg benzylpenicillin (=1.2 million IU) in 5-ml vial; 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.
cefalexin	Powder for reconstitution with water: 125 mg/5 ml; 250 mg/5 ml. Solid oral dosage form: 250 mg.
☐ cefazolin* a	Powder for injection: 1 g (as sodium salt) in vial. * For surgical prophylaxis. a >1 month.

ceftriaxone* 	Powder for injection: 250 mg; 1 g (as sodium salt) in vial. * Do not administer with calcium and avoid in infants with hyperbilirubinemia.  >41 weeks corrected gestational age.
 cloxacillin	Capsule: 500 mg; 1 g (as sodium salt). Powder for injection: 500 mg (as sodium salt) in vial. Powder for oral liquid: 125 mg (as sodium salt)/5 ml.
phenoxymethylpenicillin	Powder for oral liquid: 250 mg (as potassium salt)/5 ml. Tablet: 250 mg (as potassium salt).
procaine benzylpenicillin*	Powder for injection: 1 g (=1 million IU); 3 g (=3 million IU) in vial. * Procaine benzylpenicillin is not recommended as first-line treatment for neonatal sepsis except in settings with high neonatal mortality, when given by trained health workers in cases where hospital care is not achievable.
Complementary List	
cefotaxime*	Powder for injection: 250 mg per vial. * 3rd generation cephalosporin of choice for use in hospitalized neonates.
ceftazidime	Powder for injection: 250 mg or 1 g (as pentahydrate) 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. * Only listed for the treatment of life-threatening hospital-based infection due to suspected or proven multidrug-resistant infection. Meropenem is indicated for the treatment of meningitis and is licensed for use in children over the age of 3 months.
6.2.2 Other antibacterials	
azithromycin*	Capsule: 250 mg; 500 mg. Oral liquid: 200 mg/5 ml. * Only listed for trachoma.
chloramphenicol	Capsule: 250 mg. Oily suspension for injection*: 0.5 g (as sodium succinate)/ml in 2-ml ampoule. * Only for the presumptive treatment of epidemic meningitis in children older than 2 years. Oral liquid: 150 mg (as palmitate)/5 ml. Powder for injection: 1 g (sodium succinate) in vial.
ciprofloxacin 	Oral liquid: 250 mg/5 ml. Solution for IV infusion: 2 mg/ml. Tablet: 250 mg (as hydrochloride).

doxycycline ^a	Oral liquid: 25 mg/5 ml; 50 mg/5 ml. Solid oral dosage form: 50 mg; 100 mg (hydrochloride). ^a Use in children <8 years only for life-threatening infections when no alternative exists.
erythromycin	Powder for oral liquid: 125 mg/5 ml (as stearate or ethyl succinate). Solid oral dosage form: 250 mg (as stearate or ethyl succinate).
□ gentamicin	Injection: 10 mg; 40 mg (as sulfate)/ml in 2-ml vial.
metronidazole	Injection: 500 mg in 100-ml vial. Oral liquid: 200 mg (as benzoate)/5 ml. Tablet: 200 mg to 500 mg.
nitrofurantoin	Oral liquid: 25 mg/5 ml. Tablet: 100 mg.
sulfamethoxazole + trimethoprim	Injection: 80 mg + 16 mg/ml in 5-ml ampoule; 80 mg + 16 mg/ml in 10-ml ampoule. Oral liquid: 200 mg + 40 mg/5 ml. Tablet: 100 mg + 20 mg; 400 mg + 80 mg.
trimethoprim ^a	Oral liquid: 50 mg/5 ml. Tablet: 100 mg; 200 mg. ^a >6 months.
Complementary List	
clindamycin	Capsule: 150 mg. Injection: 150 mg (as phosphate)/ml. Oral liquid: 75 mg/5 ml.
vancomycin	Powder for injection: 250 mg (as hydrochloride) in vial.
6.2.3 Antileprosy medicines	
Medicines used in the treatment of leprosy should never be used except in combination. Combination therapy is essential to prevent the emergence of drug resistance. Colour coded blister packs (MDT blister packs) containing standard two medicine (paucibacillary leprosy) or three medicine (multibacillary leprosy) combinations for adult and childhood leprosy should be used. MDT blister packs can be supplied free of charge through WHO.	
clofazimine	Capsule: 50 mg; 100 mg.
dapsone	Tablet: 25 mg; 50 mg; 100 mg.
rifampicin	Solid oral dosage form: 150 mg; 300 mg.

6.2.4 Antituberculosis medicines

The Subcommittee recommends and endorses the use of fixed-dose combinations and the development of appropriate new fixed-dose combinations, including modified dosage forms, non-refrigerated products and paediatric dosage forms of assured pharmaceutical quality.

ethambutol	Oral liquid: 25 mg/ml. Tablet: 100 mg; 400 mg (hydrochloride).
isoniazid	Oral liquid: 50 mg/5 ml. Tablet: 100 mg; 300 mg. Tablet (scored): 50 mg.
pyrazinamide	Oral liquid: 30 mg/ml. Tablet: 400 mg. Tablet (dispersible): 150 mg. Tablet (scored): 150 mg.
rifampicin	Oral liquid: 20 mg/ml. Solid oral dosage form: 150 mg; 300 mg.
streptomycin R	Powder for injection: 1 g (as sulfate) in vial. R Review of safety and efficacy of streptomycin in childhood TB.

Complementary List

*Reserve second-line drugs for the treatment of multidrug-resistant tuberculosis (MDR-TB) should be used in specialized centres adhering to WHO standards for TB control. **R***

R The Subcommittee requests a review of the medicines for MDR-TB in children.

amikacin	Powder for injection: 100 mg; 500 mg; 1 g in vial.
capreomycin	Powder for injection: 1 g in vial.
cycloserine	Solid oral dosage form: 250 mg.
ethionamide	Tablet: 125 mg; 250 mg.
kanamycin	Powder for injection: 1 g in vial.
ofloxacin*	Tablet: 200 mg; 400 mg. * Levofloxacin may be an alternative based on availability and programme considerations.
p-aminosalicylic acid	Granules: 4 g in sachet. Tablet: 500 mg.

6.3 Antifungal medicines

fluconazole	Capsule: 50 mg. Injection: 2 mg/ml in vial. Oral liquid: 50 mg/5 ml.
griseofulvin	Oral liquid: 125 mg/5 ml. Solid oral dosage form: 125 mg; 250 mg.

nystatin	Lozenge: 100 000 IU. Oral liquid: 50 mg/5 ml; 100 000 IU/ml. Tablet: 100 000 IU; 500 000 IU.
Complementary List	
amphotericin B	Powder for injection: 50 mg in vial. <i>As deoxycholate or liposomal.</i>
flucytosine	Capsule: 250 mg. Infusion: 2.5 g in 250 ml.
potassium iodide	Saturated solution.
6.4 Antiviral medicines	
6.4.1 Antiherpes medicines	
aciclovir	Oral liquid: 200 mg/5 ml. Powder for injection: 250 mg (as sodium salt) in vial. Tablet: 200 mg.
6.4.2 Antiretrovirals	
Based on current evidence and experience of use, medicines in the following three classes of antiretrovirals are included as essential medicines for treatment and prevention of HIV (prevention of mother-to-child transmission and post-exposure prophylaxis). The Subcommittee emphasizes the importance of using these products in accordance with global and national guidelines. The Subcommittee recommends and endorses the use of fixed-dose combinations and the development of appropriate new fixed-dose combinations, including modified dosage forms, non-refrigerated products and paediatric dosage forms of assured pharmaceutical quality. Scored tablets can be used in children and therefore can be considered for inclusion in the listing of tablets, provided adequate quality products are available.	
6.4.2.1 Nucleoside /Nucleotide reverse transcriptase inhibitors	
abacavir (ABC)	Oral liquid: 100 mg (as sulfate)/5 ml. Tablet: 300 mg (as sulfate).
didanosine (ddI)	Buffered powder for oral liquid: 100 mg; 167 mg; 250 mg packets. Capsule (unbuffered enteric-coated): 125 mg; 200 mg; 250 mg; 400 mg. Tablet (buffered chewable, dispersible): 25 mg; 50 mg; 100 mg; 150 mg; 200 mg.
emtricitabine (FTC)* 	Capsule: 200 mg. Oral liquid: 10 mg/ml. * FTC is an acceptable alternative to 3TC, based on knowledge of the pharmacology, the resistance patterns and clinical trials of antiretrovirals.  >3 months.
lamivudine (3TC)	Oral liquid: 50 mg/5 ml. Tablet: 150 mg.

stavudine (d4T)	Capsule: 15 mg; 20 mg; 30 mg. Powder for oral liquid: 5 mg/5 ml.
zidovudine (ZDV or AZT)	Capsule: 100 mg; 250 mg. Oral liquid: 50 mg/5 ml. Solution for IV infusion injection: 10 mg/ml in 20-ml vial. Tablet: 300 mg.
6.4.2.2 Non-nucleoside reverse transcriptase inhibitors	
efavirenz (EFV or EFZ) ^a	Capsule: 50 mg; 100 mg; 200 mg. Oral liquid: 150 mg/5 ml. Tablet: 600 mg. ^a >3 years or >10 kg.
nevirapine (NVP)	Oral liquid: 50 mg/5 ml. Tablet: 200 mg.
6.4.2.3 Protease inhibitors	
Selection of protease inhibitor(s) from the Model List will need to be determined by each country after consideration of international and national treatment guidelines and experience. Ritonavir is recommended for use in combination as a pharmacological booster, and not as an antiretroviral in its own right. All other protease inhibitors should be used in boosted forms (e.g. with ritonavir).	
atazanavir ^a	Solid oral dosage form: 100 mg; 150 mg; 300 mg. ^a >25 kg.
lopinavir + ritonavir (LPV/r)	Capsule: 133.3 mg + 33.3 mg. Oral liquid: 400 mg + 100 mg/5 ml. Tablet (heat stable): 100 mg + 25 mg; 200 mg + 50 mg.
ritonavir	Oral liquid: 400 mg/5 ml. Solid oral dosage form: 100 mg. Tablet (heat stable): 25 mg; 100 mg.
saquinavir (SQV) ^a	Solid oral dosage form: 200 mg. ^a >25 kg.
FIXED-DOSE COMBINATIONS	
lamivudine + nevirapine + stavudine	Tablet: 150 mg + 200 mg + 30 mg. Tablet (dispersible): 30 mg + 50 mg + 6 mg; 60 mg + 100 mg + 12 mg.
lamivudine + nevirapine + zidovudine	Tablet: 30 mg + 50 mg + 60 mg; 150 mg + 200 mg + 300 mg.
lamivudine + zidovudine	Tablet: 30 mg + 60 mg; 150 mg + 300 mg.

6.4.3 Other antivirals

oseltamivir* R	Capsule: 30 mg; 45 mg; 75 mg. Oral powder: 12 mg/ml. * Oseltamivir should be used only in compliance with the WHO treatment guidelines, i.e. (1) for treatment of patients with severe or progressive clinical illness with confirmed or suspected influenza pandemic (H1N1) 2009, (2) for the treatment of patients with confirmed or suspected but uncomplicated illness due to pandemic influenza virus infection who were in higher risk groups, most notably for pregnant women and children under 2 years of age. R The Committee recommended that its decision to include oseltamivir be reviewed at the next meeting of the Expert Committee.
ribavirin*	Injection for intravenous administration: 800 mg and 1 g in 10-ml phosphate buffer solution. Solid oral dosage form: 200 mg; 400 mg; 600 mg. * For the treatment of viral haemorrhagic fevers only.

6.5 Antiprotozoal medicines

6.5.1 Antiamoebic and anti giardiasis medicines

diloxanide a R	Tablet: 500 mg (furoate). a > 25 kg. R Review of effectiveness and safety for amoebiasis, with emphasis on comparative efficacy, safety, and age limits compared with oral paromomycin.
☐ metronidazole	Injection: 500 mg in 100-ml vial. Oral liquid: 200 mg (as benzoate)/5 ml. Tablet: 200 mg to 500 mg.

6.5.2 Antileishmaniasis medicines

amphotericin B	Powder for injection: 50 mg in vial. As deoxycholate or liposomal.
paromomycin	Solution for intramuscular injection: 750 mg of paromomycin base present as the sulfate.
sodium stibogluconate or meglumine antimoniate R	Injection: 100 mg/ml, 1 vial = 30 ml or 30%, equivalent to approximately 8.1% antimony in 5-ml ampoule. R Review of comparative effectiveness and safety of antimonials for leishmaniasis, and whether they should be kept on the core list or moved to the complementary list.

6.5.3 Antimalarial medicines

6.5.3.1 For curative treatment

Medicines for the treatment of *P. falciparum* malaria cases should be used in combination. The list currently recommends combinations according to treatment guidelines. The Subcommittee recognizes that not all of these FDCs exist and encourages their development and rigorous testing. The Subcommittee also encourages development and testing of rectal dosage formulations.

amodiaquine*	Tablet: 153 mg or 200 mg (as hydrochloride). * To be used (a) in combination with artesunate 50 mg OR (b) may be used alone for the treatment of <i>P.vivax</i>, <i>P.ovale</i> and <i>P.malariae</i> infections.
artemether*	Oily injection: 80 mg/ml in 1-ml ampoule. * For use in the management of severe malaria.
artemether + lumefantrine*	Tablet: 20 mg + 120 mg. Tablet (dispersible): 20 mg + 120 mg. * Not recommended in the first trimester of pregnancy or in children below 5 kg.
artesunate*	Injection: ampoules, containing 60 mg anhydrous artesunic acid with a separate ampoule of 5% sodium bicarbonate solution. For use in the management of severe malaria. Rectal dosage form: 50 mg; 200 mg capsules (for pre-referral treatment of severe malaria only; patients should be taken to an appropriate health facility for follow-up care). Tablet: 50 mg. * To be used in combination with either amodiaquine, mefloquine or sulfadoxine + pyrimethamine.
chloroquine*	Oral liquid: 50 mg (as phosphate or sulfate)/5 ml. Tablet: 100 mg; 150 mg (as phosphate or sulfate). * For use only for the treatment of <i>P.vivax</i> infection.
doxycycline*	Capsule: 100 mg (as hydrochloride). Tablet (dispersible): 100 mg (as monohydrate). * For use only in combination with quinine.
mefloquine*	Tablet: 250 mg (as hydrochloride). * To be used in combination with artesunate 50 mg.
primaquine*	Tablet: 7.5 mg; 15 mg (as diphosphate). * Only for use to achieve radical cure of <i>P.vivax</i> and <i>P.ovale</i> infections, given for 14 days.
quinine*	Injection: 300 mg quinine hydrochloride/ml in 2-ml ampoule. Tablet: 300 mg (quinine sulfate) or 300 mg (quinine bisulfate). * For use only in the management of severe malaria, and should be used in combination with doxycycline.

sulfadoxine + pyrimethamine*	Tablet: 500 mg + 25 mg. * Only in combination with artesunate 50 mg.
6.5.3.2 For prophylaxis	
chloroquine*	Oral liquid: 50 mg (as phosphate or sulfate)/5 ml. Tablet: 150 mg (as phosphate or sulfate). * For use only for the treatment of <i>P.vivax</i> infection.
doxycycline [a]	Solid oral dosage form: 100 mg (as hydrochloride). [a] >8 years.
mefloquine [a]	Tablet: 250 mg (as hydrochloride). [a] >5 kg or >3 months.
proguanil*	Tablet: 100 mg (as hydrochloride). * For use only in combination with chloroquine.
6.5.4 Antipneumocystosis and antitoxoplasmosis medicines	
pyrimethamine	Tablet: 25 mg.
sulfadiazine	Tablet: 500 mg.
sulfamethoxazole + trimethoprim	Injection: 80 mg + 16 mg/ml in 5-ml ampoule; 80 mg + 16 mg/ml in 10-ml ampoule. Oral liquid: 200 mg + 40 mg/5 ml. Tablet: 100 mg + 20 mg; 400 mg + 80 mg.
6.5.5 Antitrypanosomal medicines [R]	
[R] The Subcommittee requested a review of evidence for effectiveness and safety for medicines for trypanosomiasis in children.	
6.5.5.1 African trypanosomiasis	
Medicines for the treatment of 1st stage African trypanosomiasis.	
pentamidine*	Powder for injection: 200 mg (pentamidine isetionate) in vial. * To be used for the treatment of <i>Trypanosoma brucei gambiense</i> infection.
suramin sodium*	Powder for injection: 1 g in vial. * To be used for the treatment of the initial phase of <i>Trypanosoma brucei rhodesiense</i> infection.
Medicines for the treatment of 2nd stage African trypanosomiasis	
eflornithine*	Injection: 200 mg (hydrochloride)/ml in 100-ml bottle. * To be used for the treatment of <i>Trypanosoma brucei gambiense</i> infection.
melarsoprol	Injection: 3.6% solution in 5-ml ampoule (180 mg of active compound).
6.5.5.2 American trypanosomiasis	
benznidazole	Tablet: 100 mg.

nifurtimox	Tablet: 30 mg; 120 mg; 250 mg.
7. ANTIMIGRAINE MEDICINES	
7.1 For treatment of acute attack	
ibuprofen	Tablet: 200 mg; 400 mg.
paracetamol	Oral liquid: 125 mg/5 ml. Tablet: 300 mg to 500 mg.
7.2 For prophylaxis	
propranolol	Tablet: 20 mg; 40 mg (hydrochloride).
8. ANTINEOPLASTIC, IMMUNOSUPPRESSIVES AND MEDICINES USED IN PALLIATIVE CARE 	
 The Subcommittee noted that these immunosuppressives and cytotoxics are essential for children but requested that these medicines be reviewed.	
8.1 Immunosuppressive medicines	
<i>Complementary List</i>	
azathioprine	Powder for injection: 100 mg (as sodium salt) in vial. Tablet: 50 mg.
ciclosporin	Capsule: 25 mg. Concentrate for injection: 50 mg/ml in 1-ml ampoule for organ transplantation.
8.2 Cytotoxic medicines	
<i>Complementary List</i>	
allopurinol	Tablet: 100 mg to 300 mg.
asparaginase	Powder for injection: 10 000 IU in vial.
bleomycin	Powder for injection: 15 mg (as sulfate) in vial.
calcium folinate	Injection: 3 mg/ml in 10-ml ampoule. Tablet: 15 mg.
 carboplatin	Injection: 50 mg/5 ml; 150 mg/15 ml; 450 mg/45 ml; 600 mg/60 ml.
chlorambucil	Tablet: 2 mg.
cyclophosphamide	Powder for injection: 500 mg in vial. Tablet: 25 mg.
cytarabine	Powder for injection: 100 mg in vial.
dacarbazine	Powder for injection: 100 mg in vial.
dactinomycin	Powder for injection: 500 micrograms in vial.
daunorubicin	Powder for injection: 50 mg (as hydrochloride).
doxorubicin	Powder for injection: 10 mg; 50 mg (hydrochloride) in vial.
etoposide	Capsule: 100 mg. Injection: 20 mg/ml in 5-ml ampoule.

<i>fluorouracil</i>	Injection: 50 mg/ml in 5-ml ampoule.
<i>mercaptopurine</i>	Tablet: 50 mg.
<i>methotrexate</i>	Powder for injection: 50 mg (as sodium salt) in vial. Tablet: 2.5 mg (as sodium salt).
<i>procarbazine</i>	Capsule: 50 mg (as hydrochloride).
<i>vinblastine</i>	Powder for injection: 10 mg (sulfate) in vial.
<i>vincristine</i>	Powder for injection: 1 mg; 5 mg (sulfate) in vial.
8.3 Hormones and antihormones	
Complementary List	
<i>dexamethasone</i>	Injection: 4 mg dexamethasone phosphate (as disodium salt) in 1-ml ampoule. Oral liquid: 2 mg/5 ml.
<i>hydrocortisone</i>	Powder for injection: 100 mg (as sodium succinate) in vial.
<i>prednisolone</i>	Oral liquid: 5 mg/ml. Tablet: 5 mg; 25 mg.
8.4 Medicines used in palliative care	
amitriptyline	Tablet: 10 mg; 25 mg.
cyclizine	Injection: 50 mg/ml. Tablet: 50 mg.
dexamethasone	Injection: 4 mg/ml. Tablet: 2 mg.
diazepam	Injection: 5 mg/ml. Oral liquid: 2 mg/5 ml. Rectal solution: 2.5 mg; 5 mg; 10 mg. Tablet: 5 mg; 10 mg.
docusate sodium	Capsule: 100 mg. Oral liquid: 50 mg/5 ml.
hyoscine hydrobromide	Injection: 400 micrograms/ml; 600 micrograms/ml. Transdermal patches: 1 mg/72 hours.
ibuprofen* ^a	Oral liquid: 100 mg/5 ml. Tablet: 200 mg; 400 mg; 600 mg. * Specific use for management of bone pain. ^a Not in children less than 3 months.
midazolam	Injection: 1 mg/ml; 5 mg/ml.

morphine	Granules (modified release) (to mix with water): 20 mg; 30 mg; 60 mg; 100 mg; 200 mg. Injection: 10 mg/ml. Oral liquid: 10 mg/5 ml. Tablet (controlled release): 10 mg; 30 mg; 60 mg. Tablet (immediate release): 10 mg.
senna	Oral liquid: 7.5 mg/5 ml.
9. ANTIPARKINSONISM MEDICINES	
10. MEDICINES AFFECTING THE BLOOD	
10.1 Antianaemia medicines ^R	
^R The Subcommittee proposed a review of the evidence for appropriate dose combinations of iron and folic acid for children.	
ferrous salt	Oral liquid: equivalent to 25 mg iron (as sulfate)/ml. Tablet: equivalent to 60 mg iron.
folic acid	Tablet: 1 mg; 5 mg.
hydroxocobalamin	Injection: 1 mg in 1-ml ampoule.
10.2 Medicines affecting coagulation	
phytomenadione	Injection: 1 mg/ml; 10 mg/ml in 5-ml ampoule. Tablet: 10 mg.
<i>Complementary List</i>	
heparin sodium	Injection: 1000 IU/ml; 5000 IU/ml in 1-ml ampoule.
protamine sulfate	Injection: 10 mg/ml in 5-ml ampoule.
☐ warfarin	Tablet: 0.5 mg; 1 mg; 2 mg; 5 mg (sodium salt).
11. BLOOD PRODUCTS AND PLASMA SUBSTITUTES	
11.1 Plasma substitutes ^R	
^R The Subcommittee requested a review to determine whether these medicines are essential for children.	
11.2 Plasma fractions for specific use	
All plasma fractions should comply with the WHO Requirements for the Collection, Processing and Quality Control of Blood, Blood Components and Plasma Derivatives (Revised 1992). (WHO Technical Report Series, No. 840, 1994, Annex 2).	
<i>Complementary List</i>	
☐ factor VIII concentrate	Dried.
☐ factor IX complex (coagulation factors, II, VII, IX, X) concentrate	Dried.

human normal immunoglobulin	Intramuscular administration: 16% protein solution.* Intravenous administration: 5%; 10% protein solution.** Subcutaneous administration: 15%; 16% protein solution.* * Indicated for primary immune deficiency. **Indicated for primary immune deficiency and Kawasaki disease.
12. CARDIOVASCULAR MEDICINES	
12.1 Antianginal medicines	
12.2 Antiarrhythmic medicines R	
R The Subcommittee noted the potential importance of these medicines and requested a review to determine which of these medicines are essential for children.	
12.3 Antihypertensive medicines	
☐ enalapril	Tablet: 2.5 mg; 5 mg.
12.4 Medicines used in heart failure	
digoxin	Injection: 250 micrograms/ml in 2-ml ampoule. Oral liquid: 50 micrograms/ml. Tablet: 62.5 micrograms; 250 micrograms.
furosemide	Injection: 10 mg/ml in 2-ml ampoule. Oral liquid: 20 mg/5 ml. Tablet: 40 mg.
<i>Complementary List</i>	
dopamine R	Injection: 40 mg (hydrochloride) in 5-ml vial. R Review of safety and efficacy of dopamine in children.
12.5 Antithrombotic medicines	
12.6 Lipid-lowering agents R	
R The Subcommittee noted the potential importance of these medicines in children but requested a review of the section before endorsing any medicine as essential.	
13. DERMATOLOGICAL MEDICINES (topical)	
13.1 Antifungal medicines	
benzoic acid + salicylic acid	Cream or ointment: 6% + 3%.
☐ miconazole	Cream or ointment: 2% (nitrate).
<i>Complementary List</i>	
selenium sulfide	Detergent-based suspension: 2%.
13.2 Anti-infective medicines R	
R The Subcommittee requested a review of safety of topical antibiotics including tetracycline ointment in neonates.	
☐ methylrosanilinium chloride (gentian violet) R	Aqueous solution: 0.5%. Tincture: 0.5%. R Review of safety and toxicity of gentian violet.
neomycin sulfate + ☐ bacitracin	Ointment: 5 mg neomycin sulfate + 250 IU bacitracin zinc/g.

potassium permanganate	Aqueous solution: 1:10 000.
silver sulfadiazine a	Cream: 1% a >2 months.
13.3 Anti-inflammatory and antipruritic medicines	
☐ betamethasone a	Cream or ointment: 0.1% (as valerate). a Hydrocortisone preferred in neonates.
calamine lotion	Lotion.
hydrocortisone	Cream or ointment: 1% (acetate).
13.4 Astringent medicines R	
R The Subcommittee requested a review to determine whether these medicines are essential for children.	
13.5 Medicines affecting skin differentiation and proliferation	
benzoyl peroxide	Cream or lotion: 5%.
coal tar	Solution: 5%.
☐ podophyllum resin	Solution: 10% to 25%.
salicylic acid	Solution: 5%.
urea	Cream or ointment: 10%.
13.6 Scabicides and pediculicides	
☐ benzyl benzoate a R	Lotion: 25%. a >2 years. R Review of alternatives to benzyl benzoate for use in younger children (possible role for sulfur-based preparations in younger children).
permethrin	Cream: 5%. Lotion: 1%.
14. DIAGNOSTIC AGENTS	
14.1 Ophthalmic medicines	
fluorescein	Eye drops: 1% (sodium salt).
☐ tropicamide	Eye drops: 0.5%.
14.2 Radiocontrast media R	
R The Subcommittee requested a review of possible alternative contrast agents for use in children.	
<i>Complementary List</i>	
<i>barium sulfate</i>	<i>Aqueous suspension.</i>
15. DISINFECTANTS AND ANTISEPTICS	
15.1 Antiseptics	
☐ chlorhexidine	Solution: 5% (digluconate); 20% (digluconate) (needs to be diluted prior to use for cord care).
☐ ethanol	Solution: 70% (denatured).
☐ polyvidone iodine	Solution: 10%.

15.2 Disinfectants	
☐ chlorine base compound	Powder: (0.1% available chlorine) for solution.
☐ chloroxylenol	Solution: 4.8%.
glutaral	Solution: 2%.
16. DIURETICS	
furosemide	Injection: 10 mg/ml in 2-ml ampoule. Oral liquid: 20 mg/5 ml. Tablet: 10 mg; 20 mg; 40 mg.
<i>Complementary List</i>	
☐ hydrochlorothiazide	Tablet (scored): 25 mg.
mannitol R	Injectable solution: 10%; 20%. R Review of comparative efficacy, safety and place in therapy of mannitol in children.
spironolactone R	Oral liquid: 5 mg/5 ml; 10 mg/5 ml; 25 mg/5 ml. Tablet: 25 mg. R Review of comparative efficacy, safety and place in therapy of spironolactone in children.
17. GASTROINTESTINAL MEDICINES	
<i>Complementary List</i>	
☐ pancreatic enzymes	<i>Age-appropriate formulations and doses including lipase, protease and amylase.</i>
17.1 Antacids and other antiulcer medicines	
aluminium hydroxide	Oral liquid: 320 mg/5 ml. Tablet: 500 mg.
magnesium hydroxide	Oral liquid: equivalent to 550 mg magnesium oxide/10 ml.
☐ omeprazole	Powder for oral liquid: 20 mg; 40 mg sachets. Solid oral dosage form: 10 mg; 20 mg; 40 mg.
☐ ranitidine	Injection: 25 mg/ml in 2-ml ampoule. Oral liquid: 75 mg/5 ml. Tablet: 150 mg (as hydrochloride).
17.2 Antiemetic medicines	
dexamethasone	Injection: 4 mg/ml in 1-ml ampoule. Oral liquid: 0.5 mg/5 ml; 2 mg/5 ml. Solid oral dosage form: 0.5 mg; 0.75 mg; 1.5 mg; 4 mg.

metoclopramide ^a	Injection: 5 mg (hydrochloride)/ml in 2-ml ampoule. Oral liquid: 5 mg/5 ml. Tablet: 10 mg (hydrochloride). ^a Not in neonates.
ondansetron ^a	Injection: 2 mg base/ml in 2-ml ampoule (as hydrochloride). Oral liquid: 4 mg base/ 5 ml. Solid oral dosage form: Eq 4 mg base; Eq 8 mg base. ^a >1 month.
17.3 Anti-inflammatory medicines	
17.4 Laxatives ^R ^R The Subcommittee noted the potential importance of these medicines in children but requested a review of the section before endorsing any medicine as essential.	
17.5 Medicines used in diarrhoea	
17.5.1 Oral rehydration	
oral rehydration salts	glucose: 75 mEq sodium: 75 mEq or mmol/L chloride: 65 mEq or mmol/L potassium: 20 mEq or mmol/L citrate: 10 mmol/L osmolarity: 245 mOsm/L glucose: 13.5 g/L sodium chloride: 2.6 g/L potassium chloride: 1.5 g/L trisodium citrate dihydrate+: 2.9 g/L + 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. Powder for dilution in 200 ml; 500 ml; 1 L.
17.5.2 Medicines for diarrhoea in children	
zinc sulfate*	Oral liquid: in 10 mg per unit dosage forms. Tablet: in 10 mg per unit dosage forms. * In acute diarrhoea zinc sulfate should be used as an adjunct to oral rehydration salts.
17.5.3 Antidiarrhoeal (symptomatic) medicines in adults	
18. HORMONES, OTHER ENDOCRINE MEDICINES AND CONTRACEPTIVES	
18.1 Adrenal hormones and synthetic substitutes	
fludrocortisone	Tablet: 100 micrograms.
hydrocortisone	Tablet: 5 mg; 10 mg; 20 mg.
18.2 Androgens	
18.3 Contraceptives	

18.3.1 Oral hormonal contraceptives	
18.3.2 Injectable hormonal contraceptives	
18.3.3 Intrauterine devices	
18.3.4 Barrier methods	
18.3.5 Implantable contraceptives	
18.4 Estrogens	
18.5 Insulins and other antidiabetic agents	
insulin injection (soluble)	Injection: 100 IU/ml in 10-ml vial.
intermediate-acting insulin	Injection: 100 IU/ml in 10-ml vial (as compound insulin zinc suspension or isophane insulin).
<i>Complementary List</i>	
<i>metformin</i>	Tablet: 500 mg (hydrochloride).
18.6 Ovulation inducers	
18.7 Progestogens	
18.8 Thyroid hormones and antithyroid medicines	
levothyroxine	Tablet: 25 micrograms; 50 micrograms; 100 micrograms (sodium salt).
<i>Complementary List</i>	
<i>Lugol's solution</i>	Oral liquid: about 130 mg total iodine/ml.
<i>potassium iodide</i>	Tablet: 60 mg.
<i>propylthiouracil</i> R	Tablet: 50 mg. R Review of use of propylthiouracil in children and appropriateness of carbimazole as an alternative.
19. IMMUNOLOGICALS	
19.1 Diagnostic agents	
All tuberculins should comply with the WHO Requirements for Tuberculins (Revised 1985). WHO Expert Committee on Biological Standardization. Thirty-sixth report. (WHO Technical Report Series, No. 745, 1987, Annex 1).	
tuberculin, purified protein derivative (PPD)	Injection.
19.2 Sera and immunoglobulins	
All plasma fractions should comply with the WHO 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).	
antitetanus immunoglobulin (human)	Injection: 500 IU in vial.
antivenom immunoglobulin*	Injection. * Exact type to be defined locally.

diphtheria antitoxin	Injection: 10 000 IU; 20 000 IU in vial.
□ rabies immunoglobulin	Injection: 150 IU/ml in vial.
19.3 Vaccines	
Selection of vaccines from the Model List will need to be determined by each country after consideration of international recommendations, epidemiology and national priorities. The list below details the vaccines for which there is either a recommendation from the Strategic Advisory Group of Experts on Immunization (SAGE) (http://www.who.int/immunization/sage_conclusions/en/index.html) and/or a WHO position paper (http://www.who.int/immunization/documents/positionpapers/en/index.html). This site will be updated as new position papers are published and contains the most recent information and recommendations. All vaccines should comply with the WHO Requirements for Biological Substances. The Subcommittee noted the need for vaccines used in children to be polyvalent.	
BCG vaccine	
cholera vaccine	
diphtheria vaccine	
hepatitis A vaccine	
hepatitis B vaccine	
<i>Haemophilus influenzae</i> type b vaccine	
influenza vaccine	
Japanese encephalitis vaccine	
measles vaccine	
meningococcal meningitis vaccine	
mumps vaccine	
pertussis vaccine	
pneumococcal vaccine	
poliomyelitis vaccine	
rabies vaccine	
rotavirus vaccine	
rubella vaccine	
tetanus vaccine	
typhoid vaccine	
varicella vaccine	
yellow fever vaccine	

20. MUSCLE RELAXANTS (PERIPHERALLY-ACTING) AND CHOLINESTERASE INHIBITORS ^R

^R The Subcommittee recommended a review of the alternatives available for use in children.

neostigmine	Injection: 500 micrograms in 1-ml ampoule; 2.5 mg (metilsulfate) in 1-ml ampoule. Tablet: 15 mg (bromide).
suxamethonium	Injection: 50 mg (chloride)/ml in 2-ml ampoule. Powder for injection: (chloride), in vial.
☐ vecuronium	Powder for injection: 10 mg (bromide) in vial.

Complementary List

<i>pyridostigmine</i>	Injection: 1 mg in 1-ml ampoule. Tablet: 60 mg (bromide).
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21. OPHTHALMOLOGICAL PREPARATIONS ^R

^R The Subcommittee requested a review of newer medicines for potential additions to this list.

21.1 Anti-infective agents

aciclovir	Ointment: 3% W/W.
☐ gentamicin	Solution (eye drops): 0.3% (sulfate).
☐ tetracycline	Eye ointment: 1% (hydrochloride).

21.2 Anti-inflammatory agents

☐ prednisolone	Solution (eye drops): 0.5% (sodium phosphate).
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21.3 Local anaesthetics

☐ tetracaine ^a	Solution (eye drops): 0.5% (hydrochloride). ^a Not in preterm neonates.
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~~21.4 Miotics and antiglaucoma medicines~~

21.5 Mydriatics

atropine* ^a	Solution (eye drops): 0.1%; 0.5%; 1% (sulfate). * OR homatropine OR cyclopentolate. ^a > 3 months.
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Complementary List

<i>epinephrine (adrenaline)</i> ^R	Solution (eye drops): 2% (as hydrochloride). ^R Review of anti-infective eye drops, identifying which are most appropriate for use in children.
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~~22. OXYTOCICS AND ANTIOXYTOCICS~~

~~22.1 Oxytocics~~

~~22.2 Antioxytocics (tocolytics)~~

23. PERITONEAL DIALYSIS SOLUTION	
<i>Complementary List</i>	
<i>intraperitoneal dialysis solution (of appropriate composition)</i>	<i>Parenteral solution.</i>
24. PSYCHOTHERAPEUTIC MEDICINES ^R	
^R The Subcommittee noted the potential importance of these medicines in children for a variety of disorders and requests a review of the entire section before endorsing any medicine as essential.	
24.1 Medicines used in psychotic disorders	
<i>Complementary List</i>	
<i>chlorpromazine</i>	<i>Injection:</i> 25 mg (hydrochloride)/ml in 2-ml ampoule. <i>Oral liquid:</i> 25 mg (hydrochloride)/5 ml. <i>Tablet:</i> 10 mg; 25 mg; 50 mg; 100 mg (hydrochloride).
<i>haloperidol</i>	<i>Injection:</i> 5 mg in 1-ml ampoule. <i>Oral liquid:</i> 2 mg/ml. <i>Solid oral dosage form:</i> 0.5 mg; 2 mg; 5 mg.
24.2 Medicines used in mood disorders	
24.2.1 Medicines used in depressive disorders	
<i>Complementary List</i>	
<i>fluoxetine</i> ^a	<i>Solid oral dosage form:</i> 20 mg (present as hydrochloride). ^a >8 years.
24.2.2 Medicines used in bipolar disorders ^R	
24.3 Medicines used in generalized anxiety ^R	
24.4 Medicines used for obsessive compulsive disorders and panic attacks ^R	
24.5 Medicines used in substance dependence programmes ^R	
25. MEDICINES ACTING ON THE RESPIRATORY TRACT	
25.1 Antiasthmatic medicines	
☐ budesonide	Inhalation (aerosol): 100 micrograms per dose; 200 micrograms per dose.
epinephrine (adrenaline)	Injection: 1 mg (as hydrochloride or hydrogen tartrate) in 1-ml ampoule.
☐ salbutamol*	Injection: 50 micrograms (as sulfate)/ml in 5-ml ampoule. Metered dose inhaler (aerosol): 100 micrograms (as sulfate) per dose. Oral liquid: 2 mg/5 ml. Respirator solution for use in nebulizers: 5 mg (as sulfate)/ml. Tablet: 2 mg; 4 mg (as sulfate). * Oral salbutamol treatment should only be considered when inhaled asthma therapy is not feasible.

26. SOLUTIONS CORRECTING WATER, ELECTROLYTE AND ACID-BASE DISTURBANCES	
26.1 Oral	
oral rehydration salts	See section 17.5.1.
potassium chloride	Powder for solution.
26.2 Parenteral	
glucose	Injectable solution: 5% (isotonic); 10% (hypertonic); 50% (hypertonic).
glucose with sodium chloride	Injectable solution: 5% glucose, 0.9% sodium chloride (equivalent to 150 mmol/L Na ⁺ and 150 mmol/L Cl ⁻); 5% glucose, 0.45% sodium chloride (equivalent to 75 mmol/L Na ⁺ and 75 mmol/L Cl ⁻).
potassium chloride	Solution for dilution: 7.5% (equivalent to K 1 mmol/ml and Cl 1 mmol/ml); 15% (equivalent to K 2 mmol/ml and Cl 2 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). Solution: 8.4% in 10-ml ampoule (equivalent to Na ⁺ 1000 mmol/L, HCO ₃ ⁻ 1000 mmol/L).
□ sodium lactate, compound solution	Injectable solution.
26.3 Miscellaneous	
water for injection	2-ml; 5-ml; 10-ml ampoules.
27. VITAMINS AND MINERALS ^R	
^R The Subcommittee noted the need for a review of this section of the list to meet public health needs in children.	
ascorbic acid	Tablet: 50 mg.
cholecalciferol*	Oral liquid: 400 IU/ml. Solid oral dosage form: 400 IU; 1000 IU. * Ergocalciferol can be used as an alternative.
iodine	Capsule: 200 mg. 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.
pyridoxine	Tablet: 25 mg (hydrochloride).
retinol	Capsule: 100 000 IU; 200 000 IU (as palmitate). Oral oily solution: 100 000 IU (as palmitate)/ml in multidose dispenser. Tablet (sugar-coated): 10 000 IU (as palmitate). Water-miscible injection: 100 000 IU (as palmitate) in 2-ml ampoule.

riboflavin	Tablet: 5 mg.
sodium fluoride	In any appropriate topical formulation.
thiamine	Tablet: 50 mg (hydrochloride).
<i>Complementary List</i>	
<i>calcium gluconate</i>	Injection: 100 mg/ml in 10-ml ampoule.
28. EAR, NOSE AND THROAT CONDITIONS IN CHILDREN R	
R Review of role of leukotriene antagonists in the management of childhood allergic rhinitis.	
acetic acid	Topical: 2%, in alcohol.
☐ budesonide	Nasal spray: 100 micrograms per dose.
☐ ciprofloxacin	Topical: 0.3% drops.
☐ xylometazoline a	Nasal spray: 0.05%. a Not in children less than 3 months.
29. SPECIFIC MEDICINES FOR NEONATAL CARE	
caffeine citrate	Injection: 20 mg/ml (equivalent to 10 mg caffeine base/ml). Oral liquid: 20 mg/ml (equivalent to 10 mg caffeine base/ml).
<i>Complementary List</i>	
☐ ibuprofen	Solution for injection: 5 mg/ml.
☐ prostaglandin E	Solution for injection: Prostaglandin E1: 0.5 mg/ml in alcohol. Prostaglandin E2: 1 mg/ml.
surfactant	Suspension for intratracheal instillation: 25 mg/ml or 80 mg/ml.

Table 1: Medicines with age and weight restrictions

atazanavir	>25 kg
atropine	>3 months
benzyl benzoate	>2 years
betamethasone topical preparations	Hydrocortisone preferred in neonates
cefazolin	>1 month
ceftriaxone	>41 weeks corrected gestational age
chlorphenamine	>1 year
diloxanide	>25 kg
doxycycline	>8 years (except for serious infections e.g. cholera)
efavirenz	>3 years or >10 kg
emtricitabine	>3 months
fluoxetine	>8 years
ibuprofen	>3 months (except IV form for patent <i>ductus arteriosus</i>)
mefloquine	>5 kg or >3 months
metoclopramide	Not in neonates
ondansetron	>1 month
saquinavir	>25 kg
silver sulfadiazine	>2 months
tetracaine	Not in preterm neonates
trimethoprim	>6 months
xylometazoline	>3 months

Annex 1: Explanation of dosage forms

A. Principal dosage forms used in EMLc - Oral administration

Term	Definition
Solid oral dosage form	Refers to tablets or capsules or other solid dosage forms such as 'melts' that are immediate-release preparations. It implies that there is no difference in clinical efficacy or safety between the available dosage forms, and countries should therefore choose the form(s) to be listed depending on quality and availability. The term 'solid oral dosage form' is <i>never</i> intended to allow any type of modified-release tablet.
Tablet	Refers to: • uncoated or coated (film-coated or sugar-coated) tablets that are intended to be swallowed whole; • unscored and scored*; • tablets that are intended to be chewed before being swallowed; • tablets that are intended to be dispersed or dissolved in water or another suitable liquid before being swallowed; • tablets that are intended to be crushed before being swallowed. The term 'tablet' without qualification is <i>never</i> intended to allow any type of modified-release tablet.
Tablet (qualified)	Refers to a specific type of tablet: chewable - tablets that are intended to be chewed before being swallowed; dispersible - tablets that are intended to be dispersed in water or another suitable liquid before being swallowed; soluble - tablets that are intended to be dissolved in water or another suitable liquid before being swallowed; crushable - tablets that are intended to be crushed before being swallowed; scored - tablets bearing a break mark or marks where sub-division is intended in order to provide doses of less than one tablet; sublingual - tablets that are intended to be placed beneath the tongue. The term 'tablet' is <i>always</i> qualified with an additional term (in parentheses) in entries where one of the following types of tablet is intended: gastro-resistant (such tablets may sometimes be described as enteric-coated or as delayed-release), prolonged-release or another modified-release form.

* Scored tablets may be divided for ease of swallowing, provided dose is a whole number of tablets.

Term	Definition
Capsule	Refers to hard or soft capsules. The term 'capsule' without qualification is <i>never</i> intended to allow any type of modified-release capsule.
Capsule (qualified)	The term 'capsule' with qualification refers to gastro-resistant (such capsules may sometimes be described as enteric-coated or as delayed-release), prolonged-release or another modified-release form.
Granules	Preparations that are issued to patient as granules to be swallowed without further preparation, to be chewed, or to be taken in or with water or another suitable liquid. The term 'granules' without further qualification is <i>never</i> intended to allow any type of modified-release granules.
Oral powder	Preparations that are issued to patient as powder (usually as single-dose) to be taken in or with water or another suitable liquid.
Oral liquid	Liquid preparations intended to be <i>swallowed</i> i.e. oral solutions, suspensions, emulsions and oral drops, including those constituted from powders or granules, but <i>not</i> those preparations intended for <i>oromucosal administration</i> e.g. gargles and mouthwashes. Oral liquids presented as powders or granules may offer benefits in the form of better stability and lower transport costs. If more than one type of oral liquid is available on the same market (e.g. solution, suspension, granules for reconstitution), they may be interchanged and in such cases should be bioequivalent. It is preferable that oral liquids do not contain sugar and that solutions for children do not contain alcohol.

B. Principal dosage forms used in EMLc - Parenteral administration

Term	Definition
Injection	Refers to solutions, suspensions and emulsions including those constituted from powders or concentrated solutions.
Injection (qualified)	Route of administration is indicated in parentheses where relevant.
Injection (oily)	The term injection is qualified by (oily) in relevant entries.
Intravenous infusion	Refers to solutions and emulsions including those constituted from powders or concentrated solutions.

C. Other dosage forms

Mode of administration	Term to be used
To the eye	Eye drops, eye ointments.
Topical	For liquids: lotions, paints. For semi-solids: cream, ointment.
Rectal	Suppositories, gel or solution.
Vaginal	Pessaries or vaginal tablets.
Inhalation	Powder for inhalation, pressurized inhalation, nebulizer.

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<i>asparaginase</i>	15	dapsone	8
atazanavir	11	<i>daunorubicin</i>	15
atropine.....	3, 4, 24	deferoxamine	5
<i>azathioprine</i>	15	dexamethasone.....	4, 16, 20
azithromycin	7	diazepam.....	3, 5, 16
<i>barium sulfate</i>	19	didanosine (ddI).....	10
BCG vaccine.....	23	<i>diethylcarbamazine</i>	6
benzathine benzylpenicillin.....	6	digoxin.....	18
benznidazole	14	diloxanide.....	12
benzoic acid + salicylic acid	18	dimercaprol.....	5
benzoyl peroxide.....	19	diphtheria antitoxin	23
benzyl benzoate	19	diphtheria vaccine.....	23
benzylpenicillin	6	docusate sodium	16
betamethasone	19	<i>dopamine</i>	18
<i>bleomycin</i>	15	<i>doxorubicin</i>	15
budesonide.....	25, 27	doxycycline	8, 13, 14
bupivacaine	3	efavirenz (EFV or EFZ).....	11
caffeine citrate.....	27	eflornithine.....	14
calamine lotion	19	emtricitabine (FTC)	10
<i>calcium folinate</i>	15	enalapril.....	18
calcium gluconate	4, 27	epinephrine (adrenaline).....	4, 24, 25
<i>capreomycin</i>	9	erythromycin	8
carbamazepine.....	5	ethambutol	9
cefalexin.....	6	ethanol	19
cefazolin.....	6	<i>ethionamide</i>	9
<i>cefotaxime</i>	7	<i>ethosuximide</i>	5
<i>ceftazidime</i>	7	<i>etoposide</i>	15
ceftriaxone	7	<i>factor IX complex (coagulation factors,</i> <i>II, VII, IX, X) concentrate</i>	17
charcoal, activated.....	4	<i>factor VIII concentrate</i>	17
<i>chlorambucil</i>	15	ferrous salt.....	17
chloramphenicol.....	7		

fluconazole	9	meningococcal meningitis vaccine	23
flucytosine	10	mercaptopurine	16
fludrocortisone	21	metformin	22
fluorescein	19	methotrexate.....	16
fluorouracil.....	16	methylrosanilinium chloride (gentian violet) 18	
fluoxetine	25	metoclopramide	21
folic acid	17	metronidazole.....	8, 12
furosemide	18, 20	miconazole	18
gentamicin.....	8, 24	midazolam	16
glucose	26	morphine.....	3, 4, 17
glucose with sodium chloride	26	mumps vaccine.....	23
glutaral.....	20	naloxone	5
griseofulvin	9	neomycin sulfate + bacitracin	18
<i>Haemophilus influenzae</i> type b vaccine.....	23	neostigmine.....	24
haloperidol.....	25	nevirapine (NVP)	11
halothane.....	3	niclosamide	6
heparin sodium.....	17	nifurtimox	15
hepatitis A vaccine	23	nitrofurantoin	8
hepatitis B vaccine.....	23	nitrous oxide	3
human normal immunoglobulin	18	nystatin	10
hydrochlorothiazide	20	ofloxacin.....	9
hydrocortisone.....	4, 16, 19, 21	omeprazole.....	20
hydroxocobalamin	17	ondansetron	21
hyoscine hydrobromide	16	oral rehydration salts.....	21, 26
ibuprofen.....	3, 15, 16, 27	oseltamivir	12
imipenem + cilastatin.....	7	oxamniquine	6
influenza vaccine.....	23	oxygen	3
insulin injection (soluble)	22	<i>p</i> -aminosalicylic acid.....	9
intermediate-acting insulin.....	22	pancreatic enzymes	20
intraperitoneal dialysis solution (of appropriate composition).....	25	paracetamol.....	3, 15
iodine	26	paromomycin.....	12
isoniazid	9	penicillamine	5
ivermectin.....	6	pentamidine.....	14
Japanese encephalitis vaccine	23	permethrin	19
kanamycin	9	pertussis vaccine	23
ketamine	3	phenobarbital.....	5
lamivudine (3TC)	10	phenoxymethylpenicillin	7
lamivudine + nevirapine + stavudine	11	phenytoin	5
lamivudine + nevirapine + zidovudine	11	phytomenadione	17
lamivudine + zidovudine	11	pneumococcal vaccine.....	23
levamisole.....	6	podophyllum resin	19
levothyroxine	22	poliomyelitis vaccine	23
lidocaine	3	polyvidone iodine	19
lidocaine + epinephrine (adrenaline).....	3	potassium chloride.....	26
lopinavir + ritonavir (LPV/r).....	11	<i>potassium iodide</i>	10, 22
lorazepam.....	5	potassium permanganate.....	19
<i>Lugol's solution</i>	22	praziquantel.....	6
magnesium hydroxide.....	20	prednisolone	4, 16, 24
mannitol.....	20	primaquine.....	13
measles vaccine	23	procaine benzylpenicillin.....	7
mebendazole.....	6	<i>procarbazine</i>	16
mefloquine	13, 14	proguanil.....	14
melarsoprol	14	propranolol	15
		<i>propylthiouracil</i>	22

<i>prostaglandin E</i>	27	<i>stavudine (d4T)</i>	11
<i>protamine sulfate</i>	17	<i>streptomycin</i>	9
<i>pyrantel</i>	6	<i>sulfadiazine</i>	14
<i>pyrazinamide</i>	9	<i>sulfadoxine + pyrimethamine</i>	14
<i>pyridostigmine</i>	24	<i>sulfamethoxazole + trimethoprim</i>	8, 14
<i>pyridoxine</i>	26	<i>suramin sodium</i>	14
<i>pyrimethamine</i>	14	<i>surfactant</i>	27
<i>quinine</i>	13	<i>suxamethonium</i>	24
<i>rabies immunoglobulin</i>	23	<i>tetanus vaccine</i>	23
<i>rabies vaccine</i>	23	<i>tetracaine</i>	24
<i>ranitidine</i>	20	<i>tetracycline</i>	24
<i>retinol</i>	26	<i>thiamine</i>	27
<i>ribavirin</i>	12	<i>thiopental</i>	3
<i>riboflavin</i>	27	<i>triclabendazole</i>	6
<i>rifampicin</i>	8, 9	<i>trimethoprim</i>	8
<i>ritonavir</i>	11	<i>tropicamide</i>	19
<i>rotavirus vaccine</i>	23	<i>tuberculin, purified protein</i> <i>derivative (PPD)</i>	22
<i>rubella vaccine</i>	23	<i>typhoid vaccine</i>	23
<i>salbutamol</i>	25	<i>urea</i>	19
<i>salicylic acid</i>	19	<i>valproic acid (sodium valproate)</i>	5
<i>saquinavir (SQV)</i>	11	<i>vancomycin</i>	8
<i>selenium sulfide</i>	18	<i>varicella vaccine</i>	23
<i>senna</i>	17	<i>vecuronium</i>	24
<i>silver sulfadiazine</i>	19	<i>vinblastine</i>	16
<i>sodium calcium edetate</i>	5	<i>vincristine</i>	16
<i>sodium chloride</i>	26	<i>warfarin</i>	17
<i>sodium fluoride</i>	27	<i>water for injection</i>	26
<i>sodium hydrogen carbonate</i>	26	<i>xylometazoline</i>	27
<i>sodium lactate, compound solution</i>	26	<i>yellow fever vaccine</i>	23
<i>sodium stibogluconate or meglumine</i> <i>antimoniate</i>	12	<i>zidovudine (ZDV or AZT)</i>	11
<i>spironolactone</i>	20	<i>zinc sulfate</i>	21