

# World Health Organization Model List of Essential Medicines for Children

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7th List  
2019



World Health  
Organization



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7th edition

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## WHO Model List of Essential Medicines for Children (2019)

### Explanatory notes

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**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 indicated only 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 21st WHO Model List of Essential Medicines is used for the 7<sup>th</sup> WHO Model Essential List for Children. Some sections have been deleted because they contain medicines that are not relevant for children.

The **a** 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 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 [http://www.who.int/medicines/areas/quality\\_safety/quality\\_assurance/en/](http://www.who.int/medicines/areas/quality_safety/quality_assurance/en/).

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 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* <http://www.who.int/medicines/publications/pharmacopoeia>.

<b>1. ANAESTHETICS, PREOPERATIVE MEDICINES AND MEDICAL GASES</b>	
<b>1.1 General anaesthetics and oxygen</b>	
<b>1.1.1 Inhalational medicines</b>	
halothane	Inhalation.
isoflurane	Inhalation.
nitrous oxide	Inhalation.
oxygen	Inhalation (medical gas).
<b>1.1.2 Injectable medicines</b>	
ketamine	Injection: 50 mg (as hydrochloride)/mL in 10-mL vial.
propofol *	Injection: 10 mg/mL; 20 mg/mL. * Thiopental may be used as an alternative depending on local availability and cost.
<b>1.2 Local anaesthetics</b>	
<input type="checkbox"/> 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.
<input type="checkbox"/> 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 or sulfate) + epinephrine 1:200 000 in vial.
<b>1.3 Preoperative medication and sedation for short-term procedures</b>	
atropine	Injection: 1 mg (sulfate) in 1-mL ampoule.
<input type="checkbox"/> midazolam	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.
<b>1.4 Medical gases</b>	
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.
<b>2. MEDICINES FOR PAIN AND PALLIATIVE CARE</b>	
<b>2.1 Non-opioids and non-steroidal anti-inflammatory medicines (NSAIDs)</b>	

ibuprofen <input type="checkbox"/> a	<p><b>Oral liquid:</b> 200 mg/5 mL.</p> <p><b>Tablet:</b> 200 mg; 400 mg; 600 mg.</p> <p><input type="checkbox"/> a Not in children less than 3 months.</p>
paracetamol*	<p><b>Oral liquid:</b> 120 mg/5 mL; 125 mg/5 mL.</p> <p><b>Suppository:</b> 100 mg.</p> <p><b>Tablet:</b> 100 mg to 500 mg.</p> <p>* Not recommended for anti-inflammatory use due to lack of proven benefit to that effect.</p>
<b>2.2 Opioid analgesics</b>	
<input type="checkbox"/> morphine*	<p><b>Granules (slow release; to mix with water):</b> 20 mg to 200 mg (morphine sulfate).</p> <p><b>Injection:</b> 10 mg (morphine hydrochloride or morphine sulfate) in 1-mL ampoule.</p> <p><b>Oral liquid:</b> 10 mg (morphine hydrochloride or morphine sulfate)/5 mL.</p> <p><b>Tablet (slow release):</b> 10 mg – 200mg (morphine hydrochloride or morphine sulfate).</p> <p><b>Tablet (immediate release):</b> 10 mg (morphine sulfate).</p> <p>*Alternatives limited to hydromorphone and oxycodone.</p>
<i>Complementary list</i>	
methadone*	<p><b>Tablet:</b> 5 mg; 10 mg (as hydrochloride).</p> <p><b>Oral liquid:</b> 5mg/ 5mL; 10mg/ 5mL (as hydrochloride).</p> <p><b>Concentrate for oral liquid:</b> 5 mg/ mL; 10mg/ mL (as hydrochloride)</p> <p>*For the management of cancer pain.</p>
<b>2.3 Medicines for other symptoms common in palliative care</b>	
amitriptyline	<b>Tablet:</b> 10 mg; 25 mg.
cyclizine	<b>Injection:</b> 50 mg/mL. <b>Tablet:</b> 50 mg.
dexamethasone	<b>Injection:</b> 4 mg/mL in 1-mL ampoule (as disodium phosphate salt). <b>Oral liquid:</b> 2 mg/5 mL. <b>Tablet:</b> 2 mg.
diazepam	<b>Injection:</b> 5 mg/mL. <b>Oral liquid:</b> 2 mg/5 mL. <b>Rectal solution:</b> 2.5 mg; 5 mg; 10 mg. <b>Tablet:</b> 5 mg; 10 mg.
docusate sodium	<b>Capsule:</b> 100 mg. <b>Oral liquid:</b> 50 mg/5 mL.
fluoxetine <input type="checkbox"/> a	<b>Solid oral dosage form:</b> 20 mg (as hydrochloride). <input type="checkbox"/> a >8 years.

hyoscine hydrobromide	<b>Injection:</b> 400 micrograms/mL; 600 micrograms/mL. <b>Transdermal patches:</b> 1 mg/72 hours.
lactulose	<b>Oral liquid:</b> 3.1–3.7 g/5 mL.
midazolam	<b>Injection:</b> 1 mg/mL; 5 mg/mL. <b>Oral liquid:</b> 2mg/mL. <b>Solid oral dosage form:</b> 7.5 mg; 15 mg.
<input type="checkbox"/> ondansetron <sup>a</sup>	<b>Injection:</b> 2 mg base/mL in 2-mL ampoule (as hydrochloride). <b>Oral liquid:</b> 4 mg base/5 mL. <b>Solid oral dosage form:</b> Eq 4 mg base; Eq 8 mg base. <sup>a</sup> >1 month.
senna	<b>Oral liquid:</b> 7.5 mg/5 mL.
<b>3. ANTIALLERGICS AND MEDICINES USED IN ANAPHYLAXIS</b>	
dexamethasone	<b>Injection:</b> 4 mg/mL in 1-mL ampoule (as disodium phosphate salt).
epinephrine (adrenaline)	<b>Injection:</b> 1 mg (as hydrochloride <b>or</b> hydrogen tartrate) in 1-mL ampoule.
hydrocortisone	<b>Powder for injection:</b> 100 mg (as sodium succinate) in vial.
<input type="checkbox"/> loratadine *	<b>Oral liquid:</b> 1 mg/mL. <b>Tablet:</b> 10 mg. *There may be a role for sedating antihistamines for limited indications.
<input type="checkbox"/> prednisolone	<b>Oral liquid:</b> 5 mg/mL. <b>Tablet:</b> 5 mg; 25 mg.
<b>4. ANTIDOTES AND OTHER SUBSTANCES USED IN POISONINGS</b>	
<b>4.1 Non-specific</b>	
charcoal, activated	<b>Powder.</b>
<b>4.2 Specific</b>	
acetylcysteine	<b>Injection:</b> 200 mg/mL in 10-mL ampoule. <b>Oral liquid:</b> 10%: 20%.

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