## Sulfadoxine + pyrimethamine

**Indication**
- Malaria
  - ICD11 code: 1F4Z

**INN**
- Sulfadoxine + pyrimethamine

**Medicine type**
- Chemical agent

**List type**
- Core

**Additional notes**
- For intermittent preventive treatment of malaria in infants

**Formulations**
- Oral > Solid: 250 mg + 12.5 mg tablet (EMLc)

**EML status history**
- First added in 2019 (TRS 1021)

**Sex**
- All

**Age**
- Children (1 month - 12 years)

**Therapeutic alternatives**
- The recommendation is for this specific medicine

**Patent information**
- Patents have expired in most jurisdictions
  - Read more about patents.

**Wikipedia**
- Sulfadoxine + pyrimethamine

**DrugBank**
- Sulfadoxine
  - Pyrimethamine

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## Expert Committee recommendation

The Expert Committee recommended listing of sulfadoxine + pyrimethamine 250 mg + 12.5 mg fixed-dose combination tablet on the core list of the EMLc for the new indication of intermittent preventive treatment (of malaria) in infancy (IPTi) on the basis of demonstrated efficacy and acceptable safety, and in alignment with WHO malaria guideline recommendations. The Expert Committee noted the lack of evidence of the impact of the use of SP-IPTi on antimicrobial resistance, and encouraged further assessment and monitoring in this regard within programme delivery.

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## Background

The application requested listing of sulfadoxine + pyrimethamine fixed-dose combination tablet on the core list of the EMLc for the new indication of intermittent preventive treatment (of malaria) in infancy (IPTi). Sulfadoxine + pyrimethamine 500 mg + 25 mg tablets are currently included on the EML and EMLc for use in combination with artemesunate 50 mg for the curative treatment of malaria.

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## Public health relevance

Malaria is one of the leading causes of illness, death and lost economic productivity globally. In 2017, there were an estimated 219 million malaria cases worldwide, the majority of which occurred in the African region (92%, 200 million cases) (1). Of the 435 000 deaths due to malaria globally in 2017, 266 000 (61%) were in children under 5 years of age.

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## Benefits
The application presented the findings of a pooled analysis of six randomized, placebo-controlled trials in 7930 infants that investigated the efficacy and safety of IPTi with sulfadoxine + pyrimethamine (IPTi-SP) in four African countries with moderate to high transmission of malaria, when administered to infants at the time of routine vaccination according to the WHO Expanded Programme on Immunization (EPI) (2). From the pooled analysis, the combined estimate of protective efficacy of IPTi-SP against clinical malaria in infants aged up to 1 year of age was 30.3% (95% CI 19.8% to 39.4%, p<0.0001). IPTi-SP was also associated with protective efficacy in infants up to 1 year of age for anaemia (21.3% (95% CI 8.3% to 32.5%, p=0.002)), all-cause hospital admissions (22.9% (95% CI 10.0% to 34.0%, p=0.001)), and hospital admissions associated with malaria parasitaemia (38.1% (95% CI 12.5% to 56.2%, p=0.007)).

### Harms

SP for intermittent preventive treatment in infancy is generally well tolerated. Studies showed no evidence of any adverse effects of SP-IPTi on infants’ serological responses to vaccines (e.g. DTP, polio, hepatitis B, Haemophilus influenzae B, yellow fever or measles). A rebound effect in terms of greater susceptibility to malaria after termination of SP-IPTi, although reported in some studies, was not found in the pooled analysis, where the pooled estimate of protective efficacy of IPTi-SP against the potential rebound period was 9.5% (95% CI 0.3% to 17.8%, p=0.044) (2). Surveillance of molecular markers of SP resistance should accompany SP-IPTi, in particular the distribution and prevalence of PfΔhps 540 mutations, which is a surrogate measure of SP efficacy. Use of IPTi-SP is contraindicated in individuals with known hypersensitivity to pyrimethamine, sulfonamides and related compounds and infants receiving a sulfa-based medication for treatment or prophylaxis, including cotrimoxazole (trimethoprim–sulfamethoxazole), which is widely used as prophylaxis against opportunistic infections in HIV-infected infants.

### Additional evidence

A 2011 systematic review of the cost and the cost-effectiveness of malaria interventions found that the median financial cost of IPTi-SP for protecting one person for one year was US$ 0.60 (range US$ 0.48 to US$ 1.08) (3). A study by Conte et al of the cost-effectiveness of IPTi in sub-Saharan Africa found the cost per malaria episode averted for IPTi-SP was very low, US$ 1.36 to US$ 4.03 based on trial specific data (US$ 0.68 to US$ 2.27 on pooled analysis). The authors concluded that IPTi delivered with the EPI was a highly cost-effective intervention against clinical malaria (4).

### Cost / cost effectiveness

No information was provided in the application.

### WHO guidelines

A 2010 WHO policy recommendation on IPTi-SP recommends the coadministration of SP-IPTi with DTP2, DTP3 and measles immunization to infants, through routine EPI in countries in sub-Saharan Africa, in areas with moderate-to-high malaria transmission (i.e. annual entomological inoculation rates ≥ 10), and where parasite resistance to SP is not high – defined as a prevalence of the PfΔhps 540 mutation of ≤ 50% (5). This recommendation was not re-evaluated during the guideline development process for the 2015 WHO Guidelines for the treatment of malaria (3rd edition). The same recommendation is included in the 2015 Guidelines, however the quality of evidence was not formally assessed (6).

### Availability

A paediatric formulation of sulfadoxine + pyrimethamine 250 mg + 12.5 mg is currently under assessment by the WHO Prequalification Programme. The administered dose of IPTi-SP depends on the weight of the child: ■ Children weighing less than 5 kg should be given 125 mg sulfadoxine and 6.25 mg pyrimethamine. ■ Children weighing 5 kg or more should be given 250 mg sulfadoxine and 12.5 mg pyrimethamine.

### Other considerations

The successful implementation of SP-IPTi requires that national malaria control and EPI programmes work together. WHO, working with UNICEF developed an implementation guide which provides the necessary technical and operational information and tools for country-level policy-makers and programme managers to decide on how to include SP-IPTi with immunization services (7).
In areas where SP-IPTi is implemented each child will be given SP three times in their first year of life when they receive routine vaccinations as follows: ■ First SP-IPTi dose (SP-IPTi1) when DTP2/Penta2 (or combo) vaccination is given (i.e. 8-10 weeks of age) ■ Second SP-IPTi dose (SP-IPTi2) when DTP3/Penta3 (or combo) vaccination is given (12-14 weeks of age) ■ Third SP-IPTi dose (SP-IPTi3) at the time of measles vaccination (nine months) The exact timing of the doses may vary according to the national immunization schedule for DTP and measles vaccination.