

World Health Organization Model List of Essential Medicines for Children

8th List
(2021)



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Explanatory notes

This Model List is intended for use for children up to and including 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 intended to indicate therapeutic alternatives to the listed medicine that may be considered for selection in national essential medicines lists. Alternatives may be individual medicines, or multiple medicines within a pharmacological class or chemical subgroup, defined at the 4th level of the [Anatomical Therapeutic Chemical \(ATC\) classification](#), which have similar clinical effectiveness and safety. The listed medicine should be the example of the class or subgroup 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. A square box is not used to indicate alternative generic brands of the same small molecule medicines, nor alternative biosimilars of biological medicines. However, the selection and use of quality-assured generics and biosimilars of essential medicines at country level is recommended.

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 22nd WHO Model List of Essential Medicines is used for the 8th WHO Model Essential List for Children. Some sections have been deleted because they contain medicines that are not relevant for children.

The **Ⓜ** symbol indicates that there is an age or weight restriction on use of the medicine; details for each medicine are in Table 1.1 of Annex 1.

The presence of an entry on the Essential Medicines List for Children 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 website <https://www.who.int/teams/health-product-and-policy-standards/standards-and-specifications/norms-and-standards-for-pharmaceuticals/guidelines/quality-assurance>.

Medicines and dosage forms are listed in alphabetical order within each section and the order of listing does not imply 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 Table 1.2 of 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*
<https://www.who.int/teams/health-product-and-policy-standards/standards-and-specifications/norms-and-standards-for-pharmaceuticals/pharmacopoeia>.

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1. ANAESTHETICS, PREOPERATIVE MEDICINES AND MEDICAL GASES	
1.1 General anaesthetics and oxygen	
1.1.1 Inhalational medicines	
halothane	Inhalation.
isoflurane	Inhalation.
nitrous oxide	Inhalation.
oxygen	Inhalation (medical gas).
1.1.2 Injectable medicines	
ketamine	Injection: 50 mg/mL (as hydrochloride) in 10 mL vial.
<input type="checkbox"/> propofol * Therapeutic alternatives: - thiopental	Injection: 10 mg/mL; 20 mg/mL.
1.2 Local anaesthetics	
<input type="checkbox"/> bupivacaine Therapeutic alternatives to be reviewed (2023)	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.
<input type="checkbox"/> lidocaine Therapeutic alternatives to be reviewed (2023)	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 or sulfate) + epinephrine 1:200 000 in vial.
1.3 Preoperative medication and sedation for short-term procedures	
atropine	Injection: 1 mg (sulfate) in 1 mL ampoule.
<input type="checkbox"/> midazolam Therapeutic alternatives to be reviewed (2023)	Injection: 1 mg/mL. Oral liquid: 2 mg/mL. Tablet: 7.5 mg; 15 mg.
morphine	Injection: 10 mg (sulfate or hydrochloride) in 1 mL ampoule.
1.4 Medical gases	
oxygen*	Inhalation For use in the management of hypoxaemia. *No more than 30% oxygen should be used to initiate resuscitation of neonates less than or equal to 32 weeks of gestation.

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2. MEDICINES FOR PAIN AND PALLIATIVE CARE	
2.1 Non-opioids and non-steroidal anti-inflammatory medicines (NSAIDs)	
ibuprofen <input type="checkbox"/>	<p>Oral liquid: 200 mg/5 mL.</p> <p>Tablet: 200 mg; 400 mg; 600 mg.</p> <p><input type="checkbox"/> Not in children less than 3 months.</p>
paracetamol*	<p>Oral liquid: 120 mg/5 mL; 125 mg/5 mL.</p> <p>Suppository: 100 mg.</p> <p>Tablet: 100 mg to 500 mg.</p> <p>*Not recommended for anti-inflammatory use due to lack of proven benefit to that effect.</p>
2.2 Opioid analgesics	
<input type="checkbox"/> morphine Therapeutic alternatives: - hydromorphone - oxycodone	<p>Granules (slow release; to mix with water): 20 mg to 200 mg (morphine sulfate).</p> <p>Injection: 10 mg (morphine hydrochloride or morphine sulfate) in 1 mL ampoule.</p> <p>Oral liquid: 10 mg/5 mL (morphine hydrochloride or morphine sulfate).</p> <p>Tablet (slow release): 10 mg to 200mg (morphine hydrochloride or morphine sulfate).</p> <p>Tablet (immediate release): 10 mg (morphine sulfate).</p>
<i>Complementary list</i>	
methadone*	<p>Tablet: 5 mg; 10 mg (hydrochloride).</p> <p>Oral liquid: 5 mg/5 mL; 10 mg/5 mL (hydrochloride).</p> <p>Concentrate for oral liquid: 5 mg/mL; 10 mg/mL (hydrochloride)</p> <p>*For the management of cancer pain.</p>
2.3 Medicines for other symptoms common in palliative care	
amitriptyline	Tablet: 10 mg; 25 mg.
cyclizine	<p>Injection: 50 mg/mL.</p> <p>Tablet: 50 mg.</p>
dexamethasone	<p>Injection: 4 mg/mL (as disodium phosphate salt) in 1 mL ampoule.</p> <p>Oral liquid: 2 mg/5 mL.</p> <p>Tablet: 2 mg.</p>
diazepam	<p>Injection: 5 mg/mL.</p> <p>Oral liquid: 2 mg/5 mL.</p> <p>Rectal solution: 2.5 mg; 5 mg; 10 mg.</p> <p>Tablet: 5 mg; 10 mg.</p>

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docusate sodium	Capsule: 100 mg. Oral liquid: 50 mg/5 mL.
fluoxetine ^a	Solid oral dosage form: 20 mg (as hydrochloride). ^a > 8 years.
hyoscine hydrobromide	Injection: 400 micrograms/mL; 600 micrograms/mL. Transdermal patches: 1 mg/72 hours.
lactulose	Oral liquid: 3.1 to 3.7 g/5 mL.
midazolam	Injection: 1 mg/mL; 5 mg/mL. Oral liquid: 2mg/mL. Solid oral dosage form: 7.5 mg; 15 mg.
<input type="checkbox"/> ondansetron ^a Therapeutic alternatives - dolasetron - granisetron - palonosetron - tropisetron	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.
senna	Oral liquid: 7.5 mg/5 mL.
3. ANTIALLERGICS AND MEDICINES USED IN ANAPHYLAXIS	
dexamethasone	Injection: 4 mg/mL (as disodium phosphate salt) in 1 mL ampoule.
epinephrine (adrenaline)	Injection: 1 mg/mL (as hydrochloride or hydrogen tartrate) in 1 mL ampoule.
hydrocortisone	Powder for injection: 100 mg (as sodium succinate) in vial.
<input type="checkbox"/> loratadine* Therapeutic alternatives: - cetirizine - fexofenadine	Oral liquid: 1 mg/mL. Tablet: 10 mg. <i>*There may be a role for sedating antihistamines for limited indications.</i>
<input type="checkbox"/> prednisolone Therapeutic alternatives: - prednisone	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%; 20%.
atropine	Injection: 1 mg (sulfate) in 1 mL ampoule.
calcium gluconate	Injection: 100 mg/mL in 10 mL ampoule.
naloxone	Injection: 400 micrograms (hydrochloride) in 1 mL ampoule.
Complementary List	
deferoxamine	Powder for injection: 500 mg (mesilate) in vial.

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<i>dimercaprol</i>	Injection in oil: 50 mg/mL in 2 mL ampoule.
<i>fomepizole</i>	Injection: 5 mg/mL (sulfate) in 20 mL ampoule or 1 g/mL (base) in 1.5 mL ampoule.
<i>sodium calcium edetate</i>	Injection: 200 mg/mL in 5 mL ampoule.
<i>succimer</i>	Solid oral dosage form: 100 mg.
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; 4 mL tubes.
lamotrigine*	Tablet: 25 mg; 50 mg; 100 mg; 200 mg. Tablet (chewable, dispersible): 2 mg; 5 mg; 25 mg; 50 mg; 100 mg; 200 mg. *For use as adjunctive therapy for treatment-resistant partial or generalized seizures.
<input type="checkbox"/> lorazepam Therapeutic alternatives: - diazepam (injection) - midazolam (injection)	Injection: 2 mg/mL in 1 mL ampoule; 4 mg/mL in 1 mL ampoule.
midazolam	Solution for oromucosal administration: 5 mg/mL; 10 mg/mL Ampoule*: 1 mg/mL; 10 mg/mL *For buccal administration when solution for oromucosal administration is not available
phenobarbital	Injection: 200 mg/mL (sodium). Oral liquid: 15 mg/5 mL. Tablet: 15 mg to 100 mg.
phenytoin	Injection: 50 mg/mL (sodium) in 5 mL vial. Oral liquid: 25 mg to 30 mg/5 mL.* Solid oral dosage form: 25 mg; 50 mg; 100 mg (sodium). 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)* *avoid use in pregnancy and in women and girls of child-bearing potential, unless alternative treatments are ineffective or not tolerated because of the high risk of birth defects and developmental disorders in children exposed to valproate in the womb.	Oral liquid: 200 mg/5 mL. Tablet (crushable): 100 mg. Tablet (enteric-coated): 200 mg; 500 mg.

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<i>Complementary List</i>	
<i>ethosuximide</i>	<i>Capsule: 250 mg. Oral liquid: 250 mg/5 mL.</i>
<i>valproic acid (sodium valproate)* *avoid use in pregnancy and in women and girls of child-bearing potential, unless alternative treatments are ineffective or not tolerated because of the high risk of birth defects and developmental disorders in children exposed to valproate in the womb.</i>	<i>Injection: 100 mg/mL in 4 mL ampoule; 100 mg/mL in 10 mL ampoule.</i>
6. ANTI-INFECTIVE MEDICINES	
6.1 Anthelmintics	
6.1.1 Intestinal anthelmintics	
<i>albendazole</i>	<i>Tablet (chewable): 400 mg.</i>
<i>ivermectin</i>	<i>Tablet (scored): 3 mg.</i>
<i>levamisole</i>	<i>Tablet: 50 mg; 150 mg (as hydrochloride).</i>
<i>mebendazole</i>	<i>Tablet (chewable): 100 mg; 500 mg.</i>
<i>niclosamide</i>	<i>Tablet (chewable): 500 mg.</i>
<i>praziquantel</i>	<i>Tablet: 150 mg; 600 mg.</i>
<i>pyrantel</i>	<i>Oral liquid: 50 mg (as embonate or pamoate)/mL. Tablet (chewable): 250 mg (as embonate or pamoate).</i>
6.1.2 Antifilarials	
<i>albendazole</i>	<i>Tablet (chewable): 400 mg.</i>
<i>diethylcarbamazine</i>	<i>Tablet: 50 mg; 100 mg (dihydrogen citrate).</i>
<i>ivermectin</i>	<i>Tablet (scored): 3 mg.</i>
6.1.3 Antischistosomal and other antitremitode medicines	
<i>praziquantel</i>	<i>Tablet: 600 mg.</i>
<i>triclabendazole</i>	<i>Tablet: 250 mg.</i>
<i>Complementary List</i>	
<i>oxamniquine*</i>	<i>Capsule: 250 mg. Oral liquid: 250 mg/5 mL. *For use when praziquantel treatment fails.</i>
6.1.4 Cysticidal medicines	
<i>Complementary List</i>	
<i>albendazole</i>	<i>Tablet (chewable): 400 mg.</i>
<i>mebendazole</i>	<i>Tablet (chewable): 500 mg.</i>
<i>praziquantel</i>	<i>Tablet: 500 mg; 600 mg</i>

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6.2 Antibacterials

To assist in the development of tools for antibiotic stewardship at local, national and global levels and to reduce antimicrobial resistance, the Access, Watch, Reserve (AWaRe) classification of antibiotics has been developed by WHO – where antibiotics are classified into different groups to emphasize the importance of their appropriate use.

ACCESS GROUP ANTIBIOTICS

This group includes antibiotics that have activity against a wide range of commonly encountered susceptible pathogens while also showing lower resistance potential than antibiotics in the other groups. Selected Access group antibiotics are recommended as essential first or second choice empiric treatment options for infectious syndromes reviewed by the EML Expert Committee and are listed as individual medicines on the Model Lists to improve access and promote appropriate use. They are essential antibiotics that should be widely available, affordable and quality assured.

WATCH GROUP ANTIBIOTICS

This group includes antibiotic classes that have higher resistance potential and includes most of the highest priority agents among the [Critically Important Antimicrobials for Human Medicine](#) and/or antibiotics that are at relatively high risk of selection of bacterial resistance. These medicines should be prioritized as key targets of stewardship programs and monitoring. Selected Watch group antibiotics are recommended as essential first or second choice empiric treatment options for a limited number of specific infectious syndromes and are listed as individual medicines on the Model Lists.

RESERVE GROUP ANTIBIOTICS

This group includes antibiotics and antibiotic classes that should be reserved for treatment of confirmed or suspected infections due to multi-drug-resistant organisms. Reserve group antibiotics should be treated as “last resort” options. Selected Reserve group antibiotics are listed as individual medicines on the Model Lists when they have a favourable risk-benefit profile and proven activity against “Critical Priority” or “High Priority” pathogens identified by the [WHO Priority Pathogens List](#), notably carbapenem resistant *Enterobacteriaceae*. These antibiotics should be accessible, but their use should be tailored to highly specific patients and settings, when all alternatives have failed or are not suitable. These medicines could be protected and prioritized as key targets of national and international stewardship programs involving monitoring and utilization reporting, to preserve their effectiveness.

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6.2.1 Access group antibiotics		
amikacin	Injection: 250 mg/mL (as sulfate) in 2 mL vial.	
	FIRST CHOICE – High-risk febrile neutropenia-pyelonephritis (severe)	SECOND CHOICE – Sepsis in neonates and children
amoxicillin	Powder for injection: 250 mg; 500 mg; 1 g (as sodium) in vial. Powder for oral liquid: 125 mg/5 mL; 250 mg/5 mL (as trihydrate). Solid oral dosage form: 250 mg; 500 mg (as trihydrate).	
	FIRST CHOICE – Community acquired pneumonia (mild to moderate) – Community acquired pneumonia (severe) – Complicated severe acute malnutrition – Otitis media – Pharyngitis – Progressive apical dental abscess – Sepsis in neonates and children – Sinusitis – Uncomplicated severe acute malnutrition	SECOND CHOICE – Acute bacterial meningitis
amoxicillin + clavulanic acid	Powder for injection: 500 mg (as sodium) + 100 mg (as potassium salt); 1000 mg (as sodium) + 200 mg (as potassium salt) in vial. Powder for oral liquid: 125 mg (as trihydrate)+ 31.25 mg (as potassium salt)/5 mL; 250 mg (as trihydrate) + 62.5 mg (as potassium salt)/5mL. Tablet: 500 mg (as trihydrate) + 125 mg (as potassium salt).	
	FIRST CHOICE – Community acquired pneumonia (severe) – Complicated intraabdominal infections (mild to moderate) – Hospital acquired pneumonia – Low-risk febrile neutropenia – Lower urinary tract infections – Sinusitis – Skin and soft tissue infections	SECOND CHOICE – Bone and joint infections – Community acquired pneumonia (mild to moderate) – Community acquired pneumonia (severe) – Otitis media – Surgical prophylaxis
ampicillin	Powder for injection: 500 mg; 1 g (as sodium) in vial.	
	FIRST CHOICE – Community acquired pneumonia (severe) – Complicated intraabdominal infections – Complicated severe acute malnutrition – Sepsis in neonates and children	SECOND CHOICE – Acute bacterial meningitis

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benzathine benzylpenicillin	Powder for injection: 1.2 million IU (\approx 900 mg) in vial; 2.4 million IU (\approx 1.8 g) in vial.	
	FIRST CHOICE – <i>Syphilis (congenital)</i>	SECOND CHOICE
benzylpenicillin	Powder for injection: 600 mg (= 1 million IU); 3 g (= 5 million IU) (sodium or potassium salt) in vial.	
	FIRST CHOICE – <i>Community acquired pneumonia (severe)</i> – <i>Complicated severe acute malnutrition</i> – <i>Sepsis in neonates and children</i> – <i>Syphilis (congenital)</i>	SECOND CHOICE – <i>Acute bacterial meningitis</i>
cefalexin	Powder for oral liquid: 125 mg/5 mL; 250 mg/5 mL (anhydrous). Solid oral dosage form: 250 mg (as monohydrate).	
	FIRST CHOICE – <i>Skin and soft tissue infections</i>	SECOND CHOICE – <i>Pharyngitis</i>
cefazolin ^a	Powder for injection: 1 g (as sodium salt) in vial. ^a > 1 month.	
	FIRST CHOICE – <i>Surgical prophylaxis</i>	SECOND CHOICE – <i>Bone and joint infections</i>
chloramphenicol	Capsule: 250 mg. Oily suspension for injection*: 0.5 g/mL (as sodium succinate) in 2 mL ampoule. *Only for the presumptive treatment of epidemic meningitis in children older than 2 years. Oral liquid: 150 mg/5 mL (as palmitate). Powder for injection: 1 g (sodium succinate) in vial.	
	FIRST CHOICE	SECOND CHOICE – <i>Acute bacterial meningitis</i>
clindamycin	Capsule: 150 mg (as hydrochloride). Injection: 150 mg/mL (as phosphate). Oral liquid: 75 mg/5 mL (as palmitate).	
	FIRST CHOICE – <i>Necrotizing fasciitis</i>	SECOND CHOICE – <i>Bone and joint infections</i>

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<p><input type="checkbox"/> cloxacillin*</p> <p>Therapeutic alternatives: - 4th level ATC chemical subgroup (J01CF Beta-lactamase resistant penicillins)</p>	<p>Capsule: 500 mg; 1 g (as sodium).</p> <p>Powder for injection: 500 mg (as sodium) in vial.</p> <p>Powder for oral liquid: 125 mg/5 mL (as sodium).</p> <p>*cloxacillin, dicloxacillin and flucloxacillin are preferred for oral administration due to better bioavailability.</p>	
<p>doxycycline <input type="checkbox"/></p>	<p>FIRST CHOICE</p> <ul style="list-style-type: none"> – Bone and joint infections – Skin and soft tissue infections 	<p>SECOND CHOICE</p> <ul style="list-style-type: none"> – Sepsis in neonates and children
<p>gentamicin</p>	<p>Injection: 10 mg/mL (as sulfate); 40 mg/mL (as sulfate) in 2 mL vial.</p>	
<p>metronidazole</p>	<p>FIRST CHOICE</p> <ul style="list-style-type: none"> – <i>C. difficile</i> infection – Complicated intra-abdominal infections (mild to moderate) – Complicated intra-abdominal infections (severe) – Necrotizing fasciitis – Surgical prophylaxis 	<p>SECOND CHOICE</p> <ul style="list-style-type: none"> – Complicated intra-abdominal infections (mild to moderate)
<p>nitrofurantoin</p>	<p>Oral liquid: 25 mg/5 mL.</p> <p>Tablet: 100 mg.</p>	
	<p>FIRST CHOICE</p> <ul style="list-style-type: none"> – Lower urinary tract infections 	<p>SECOND CHOICE</p>

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phenoxymethylpenicillin	Powder for oral liquid: 250 mg/5 mL (as potassium). Tablet: 250 mg (as potassium).	
	FIRST CHOICE – <i>Community acquired pneumonia (mild to moderate)</i> – <i>Pharyngitis</i> – <i>Progressive apical dental abscess</i>	SECOND CHOICE
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 / sepsis except in settings with high neonatal mortality, when given by trained health workers in cases where hospital care is not achievable.	
	FIRST CHOICE – <i>Syphilis (congenital)</i>	SECOND CHOICE
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.	
	FIRST CHOICE – <i>Lower urinary tract infections</i>	SECOND CHOICE – <i>Acute invasive bacterial diarrhoea / dysentery</i>
trimethoprim	Tablet: 100 mg; 200 mg. Oral liquid: 50 mg/5 mL.	
	FIRST CHOICE – <i>Lower urinary tract infections</i>	SECOND CHOICE
6.2.2 Watch group antibiotics		
azithromycin	Capsule: 250 mg; 500 mg (anhydrous). Oral liquid: 200 mg/5 mL.	
	FIRST CHOICE – <i>Cholera</i> – <i>Enteric fever</i> – <i>Trachoma</i> – <i>Yaws</i>	SECOND CHOICE – <i>Acute invasive bacterial diarrhoea / dysentery</i>
cefixime	Powder for oral liquid: 100 mg/5 mL. Solid oral dosage form: 200 mg; 400 mg (as trihydrate).	
	FIRST CHOICE	SECOND CHOICE – <i>Acute invasive bacterial diarrhoea / dysentery</i>

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cefotaxime*	<p>Powder for injection: 250 mg (as sodium) in vial.</p> <p>*3rd generation cephalosporin of choice for use in hospitalized neonates.</p>	
	<p>FIRST CHOICE</p> <ul style="list-style-type: none"> – Acute bacterial meningitis – Community acquired pneumonia (severe) – Complicated intraabdominal infections (mild to moderate) – Complicated intraabdominal infections (severe) – Hospital acquired pneumonia – Pyelonephritis (severe) 	<p>SECOND CHOICE</p> <ul style="list-style-type: none"> – Bone and joint infections – Pyelonephritis (mild to moderate) – Sepsis in neonates and children
ceftriaxone* ^a	<p>Powder for injection: 250 mg; 1 g (as sodium) in vial.</p> <p>*Do not administer with calcium and avoid in infants with hyperbilirubinaemia.</p> <p>^a > 41 weeks corrected gestational age.</p>	
	<p>FIRST CHOICE</p> <ul style="list-style-type: none"> – Acute bacterial meningitis – Community acquired pneumonia (severe) – Complicated intraabdominal infections (mild to moderate) – Complicated intraabdominal infections (severe) – Endophthalmitis – Enteric fever – Hospital acquired pneumonia – Necrotizing fasciitis – Pyelonephritis (severe) 	<p>SECOND CHOICE</p> <ul style="list-style-type: none"> – Acute invasive bacterial diarrhoea / dysentery – Bone and joint infections – Pyelonephritis or prostatitis (mild to moderate) – Sepsis in neonates and children
cefuroxime	<p>Powder for injection: 250 mg; 750 mg; 1.5 g (as sodium) in vial.</p>	
	<p>FIRST CHOICE</p>	<p>SECOND CHOICE</p> <ul style="list-style-type: none"> – Surgical prophylaxis
ciprofloxacin	<p>Oral liquid: 250 mg/5 mL (anhydrous) .</p> <p>Solution for IV infusion: 2 mg/ mL (as hyclate) .</p> <p>Solid oral dosage form: 250 mg (as hydrochloride).</p>	
	<p>FIRST CHOICE</p> <ul style="list-style-type: none"> – Acute invasive bacterial diarrhoea / dysentery – Enteric fever – Low-risk febrile neutropenia – Pyelonephritis (mild to moderate) 	<p>SECOND CHOICE</p> <ul style="list-style-type: none"> – Cholera – Complicated intraabdominal infections (mild to moderate)

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<input type="checkbox"/> clarithromycin Therapeutic alternatives: - erythromycin	Powder for oral liquid: 125 mg/5 mL; 250 mg/5 mL. Powder for injection: 500 mg in vial. Solid oral dosage form: 500 mg.	
	FIRST CHOICE	SECOND CHOICE – <i>Pharyngitis</i>
piperacillin + tazobactam	Powder for injection: 2 g (as sodium) + 250 mg (as sodium); 4 g (as sodium) + 500 mg (as sodium) in vial.	
	FIRST CHOICE – <i>Complicated intraabdominal infections (severe)</i> – <i>High-risk febrile neutropenia</i> – <i>Hospital acquired pneumonia</i> – <i>Necrotizing fasciitis</i>	SECOND CHOICE
vancomycin	Capsule: 125 mg; 250 mg (as hydrochloride).	
	FIRST CHOICE	SECOND CHOICE – <i>C. difficile infection</i>
Complementary List		
ceftazidime	Powder for injection: 250 mg; 1 g (as pentahydrate) in vial.	
	FIRST CHOICE – <i>Endophthalmitis</i>	SECOND CHOICE
<input type="checkbox"/> meropenem* <input type="checkbox"/> a Therapeutic alternatives*: - imipenem + cilastatin * <i>complicated intraabdominal infections and high-risk febrile neutropenia only. Meropenem is the preferred choice for acute bacterial meningitis in neonates.</i>	Powder for injection: 500 mg (as trihydrate); 1 g (as trihydrate) in vial <input type="checkbox"/> a > 3 months.	
	FIRST CHOICE	SECOND CHOICE – <i>Acute bacterial meningitis in neonates</i> – <i>Complicated intraabdominal infections (severe)</i> – <i>High-risk febrile neutropenia</i>
vancomycin	Powder for injection: 250 mg (as hydrochloride) in vial.	
	FIRST CHOICE – <i>Endophthalmitis</i> – <i>Necrotizing fasciitis</i>	SECOND CHOICE – <i>High-risk febrile neutropenia</i>

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6.2.3 Reserve group antibiotics	
Complementary List	
<i>ceftazidime + avibactam</i>	Powder for injection: 2 g + 0.5 g in vial
<i>colistin</i>	Powder for injection: 1 million IU (as colistemetate sodium) in vial
<i>fosfomycin</i>	Powder for injection: 2 g; 4 g (as sodium) in vial
<i>linezolid</i>	Injection for intravenous administration: 2 mg/mL in 300 mL bag. Powder for oral liquid: 100 mg/5 mL. Tablet: 400 mg; 600 mg.
<i>polymyxin B</i>	Powder for injection: 500,000 IU in vial
6.2.4 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.
6.2.5 Antituberculosis medicines	
WHO 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). Tablet (dispersible): 100 mg.
isoniazid	Oral liquid: 50 mg/5 mL. Tablet: 100 mg; 300 mg. Tablet (dispersible): 100 mg.
isoniazid + pyrazinamide + rifampicin	Tablet (dispersible): 50 mg + 150 mg + 75 mg.
isoniazid + rifampicin	Tablet (dispersible): 50 mg + 75 mg.
isoniazid + rifapentine	Tablet (scored): 300 mg + 300 mg.
pyrazinamide	Oral liquid: 30 mg/mL. Tablet: 400 mg; 500 mg. Tablet (dispersible): 150 mg.
rifampicin	Oral liquid: 20 mg/mL. Solid oral dosage form: 150 mg; 300 mg.
rifapentine	Tablet: 150 mg; 300 mg.

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Complementary List	
<i>Medicines for the treatment of multidrug-resistant tuberculosis (MDR-TB) should be used in specialized centres adhering to WHO standards for TB control.</i>	
amikacin	Injection: 100 mg/2 mL (as sulfate) in 2 mL vial; 250 mg/mL (as sulfate) in 2 mL vial.
amoxicillin + clavulanic acid*	Powder for oral liquid: 250 mg (as trihydrate) + 62.5 mg (as potassium salt)/5mL. Tablet: 500 mg (as trihydrate) + 125 mg (as potassium salt). *For use only in combination with meropenem.
bedaquiline ^a	Tablet: 20 mg; 100 mg. ^a ≥ 5 years
clofazimine	Solid oral dosage form: 50 mg; 100 mg.
cycloserine	Solid oral dosage form: 125 mg; 250 mg.
delamanid ^a	Tablet (dispersible): 25 mg. ^a ≥ 3 years Tablet: 50 mg. ^a ≥ 6 years
<input type="checkbox"/> ethionamide Therapeutic alternatives: - protionamide	Tablet: 125 mg; 250 mg. Tablet (dispersible): 125 mg.
levofloxacin	Tablet: 250 mg; 500 mg. Tablet (dispersible): 100 mg.
linezolid	Powder for oral liquid: 100 mg/5 mL. Tablet: 600 mg. Tablet (dispersible): 150 mg.
meropenem	Powder for injection: 500 mg (as trihydrate); 1 g (as trihydrate) in vial.
moxifloxacin	Tablet: 400 mg. Tablet (dispersible): 100 mg.
p-aminosalicylic acid	Granules: 4 g in sachet.
streptomycin	Powder for injection: 1 g (as sulfate) in vial.
6.3 Antifungal medicines	
amphotericin B	Powder for injection: 50 mg in vial (as sodium deoxycholate or liposomal complex).
fluconazole	Capsule: 50 mg. Injection: 2 mg/mL in vial. Oral liquid: 50 mg/5 mL.
flucytosine	Capsule: 250 mg. Infusion: 2.5 g in 250 mL.
griseofulvin	Oral liquid: 125 mg/5 mL. Solid oral dosage form: 125 mg; 250 mg.

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itraconazole*	<p>Capsule: 100 mg.</p> <p>Oral liquid: 10 mg/mL.</p> <p>*For treatment of chronic pulmonary aspergillosis, acute invasive aspergillosis, histoplasmosis, sporotrichosis, paracoccidioidomycosis, mycoses caused by <i>T. marneffe</i> and chromoblastomycosis; and prophylaxis of histoplasmosis and infections caused by <i>T. marneffe</i> in AIDS patients.</p>
nystatin	<p>Lozenge: 100 000 IU.</p> <p>Oral liquid: 50 mg/5 mL; 100 000 IU/mL.</p> <p>Tablet: 100 000 IU; 500 000 IU.</p>
voriconazole*	<p>Tablet: 50 mg; 200 mg.</p> <p>Powder for injection: 200 mg in vial.</p> <p>Powder for oral liquid: 40 mg/mL.</p> <p>*For treatment of chronic pulmonary aspergillosis and acute invasive aspergillosis.</p>
Complementary List	
<input type="checkbox"/> <i>micafungin</i> <i>Therapeutic alternatives:</i> - <i>anidulafungin</i> - <i>caspofungin</i>	<p>Powder for injection: 50 mg (as sodium); 100 mg (as sodium) in vial.</p>
potassium iodide	Saturated solution.
6.4 Antiviral medicines	
6.4.1 Antiherpes medicines	
aciclovir	<p>Oral liquid: 200 mg/5 mL.</p> <p>Powder for injection: 250 mg (as sodium salt) in vial.</p> <p>Tablet: 200 mg.</p>
6.4.2 Antiretrovirals	
<p>Based on current evidence and experience of use, medicines in the following classes of antiretrovirals are included as essential medicines for treatment and prevention of HIV (prevention of mother-to-child transmission and post-exposure prophylaxis). WHO emphasizes the importance of using these products in accordance with global and national guidelines. WHO 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.</p> <p>Scored tablets can be used in children and therefore can be considered for inclusion in the listing of tablets, provided that adequate quality products are available.</p>	
6.4.2.1 Nucleoside/Nucleotide reverse transcriptase inhibitors	
lamivudine	Oral liquid: 50 mg/5 mL.
zidovudine	Oral liquid: 50 mg/5 mL.
6.4.2.2 Non-nucleoside reverse transcriptase inhibitors	
nevirapine <input type="checkbox"/>	<p>Oral liquid: 50 mg/5 mL.</p> <p>Tablet (dispersible): 50 mg.</p> <p><input type="checkbox"/> > 6 weeks</p>

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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).	
darunavir ^a	Tablet: 75 mg. ^a > 3 years
lopinavir + ritonavir	Solid oral dosage form: 40 mg + 10 mg. Tablet (heat stable): 100 mg + 25 mg.
ritonavir	Tablet (heat stable): 25 mg; 100 mg.
6.4.2.4 Integrase inhibitors	
dolutegravir ^a	Tablet (dispersible, scored): 10 mg. ^a ≥4 weeks and ≥3 kg Tablet: 50 mg. ^a ≥ 25 kg
raltegravir*	Granules for oral suspension: 100 mg in sachet. Tablet (chewable): 25 mg. *For use in second-line regimens in accordance with WHO treatment guidelines
6.4.2.5 Fixed-dose combinations of antiretroviral medicines	
abacavir + lamivudine	Tablet (dispersible, scored): 120 mg (as sulfate) + 60 mg.
lamivudine + zidovudine	Tablet: 30 mg + 60 mg.
6.4.2.6 Medicines for prevention of HIV-related opportunistic infections	
isoniazid + pyridoxine + sulfamethoxazole + trimethoprim	Tablet (scored): 300 mg + 25 mg + 800 mg + 160 mg
6.4.3 Other antivirals	
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.
Complementary List	
oseltamivir*	Capsule: 30 mg; 45 mg; 75 mg (as phosphate). *Severe illness due to confirmed or suspected influenza virus infection in critically ill hospitalized patients
valganciclovir*	Powder for oral solution: 50 mg/mL Tablet: 450 mg. *For the treatment of cytomegalovirus retinitis (CMVr).

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6.4.4 Antihepatitis medicines	
6.4.4.1 Medicines for hepatitis B	
6.4.4.1.1 Nucleoside/Nucleotide reverse transcriptase inhibitors	
entecavir	Oral liquid: 0.05 mg/ mL Tablet: 0.5 mg; 1 mg
6.4.4.2 Medicines for hepatitis C	
Pangenotypic direct-acting antivirals should be considered as therapeutically equivalent for the purposes of selection and procurement at national level.	
6.4.4.2.1 <input type="checkbox"/> Pangenotypic direct-acting antiviral combinations	
daclatasvir*	Tablet: 30 mg; 60 mg (as hydrochloride). *Pangenotypic when used in combination with sofosbuvir
daclatasvir + sofosbuvir	Tablet: 60 mg + 400 mg.
glecaprevir + pibrentasvir	Granules: 50 mg + 20 mg in sachet. Tablet: 100 mg + 40 mg.
sofosbuvir*	Tablet: 200 mg; 400 mg. *Pangenotypic when used in combination with daclatasvir
sofosbuvir + velpatasvir	Tablet: 200 mg + 50 mg; 400 mg + 100 mg
6.4.4.2.2 Non-pangenotypic direct-acting antiviral combinations	
6.4.4.2.3 Other antivirals for hepatitis C	
6.5 Antiprotozoal medicines	
6.5.1 Antiamoebic and anti giardiasis medicines	
diloxanide <input type="checkbox"/>	Tablet: 500 mg (furoate). <input type="checkbox"/> > 25 kg.
<input type="checkbox"/> metronidazole Therapeutic alternatives: - tinidazole	Injection: 500 mg in 100 mL vial. Oral liquid: 200 mg/5 mL (as benzoate). Tablet: 200 mg to 500 mg.
6.5.2 Antileishmaniasis medicines	
amphotericin B	Powder for injection: 50 mg in vial (as sodium deoxycholate or liposomal complex).
miltefosine	Solid oral dosage form: 10 mg; 50 mg.
paromomycin	Solution for intramuscular injection: 750 mg of paromomycin base (as sulfate).
sodium stibogluconate or meglumine antimoniate	Injection: 100 mg/mL, 1 vial = 30 mL or 30%, equivalent to approximately 8.1% antimony (pentavalent) in 5 mL ampoule.

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6.5.3 Antimalarial medicines	
6.5.3.1 For curative treatment	
Medicines for the treatment of <i>P. falciparum</i> malaria cases should be used in combination. The list currently recommends combinations according to treatment guidelines. WHO recognizes that not all of the fixed dose combinations (FDCs in the WHO treatment guidelines exist, and encourages their development and rigorous testing. WHO also encourages development and testing of rectal dosage formulations.	
amodiaquine*	Tablet: 153 mg or 200 mg (as hydrochloride). *To be used in combination with artesunate 50 mg.
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; 100 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.
artesunate + amodiaquine *	Tablet: 25 mg + 67.5 mg; 50 mg + 135 mg; 100 mg + 270 mg. *Other combinations that deliver the target doses required such as 153 mg or 200 mg (as hydrochloride) with 50 mg artesunate can be alternatives.
artesunate + mefloquine	Tablet: 25 mg + 55 mg; 100 mg + 220 mg.
artesunate + pyronaridine tetraphosphate ^a	Granules: 20 mg + 60 mg. Tablet: 60 mg + 180 mg. ^a > 5 kg
chloroquine*	Oral liquid: 50 mg/5 mL (as phosphate or sulfate). Tablet: 100 mg; 150 mg (as phosphate or sulfate). *For use only for the treatment of <i>Plasmodium vivax</i> infection.
dihydroartemisinin + piperazine phosphate ^a	Tablet: 20 mg + 160 mg; 40 mg + 320 mg. ^a > 5 kg
doxycycline*	Capsule: 100 mg (as hydrochloride or hyclate). Tablet (dispersible): 100 mg (as monohydrate). *For use only in combination with quinine.

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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>Plasmodium vivax</i> and <i>Plasmodium ovale</i> infections, given for 14 days.
quinine*	Injection: 300 mg/mL (hydrochloride) in 2 mL ampoule. Tablet: 300 mg (sulfate) or 300 mg (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 chemoprevention	
amodiaquine – sulfadoxine + pyrimethamine	Co-packaged dispersible tablets: amodiaquine 76.5 mg (as hydrochloride) [3] and sulfadoxine + pyrimethamine 250 mg + 12.5 mg [1]; amodiaquine 153 mg (as hydrochloride) [3] and sulfadoxine + pyrimethamine 500 mg + 25 mg [1].
chloroquine*	Oral liquid: 50 mg/5 mL (as phosphate or sulfate). Tablet: 150 mg (as phosphate or sulfate). *For use only for the treatment of <i>Plasmodium vivax</i> infection.
doxycycline ^a	Solid oral dosage form: 100 mg (as hydrochloride or hyclate). ^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.
sulfadoxine + pyrimethamine	Tablet: 250 mg + 12.5 mg.
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	
6.5.5.1 African trypanosomiasis	
fexinidazole*	Tablet: 600 mg *For the treatment of 1 st and 2 nd stage of human African trypanosomiasis due to <i>Trypanosoma brucei gambiense</i> infection.

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Medicines for the treatment of 1 st stage African trypanosomiasis.	
pentamidine*	Powder for injection: 200 mg (as 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 2 nd stage African trypanosomiasis	
eflornithine*	Injection: 200 mg/mL (hydrochloride) in 100 mL bottle. *To be used for the treatment of <i>Trypanosoma brucei gambiense</i> infection.
nifurtimox*	Tablet: 120 mg. *Only to be used in combination with eflornithine, for the treatment of <i>Trypanosoma brucei gambiense</i> infection.
Complementary List	
melarsoprol	Injection: 180 mg/5 mL in 5 mL ampoule (3.6% solution).
6.5.5.2 American trypanosomiasis	
benznidazole	Tablet: 12.5 mg; 100 mg. Tablet (scored): 50 mg.
nifurtimox	Tablet: 30 mg; 120 mg; 250 mg.
6.6 Medicines for ectoparasitic infections	
ivermectin	Tablet (scored): 3 mg
7. ANTIMIGRAINE MEDICINES	
7.1 For treatment of acute attack	
ibuprofen	Tablet: 200 mg; 400 mg.
paracetamol	Oral liquid: 120 mg/5 mL; 125 mg/5 mL. Tablet: 300 mg to 500 mg.
7.2 For prophylaxis	
propranolol	Tablet: 20 mg; 40 mg (hydrochloride).

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8. IMMUNOMODULATORS AND ANTINEOPLASTICS	
8.1 Immunomodulators for non-malignant disease	
Complementary List	
<input type="checkbox"/> <i>adalimumab</i> * Therapeutic alternatives*: - etanercept - infliximab *including quality-assured biosimilars	Injection: 40 mg/0.8 mL; 40 mg/0.4 mL.
<i>azathioprine</i>	Powder for injection: 100 mg (as sodium salt) in vial. Tablet (scored): 50 mg.
<i>ciclosporin</i>	Capsule: 25 mg. Concentrate for injection: 50 mg/mL in 1 mL ampoule.
<i>tacrolimus</i>	Capsule (immediate-release): 0.5 mg; 0.75 mg; 1 mg; 2 mg; 5 mg. Granules for oral suspension: 0.2 mg; 1 mg. Injection: 5 mg/mL in 1 mL vial.
8.2 Antineoplastic and supportive medicines	
Medicines listed below should be used according to protocols for treatment of the diseases.	
8.2.1 Cytotoxic medicines	
Complementary List	
<i>arsenic trioxide</i>	Concentrate for solution for infusion: 1 mg/mL – Acute promyelocytic leukaemia
<i>asparaginase</i> * *including quality-assured biosimilars	Powder for injection: 10 000 IU in vial. – Acute lymphoblastic leukaemia
<i>bleomycin</i>	Powder for injection: 15 mg (as sulfate) in vial. – Hodgkin lymphoma – Kaposi sarcoma – Testicular germ cell tumours – Ovarian germ cell tumours
<i>calcium folinate</i>	Injection: 3 mg/mL in 10 mL ampoule. Tablet: 5 mg; 15 mg; 25 mg. – Burkitt lymphoma – Osteosarcoma
<i>carboplatin</i>	Injection: 50 mg/5 mL; 150 mg/15 mL; 450 mg/45 mL; 600 mg/60 mL. – Low-grade glioma – Nephroblastoma (Wilms tumour) – Osteosarcoma – Ovarian germ cell tumour – Retinoblastoma – Testicular germ cell tumour

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<p><i>cisplatin</i></p>	<p>Injection: 10 mg/10 mL; 20 mg/20 mL; 50 mg/50 mL; 100 mg/100mL.</p> <ul style="list-style-type: none"> – Low-grade glioma – Nasopharyngeal cancer – Osteosarcoma – Ovarian germ cell tumours – Testicular germ cell tumours
<p><i>cyclophosphamide</i></p>	<p>Powder for injection: 500 mg; 1 g; 2 g in vial.</p> <p>Tablet: 25 mg; 50 mg.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Burkitt lymphoma – Diffuse large B-cell lymphoma – Ewing sarcoma – Hodgkin lymphoma – Low-grade glioma – Nephroblastoma (Wilms tumour) – Rhabdomyosarcoma
<p><i>cytarabine</i></p>	<p>Powder for injection: 100 mg in vial.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Acute myeloid leukaemia – Acute promyelocytic leukaemia – Burkitt lymphoma
<p><i>dacarbazine</i></p>	<p>Powder for injection: 100 mg in vial.</p> <ul style="list-style-type: none"> – Hodgkin lymphoma
<p><i>dactinomycin</i></p>	<p>Powder for injection: 500 micrograms in vial.</p> <ul style="list-style-type: none"> – Ewing sarcoma – Nephroblastoma (Wilms tumour) – Rhabdomyosarcoma
<p><i>daunorubicin</i></p>	<p>Powder for injection: 50 mg (hydrochloride) in vial.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Acute promyelocytic leukaemia.
<p><i>doxorubicin</i></p>	<p>Powder for injection: 10 mg; 50 mg (hydrochloride) in vial.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Burkitt lymphoma – Diffuse large B-cell lymphoma – Ewing sarcoma – Hodgkin lymphoma – Kaposi sarcoma – Nephroblastoma (Wilms tumour) – Osteosarcoma

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<p><i>etoposide</i></p>	<p>Capsule: 50 mg; 100 mg.</p> <p>Injection: 20 mg/mL in 5 mL ampoule.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Acute myeloid leukaemia – Burkitt lymphoma – Ewing sarcoma – Hodgkin lymphoma – Nephroblastoma (Wilms tumour) – Osteosarcoma – Ovarian germ cell tumours – Retinoblastoma – Testicular germ cell tumours
<p><i>fluorouracil</i></p>	<p>Injection: 50 mg/mL in 5 mL ampoule.</p> <ul style="list-style-type: none"> – Early stage colon cancer – Early stage rectal cancer – Nasopharyngeal cancer – Metastatic colorectal cancer
<p><i>hydroxycarbamide</i></p>	<p>Solid oral dosage form: 200 mg; 250 mg; 300 mg; 400 mg; 500 mg; 1 g.</p> <ul style="list-style-type: none"> – Chronic myeloid leukaemia
<p><i>ifosfamide</i></p>	<p>Powder for injection: 500 mg; 1 g; 2 g in vial.</p> <ul style="list-style-type: none"> – Burkitt lymphoma – Ewing sarcoma – Nephroblastoma (Wilms tumour) – Osteosarcoma – Ovarian germ cell tumours – Rhabdomyosarcoma – Testicular germ cell tumours
<p><i>irinotecan</i></p>	<p>Injection: 40 mg/2 mL in 2 mL vial; 100 mg/5 mL in 5 mL vial; 500 mg/25 mL in 25 mL vial.</p> <ul style="list-style-type: none"> – Metastatic colorectal cancer – Nephroblastoma (Wilms tumour) – Rhabdomyosarcoma
<p><i>mercaptopurine</i></p>	<p>Tablet: 50 mg.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Acute promyelocytic leukaemia
<p><i>methotrexate</i></p>	<p>Powder for injection: 50 mg (as sodium salt) in vial.</p> <p>Tablet: 2.5 mg (as sodium salt).</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Acute promyelocytic leukaemia – Burkitt lymphoma – Osteosarcoma
<p><i>oxaliplatin</i></p>	<p>Injection: 50 mg/10 mL in 10 mL vial; 100 mg/20 mL in 20 mL vial; 200 mg/40 mL in 40 mL vial.</p> <p>Powder for injection: 50 mg; 100 mg in vial.</p> <ul style="list-style-type: none"> – Early stage colon cancer – Metastatic colorectal cancer

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<i>paclitaxel</i>	Injection: 6 mg/mL in vial. – Ovarian germ cell tumours
<i>pegaspargase*</i> *including quality-assured biosimilars	Injection: 3,750 units/5 mL in vial – Acute lymphoblastic leukaemia.
<i>procarbazine</i>	Capsule: 50 mg (as hydrochloride). – Hodgkin lymphoma
<i>realgar-Indigo naturalis formulation</i>	Tablet: 270 mg (containing tetra-arsenic tetra-sulfide 30 mg) – Acute promyelocytic leukaemia
<i>tioguanine</i>	Solid oral dosage form: 40 mg. – Acute lymphoblastic leukaemia.
<i>vinblastine</i>	Injection: 10 mg/10 mL (sulfate) in vial. Powder for injection: 10 mg (sulfate) in vial. – Hodgkin lymphoma – Low-grade glioma – Ovarian germ cell tumours – Testicular germ cell tumours
<i>vincristine</i>	Injection: 1 mg/mL (sulfate); 2 mg/2 mL (sulfate) in vial. Powder for injection: 1 mg; 5 mg (sulfate) in vial. – Acute lymphoblastic leukaemia – Burkitt lymphoma. – Diffuse large B-cell lymphoma – Ewing sarcoma – Hodgkin lymphoma – Kaposi sarcoma – Low-grade glioma – Nephroblastoma (Wilms tumour) – Retinoblastoma – Rhabdomyosarcoma
<i>vinorelbine</i>	Capsule: 20 mg; 30 mg; 80 mg. Injection: 10 mg/mL in 1 mL vial; 50 mg/5 mL in 5 mL vial. – Rhabdomyosarcoma
8.2.2 Targeted therapies	
Complementary List	
<i>all-trans retinoid acid (ATRA)</i>	Capsule: 10 mg. – Acute promyelocytic leukaemia
<i>dasatinib</i>	Tablet: 20 mg; 50 mg; 70 mg; 80 mg; 100 mg; 140 mg. – Imatinib-resistant chronic myeloid leukaemia
<i>everolimus</i>	Tablet: 2.5 mg; 5 mg; 7.5 mg; 10 mg. Tablet (dispersible): 2 mg; 3 mg; 5 mg. – Subependymal giant cell astrocytoma

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<i>imatinib</i>	<p>Solid oral dosage form: 100 mg; 400 mg.</p> <ul style="list-style-type: none"> – Chronic myeloid leukaemia – Gastrointestinal stromal tumour – Philadelphia chromosome positive acute lymphoblastic leukaemia
<i>nilotinib</i>	<p>Capsule: 150 mg; 200 mg.</p> <ul style="list-style-type: none"> – Imatinib-resistant chronic myeloid leukaemia
<p><i>rituximab*</i></p> <p><i>*including quality-assured biosimilars</i></p>	<p>Injection (intravenous): 100 mg/10 mL in 10 mL vial; 500 mg/50 mL in 50 mL vial.</p> <ul style="list-style-type: none"> – Diffuse large B-cell lymphoma
8.2.3 Immunomodulators	
Complementary List	
<p><i>filgrastim*</i></p> <p><i>*including quality-assured biosimilars</i></p>	<p>Injection: 120 micrograms/0.2 mL; 300 micrograms/0.5 mL; 480 micrograms/0.8 mL in pre-filled syringe.</p> <p>Injection: 300 micrograms/mL in 1 mL vial; 480 micrograms/1.6 mL in 1.6 mL vial.</p> <ul style="list-style-type: none"> – Primary prophylaxis in patients at high risk for developing febrile neutropenia associated with myelotoxic chemotherapy. – Secondary prophylaxis for patients who have experienced neutropenia following prior myelotoxic chemotherapy – To facilitate administration of dose dense chemotherapy regimens
8.2.4 Hormones and antihormones	
Complementary List	
<i>dexamethasone</i>	<p>Injection: 4 mg/mL (as disodium phosphate salt) in 1 mL ampoule.</p> <p>Oral liquid: 2 mg/5 mL.</p> <p>Tablet: 2 mg; 4 mg.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Burkitt lymphoma
<i>hydrocortisone</i>	<p>Powder for injection: 100 mg (as sodium succinate) in vial.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Burkitt lymphoma
<i>methylprednisolone</i>	<p>Injection: 40 mg/mL (as sodium succinate) in 1 mL single-dose vial and 5 mL multi-dose vials; 80 mg/mL (as sodium succinate) in 1 mL single-dose vial.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukemia – Burkitt lymphoma

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<p><input type="checkbox"/> prednisolone</p> <p>Therapeutic alternatives:</p> <p>- prednisone</p>	<p>Oral liquid: 5 mg/mL.</p> <p>Tablet: 5 mg; 25 mg.</p> <ul style="list-style-type: none"> - Acute lymphoblastic leukaemia - Burkitt lymphoma - Diffuse large B-cell lymphoma - Hodgkin lymphoma
<p>8.2.5 Supportive medicines</p>	
<p>Complementary List</p>	
<p>allopurinol</p>	<p>Tablet: 100 mg; 300 mg.</p> <ul style="list-style-type: none"> - Tumour lysis syndrome
<p>mesna</p>	<p>Injection: 100 mg/mL in 4 mL and 10 mL ampoules.</p> <p>Tablet: 400 mg; 600 mg.</p> <ul style="list-style-type: none"> - Burkitt lymphoma - Ewing sarcoma - Nephroblastoma (Wilms tumour) - Osteosarcoma - Ovarian germ cell tumours - Rhabdomyosarcoma - Testicular germ cell tumours
<p>rasburicase</p>	<p>Powder and solvent for solution for infusion: 1.5 mg; 7.5 mg in vial</p> <ul style="list-style-type: none"> - Tumour lysis syndrome
<p>9. ANTIPARKINSONISM MEDICINES</p>	
<p>10. MEDICINES AFFECTING THE BLOOD</p>	
<p>10.1 Antianaemia medicines</p>	
<p>ferrous salt</p>	<p>Oral liquid: equivalent to 25 mg iron (as sulfate)/mL.</p> <p>Tablet: equivalent to 60 mg iron.</p>
<p>folic acid</p>	<p>Tablet: 1 mg; 5 mg.</p>
<p>hydroxocobalamin</p>	<p>Injection: 1 mg (as acetate, as hydrochloride or as sulfate) in 1 mL ampoule.</p>
<p>Complementary List</p>	
<p><input type="checkbox"/> erythropoiesis-stimulating agents</p> <p>Therapeutic alternatives:</p> <ul style="list-style-type: none"> - epoetin alfa, beta and theta - darbepoetin alfa <p>*including quality-assured biosimilars</p>	<p>Injection: pre-filled syringe</p> <p>1000 IU/0.5 mL; 2000 IU/0.5 mL; 3000 IU/0.3 mL; 4000 IU/0.4 mL; 5000 IU/0.5 mL; 6000 IU/0.6 mL; 8000 IU/0.8mL; 10 000 IU/1 mL; 20 000 IU/0.5 mL; 40 000 IU/1 mL.</p>
<p>10.2 Medicines affecting coagulation</p>	
<p><input type="checkbox"/> enoxaparin</p> <p>Therapeutic alternatives:</p> <ul style="list-style-type: none"> - dalteparin - nadroparin <p>*including quality-assured biosimilars</p>	<p>Injection: ampoule or pre-filled syringe</p> <p>20 mg/0.2 mL; 40 mg/0.4 mL; 60 mg/0.6 mL; 80 mg/0.8 mL; 100 mg/1 mL; 120 mg/0.8 mL; 150 mg/1 mL.</p>

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phytomenadione	Injection: 1 mg/mL; 10 mg/mL in ampoule. Tablet: 10 mg.
Complementary List	
<i>desmopressin</i>	Injection: 4 micrograms/mL (as acetate) in 1 mL ampoule. Nasal spray: 10 micrograms (as acetate) per dose.
<i>heparin sodium</i>	Injection: 1000 IU/mL; 5000 IU/mL in 1 mL ampoule.
<i>protamine sulfate</i>	Injection: 10 mg/mL in 5 mL ampoule.
<input type="checkbox"/> <i>warfarin</i> <i>Therapeutic alternatives to be reviewed (2023)</i>	Tablet: 0.5 mg; 1 mg; 2 mg; 5 mg (sodium).
10.3 Other medicines for haemoglobinopathies	
Complementary list	
<input type="checkbox"/> <i>deferoxamine*</i> <i>Therapeutic alternatives:</i> - <i>deferasirox (oral)</i>	Powder for injection: 500 mg (mesilate) in vial.
<i>hydroxycarbamide</i>	Solid oral dosage form: 200 mg; 500 mg; 1 g.
11. BLOOD PRODUCTS OF HUMAN ORIGIN AND PLASMA SUBSTITUTES	
11.1 Blood and blood components	
In accordance with the World Health Assembly resolution WHA63.12, WHO recognizes that achieving self-sufficiency, unless special circumstances preclude it, in the supply of safe blood components based on voluntary, non-remunerated blood donation, and the security of that supply are important national goals to prevent blood shortages and meet the transfusion requirements of the patient population. All preparations should comply with the WHO requirements.	
fresh-frozen plasma	
platelets	
red blood cells	
whole blood	
11.2 Plasma-derived medicines	
All human plasma-derived medicines should comply with the WHO requirements.	
11.2.1 Human immunoglobulins	
anti-rabies immunoglobulin	Injection: 150 IU/mL in vial.
anti-tetanus immunoglobulin	Injection: 500 IU in vial.
Complementary List	
<i>normal immunoglobulin</i>	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.

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11.2.2 Blood coagulation factors	
<i>Complementary List</i>	
<input type="checkbox"/> coagulation factor VIII Therapeutic alternatives to be reviewed (2023)	Powder for injection: 500 IU/vial.
<input type="checkbox"/> coagulation factor IX Therapeutic alternatives to be reviewed (2023)	Powder for injection: 500 IU/vial, 1000 IU/vial.
11.3 Plasma substitutes	
<input type="checkbox"/> dextran 70 Therapeutic alternatives: - Polygeline injectable solution 3.5%	Injectable solution: 6%.
12. CARDIOVASCULAR MEDICINES	
12.1 Antianginal medicines	
12.2 Antiarrhythmic medicines	
12.3 Antihypertensive medicines	
<input type="checkbox"/> enalapril Therapeutic alternatives: - 4 th level ATC chemical subgroup (C09AA ACE inhibitors, plain)	Tablet: 2.5 mg; 5 mg (as hydrogen maleate).
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	Injection: 40 mg/mL (hydrochloride) in 5 mL vial.
12.5 Antithrombotic medicines	
12.6 Lipid-lowering agents	

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13. DERMATOLOGICAL MEDICINES (topical)	
13.1 Antifungal medicines	
<input type="checkbox"/> miconazole Therapeutic alternatives: - 4 th level ATC chemical subgroup (D01AC Imidazole and triazole derivatives) excluding combinations	Cream or ointment: 2% (nitrate).
terbinafine	Cream or ointment: 1% (hydrochloride).
13.2 Anti-infective medicines	
mupirocin	Cream: 2% (as calcium). Ointment: 2%.
potassium permanganate	Aqueous solution: 1:10 000.
silver sulfadiazine <input type="checkbox"/>	Cream: 1%. <input type="checkbox"/> > 2 months.
13.3 Anti-inflammatory and antipruritic medicines	
<input type="checkbox"/> betamethasone <input type="checkbox"/> Therapeutic alternatives: - 4 th level ATC chemical subgroup (D07AC Corticosteroids, potent (group III))	Cream or ointment: 0.1% (as valerate). <input type="checkbox"/> Hydrocortisone preferred in neonates.
calamine	Lotion.
hydrocortisone	Cream or ointment: 1% (acetate).
13.4 Medicines affecting skin differentiation and proliferation	
benzoyl peroxide	Cream or lotion: 5%.
<input type="checkbox"/> calcipotriol Therapeutic alternatives: - calcitriol - tacalcitol	Cream or ointment: 50 micrograms/mL (0.005%). Lotion: 50 micrograms/mL (0.005%).
coal tar	Solution: 5%.
<input type="checkbox"/> podophyllum resin Therapeutic alternatives: - podophyllotoxin	Solution: 10% to 25%.
salicylic acid	Solution: 5%.
urea	Cream or ointment: 5%; 10%.
13.5 Scabicides and pediculicides	
<input type="checkbox"/> benzyl benzoate <input type="checkbox"/> Therapeutic alternatives: - precipitated sulfur topical ointment	Lotion: 25%. <input type="checkbox"/> > 2 years.
permethrin	Cream: 5%. Lotion: 1%.

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14. DIAGNOSTIC AGENTS	
14.1 Ophthalmic medicines	
fluorescein	Eye drops: 1% (sodium salt).
<input type="checkbox"/> tropicamide Therapeutic alternatives: - atropine - cyclopentolate	Eye drops: 0.5%.
14.2 Radiocontrast media	
<i>Complementary List</i>	
<i>barium sulfate</i>	<i>Aqueous suspension.</i>
15. ANTISEPTICS AND DISINFECTANTS	
15.1 Antiseptics	
<input type="checkbox"/> chlorhexidine Therapeutic alternatives to be reviewed (2023)	Solution: 5% (digluconate).
<input type="checkbox"/> ethanol Therapeutic alternatives: - propanol	Solution: 70% (denatured).
<input type="checkbox"/> povidone iodine Therapeutic alternatives - iodine	Solution: 10% (equivalent to 1% available iodine).
15.2 Disinfectants	
alcohol based hand rub	Solution containing ethanol 80% volume /volume. Solution containing isopropyl alcohol 75% volume/volume.
chlorine base compound	Liquid: (0.1% available chlorine) for solution. Powder: (0.1% available chlorine) for solution. Solid: (0.1% available chlorine) for solution.
<input type="checkbox"/> chloroxylenol Therapeutic alternatives: - 4 th level ATC chemical subgroup (D08AE Phenol and derivatives)	Solution: 4.8%.
glutaral	Solution: 2%.

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16. DIURETICS	
furosemide	Injection: 10 mg/mL in 2 mL ampoule. Oral liquid: 20 mg/5 mL. Tablet: 10 mg; 20 mg; 40 mg.
Complementary List	
<input type="checkbox"/> hydrochlorothiazide Therapeutic alternatives: - chlorothiazide - chlortalidone	Tablet (scored): 25 mg.
mannitol	Injectable solution: 10%; 20%.
spironolactone	Oral liquid: 5 mg/5 mL; 10 mg/5 mL; 25 mg/5 mL. Tablet: 25 mg.
17. GASTROINTESTINAL MEDICINES	
Complementary List	
pancreatic enzymes	Age-appropriate formulations and doses including lipase, protease and amylase.
17.1 Antiulcer medicines	
<input type="checkbox"/> omeprazole Therapeutic alternatives: - 4 th level ATC chemical subgroup (A02BC Proton pump inhibitors) excluding combinations	Powder for oral liquid: 20 mg; 40 mg sachets. Solid oral dosage form: 10 mg; 20 mg; 40 mg.
<input type="checkbox"/> ranitidine - 4 th level ATC chemical subgroup (A02BA H ₂ -receptor antagonists) excluding combinations	Injection: 25 mg/mL (as hydrochloride) in 2 mL ampoule. Oral liquid: 75 mg/5 mL (as hydrochloride). Tablet: 150 mg (as hydrochloride).
17.2 Antiemetic medicines	
dexamethasone	Injection: 4 mg/mL in 1 mL ampoule (as disodium phosphate salt). 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/mL (hydrochloride) in 2 mL ampoule. Oral liquid: 5 mg/5 mL. Tablet: 10 mg (hydrochloride). ^a Not in neonates.
<input type="checkbox"/> ondansetron ^a Therapeutic alternatives: - dolasetron - granisetron - palonosetron - tropisetron	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.

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<i>Complementary list</i>	
<i>aprepitant</i>	Capsule: 80 mg; 125 mg; 165 mg Powder for oral suspension: 125 mg in sachet
17.3 Anti-inflammatory medicines	
17.4 Laxatives	
17.5 Medicines used in diarrhoea	
oral rehydration salts – zinc sulfate	Co-package containing: ORS powder for dilution (see Section 17.5.1) – zinc sulfate solid oral dosage form 20 mg (see Section 17.5.2)
17.5.1 Oral rehydration	
oral rehydration salts	Powder for dilution in 200 mL; 500 mL; 1 L. 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 recommended only when manufactured for immediate use.
17.5.2 Medicines for diarrhoea	
zinc sulfate*	Solid oral dosage form: 20 mg. *In acute diarrhoea, zinc sulfate should be used as an adjunct to oral rehydration salts.
18. MEDICINES FOR ENDOCRINE DISORDERS	
18.1 Adrenal hormones and synthetic substitutes	
fludrocortisone	Tablet: 100 micrograms (acetate).
hydrocortisone	Tablet: 5 mg; 10 mg; 20 mg.
18.2 Androgens	
18.3 Estrogens	
18.4 Progestogens	

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18.5 Medicines for diabetes	
18.5.1 Insulins	
insulin injection (soluble)* <i>*including quality-assured biosimilars</i>	Injection: 100 IU/mL in 10 mL vial.
intermediate-acting insulin* <i>*including quality-assured biosimilars</i>	Injection: 100 IU/mL in 10 mL vial (as compound insulin zinc suspension or isophane insulin).
<input type="checkbox"/> long-acting insulin analogues* Therapeutic alternatives: - insulin detemir - insulin degludec - insulin glargine <i>*including quality-assured biosimilars</i>	Injection: 100 IU/mL in 3 mL cartridge or pre-filled pen.
18.5.2 Oral hypoglycaemic agents	
Complementary List	
<i>metformin</i>	Tablet: 500 mg (hydrochloride).
18.6 Medicines for hypoglycaemia	
glucagon	Injection: 1 mg/mL.
Complementary List	
<i>diazoxide</i>	Oral liquid: 50 mg/mL Tablet: 50 mg
18.7 Thyroid hormones and antithyroid medicines	
levothyroxine	Tablet: 25 micrograms; 50 micrograms; 100 micrograms (sodium salt).
Complementary List	
<i>Lugol's solution</i>	Oral liquid: about 130 mg total iodine/mL.
<input type="checkbox"/> methimazole Therapeutic alternatives: - carbimazole (depending on local availability)	Tablet: 5mg, 10mg, 20mg.
<i>potassium iodide</i>	Tablet: 60 mg.
<i>propylthiouracil*</i>	Tablet: 50 mg. <i>*For use when alternative first-line treatment is not appropriate or available</i>

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19. IMMUNOLOGICALS	
19.1 Diagnostic agents	
All tuberculins should comply with the WHO requirements for tuberculins.	
tuberculin, purified protein derivative (PPD)	Injection.
19.2 Sera, immunoglobulins and monoclonal antibodies	
All plasma fractions should comply with the WHO requirements.	
anti-rabies virus monoclonal antibodies* <i>*including quality-assured biosimilars</i>	Injection: 40 IU/mL in 1.25 mL, 2.5 mL vial; 100 IU/mL in 2.5 mL vial (human). Injection: 300 IU/mL in 10 mL vial; 600 IU/mL in 1 mL, 2.5 mL and 5 mL vial (murine).
antivenom immunoglobulin*	Injection. *Exact type to be defined locally.
diphtheria antitoxin	Injection: 10 000 IU; 20 000 IU in vial.
equine rabies immunoglobulin	Injection: 150 IU/mL; 200 IU/mL; 300 IU/mL; 400 IU/mL in vial
19.3 Vaccines	
WHO immunization policy recommendations are published in vaccine position papers on the basis of recommendations made by the Strategic Advisory Group of Experts on Immunization (SAGE).	
WHO vaccine position papers are updated three to four times per year. The list below details the vaccines for which there is a recommendation from SAGE and a corresponding WHO position paper as at September 2020. The most recent versions of the WHO position papers, reflecting the current evidence related to a specific vaccine and the related recommendations, can be accessed at any time on the WHO website at:	
https://www.who.int/teams/immunization-vaccines-and-biologicals/policies/position-papers	
Vaccine recommendations may be universal or conditional (e.g., in certain regions, in some high-risk populations or as part of immunization programmes with certain characteristics). Details are available in the relevant position papers, and in the Summary Tables of WHO Routine Immunization Recommendations available on the WHO website at:	
https://www.who.int/teams/immunization-vaccines-and-biologicals/policies/who-recommendations-for-routine-immunization---summary-tables	
Selection of vaccines from the Model List will need to be determined by each country after consideration of international recommendations, epidemiology and national priorities.	
All vaccines should comply with the WHO requirements for biological substances.	
WHO noted the need for vaccines used in children to be polyvalent.	
Recommendations for all	
BCG vaccine	
diphtheria vaccine	
Haemophilus influenzae type b vaccine	
hepatitis B vaccine	
human papilloma virus (HPV) vaccine	
measles vaccine	
pertussis vaccine	
pneumococcal vaccine	
poliomyelitis vaccine	

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rotavirus vaccine	
rubella vaccine	
tetanus vaccine	
<i>Recommendations for certain regions</i>	
Japanese encephalitis vaccine	
tick-borne encephalitis vaccine	
yellow fever vaccine	
<i>Recommendations for some high-risk populations</i>	
cholera vaccine	
dengue vaccine	
hepatitis A vaccine	
meningococcal meningitis vaccine	
rabies vaccine	
typhoid vaccine	
<i>Recommendations for immunization programmes with certain characteristics</i>	
influenza vaccine (seasonal)	
mumps vaccine	
varicella vaccine	

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20. MUSCLE RELAXANTS (PERIPHERALLY-ACTING) AND CHOLINESTERASE INHIBITORS	
neostigmine	Injection: 500 micrograms/mL (methylsulfate) in 1 mL ampoule; 2.5 mg/mL (methylsulfate) in 1 mL ampoule. Tablet: 15 mg (bromide).
suxamethonium	Injection: 50 mg/mL (chloride) in 2 mL ampoule. Powder for injection: (chloride), in vial.
<input type="checkbox"/> vecuronium Therapeutic alternatives to be reviewed (2023)	Powder for injection: 10 mg (bromide) in vial.
Complementary List	
<i>pyridostigmine</i>	Injection: 1 mg in 1 mL ampoule. Tablet: 60 mg (bromide).
21. OPHTHALMOLOGICAL PREPARATIONS	
21.1 Anti-infective agents	
aciclovir	Ointment: 3% w/w.
azithromycin	Solution (eye drops): 1.5% – <i>Trachoma</i>
erythromycin	Ointment: 0.5% – <i>Infections due to Chlamydia trachomatis or Neisseria gonorrhoeae.</i>
<input type="checkbox"/> gentamicin Therapeutic alternatives: - amikacin - kanamycin - netilmicin - tobramycin	Solution (eye drops): 0.3% (sulfate). – <i>Bacterial blepharitis</i> – <i>Bacterial conjunctivitis</i>
natamycin	Suspension (eye drops): 5% – <i>Fungal keratitis</i>
<input type="checkbox"/> ofloxacin Therapeutic alternatives: - 4 th level ATC chemical subgroup (S01AE Fluoroquinolones)	Solution (eye drops): 0.3%. – <i>Bacterial conjunctivitis</i> – <i>Bacterial keratitis</i>
<input type="checkbox"/> tetracycline Therapeutic alternatives: - chlortetracycline - oxytetracycline	Eye ointment: 1% (hydrochloride). – <i>Bacterial blepharitis</i> – <i>Bacterial conjunctivitis</i> – <i>Bacterial keratitis</i> – <i>Trachoma</i>
21.2 Anti-inflammatory agents	
<input type="checkbox"/> prednisolone Therapeutic alternatives to be reviewed (2023)	Solution (eye drops): 0.5% (sodium phosphate).

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21.3 Local anaesthetics	
<input type="checkbox"/> tetracaine ^a Therapeutic alternatives: - 4 th level ATC chemical subgroup (S01HA Local anaesthetics) excluding cocaine and combinations	Solution (eye drops): 0.5% (hydrochloride). ^a Not in preterm neonates.
21.4 Miotics and antiglaucoma medicines	
21.5 Mydriatics	
<input type="checkbox"/> atropine ^a Therapeutic alternatives: - homatropine hydrobromide - cyclopentolate hydrochloride	Solution (eye drops): 0.1%; 0.5%; 1% (sulfate). ^a > 3 months.
Complementary List	
<i>epinephrine (adrenaline)</i>	Solution (eye drops): 2% (as hydrochloride).
21.6 Anti-vascular endothelial growth factor (VEGF) preparations	
22. MEDICINES FOR REPRODUCTIVE HEALTH AND PERINATAL CARE	
22.1 Contraceptives	
22.2 Ovulation inducers	
22.3 Uterotonics	
22.4 Antioxytocics (tocolytics)	
22.5 Other medicines administered to the mother	
22.6 Medicines administered to the neonate	
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).
chlorhexidine	Solution or gel: 7.1% (digluconate) delivering 4% chlorhexidine (for umbilical cord care).
Complementary List	
<input type="checkbox"/> <i>ibuprofen</i> Therapeutic alternatives: - <i>indometacin</i>	Solution for injection: 5 mg/mL.
<input type="checkbox"/> <i>prostaglandin E1</i> Therapeutic alternatives: - <i>prostaglandin E2</i>	Solution for injection: 0.5 mg/mL in alcohol.
<i>surfactant</i>	Suspension for intratracheal instillation: 25 mg/mL or 80 mg/mL
23. PERITONEAL DIALYSIS SOLUTION	
Complementary List	
<i>intraperitoneal dialysis solution (of appropriate composition)</i>	Parenteral solution.

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24. MEDICINES FOR MENTAL AND BEHAVIOURAL DISORDERS	
24.1 Medicines used in psychotic disorders	
<i>Complementary List</i>	
<i>chlorpromazine</i>	Injection: 25 mg/mL (hydrochloride) in 2 mL ampoule. Oral liquid: 25 mg/5 mL (hydrochloride). Tablet: 10 mg; 25 mg; 50 mg; 100 mg (hydrochloride).
<i>haloperidol</i>	Injection: 5 mg in 1 mL ampoule. Oral liquid: 2 mg/mL. Solid oral dosage form: 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	Solid oral dosage form: 20 mg (as hydrochloride). ^a > 8 years.
24.2.2 Medicines used in bipolar disorders	
24.3 Medicines for anxiety disorders	
24.4 Medicines used for obsessive compulsive disorders	
24.5 Medicines for disorders due to psychoactive substance use	
25. MEDICINES ACTING ON THE RESPIRATORY TRACT	
25.1 Antiasthmatic medicines	
<input type="checkbox"/> budesonide Therapeutic alternatives: - beclometasone - ciclesonide - flunisolide - fluticasone - mometasone	Inhalation (aerosol): 100 micrograms per dose; 200 micrograms per dose.
epinephrine (adrenaline)	Injection: 1 mg/mL (as hydrochloride or hydrogen tartrate) in 1 mL ampoule.
<input type="checkbox"/> salbutamol Therapeutic alternatives: - terbutaline	Injection: 50 micrograms/mL (as sulfate) in 5 mL ampoule. Metered dose inhaler (aerosol): 100 micrograms (as sulfate) per dose. Respirator solution for use in nebulizers: 5 mg/mL (as sulfate).
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.

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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 Na ⁺ 150 mmol/L and Cl ⁻ 150 mmol/L); 5% glucose, 0.45% sodium chloride (equivalent to Na ⁺ 75 mmol/L and Cl ⁻ 75 mmol/L).
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	
ascorbic acid	Tablet: 50 mg.
<input type="checkbox"/> colecalciferol Therapeutic alternatives: - ergocalciferol	Oral liquid: 400 IU/mL. Solid oral dosage form: 400 IU; 1000 IU.
iodine	Capsule: 190 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.
multiple micronutrient powder	Sachets containing: - iron (elemental) 12.5 mg (as coated ferrous fumarate) - zinc (elemental) 5 mg - vitamin A 300 micrograms - with or without other micronutrients at recommended daily values
pyridoxine	Tablet: 25 mg (hydrochloride).
retinol	Capsule: 100 000 IU; 200 000 IU (as palmitate). Oral oily solution: 100 000 IU/mL (as palmitate) 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.
thiamine	Tablet: 50 mg (hydrochloride).
Complementary List	
calcium gluconate	Injection: 100 mg/mL in 10 mL ampoule.

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28. EAR, NOSE AND THROAT MEDICINES	
acetic acid	Topical: 2%, in alcohol.
<input type="checkbox"/> budesonide Therapeutic alternatives to be reviewed (2023)	Nasal spray: 100 micrograms per dose.
<input type="checkbox"/> ciprofloxacin Therapeutic alternatives: - ofloxacin	Solution (ear drops): 0.3% (as hydrochloride).
<input type="checkbox"/> xylometazoline ^a Therapeutic alternatives to be reviewed (2023)	Nasal spray: 0.05%. ^a Not in children less than 3 months.
29. MEDICINES FOR DISEASES OF JOINTS	
29.1 Medicines used to treat gout	
29.2 Disease-modifying anti-rheumatic drugs (DMARDs)	
<i>Complementary List</i>	
<i>hydroxychloroquine</i>	Solid oral dosage form: 200 mg (as sulfate).
<i>methotrexate</i>	Tablet: 2.5 mg (as sodium salt).
29.3 Juvenile joint diseases	
<i>Complementary List</i>	
<i>acetylsalicylic acid*</i> (acute or chronic use)	Suppository: 50 mg to 150 mg. Tablet: 100 mg to 500 mg. <i>*For use for rheumatic fever, juvenile arthritis, Kawasaki disease.</i>
30. DENTAL PREPARATIONS	
fluoride	Paste, cream or gel: containing between 1000 and 1500 ppm fluoride (any type). In other appropriate topical formulations.
glass ionomer cement	Single-use capsules: 0.4 g powder + 0.09 mL liquid Multi-use bottle: powder + liquid Powder (fluoro-alumino-silicate glass) contains: 25-50% silicate, 20-40% aluminium oxide, 1-20% fluoride, 15-40% metal oxide, 0-15% phosphate, remainder are polyacrylic acid powder and metals in minimal quantities. Liquid (aqueous) contains: 7-25% polybasic carboxylic acid, 45-60% polyacrylic acid.
silver diamine fluoride	Solution: 38% w/v

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