GUIDELINES ON

MATERNAL, NEWBORN, CHILD AND ADOLESCENT HEALTH

approved by the

WHO GUIDELINES REVIEW COMMITTEE

Recommendations on child health

World Health Organization

Contents

Abbreviations

3TC	lamuvidine
ABC	abacavir sulfate
AIDS	acquired immunodeficiency virus
ART	antiretroviral therapy
ARV	antiretroviral
AZT	zidovudine
BCG	Bacillus Calmette-Guérin
SMC	seasonal malaria chemoprevention
CSOM	chronic supporative otitis media
DTP	diphtheria-tetanus-pertussis
E	ethambutol
EFZ	efavirenz
FTC	emtricitabine
GRC	Guidelines Review Committee
H	isoniazid
HIV	human immunodeficiency virus
IM	intramuscular
IPV	inactivated polio vaccine
MCV	measles-containing vaccine
MDR	multi-drug resistant
mg	milligram
PI	protease inhibitor
NVP	nevirapine
NNRTI	non-nucleotide reverse transcriptase inhibitor
NRTI	nucleotide reverse transcriptase inhibitor
OPV	oral polio vaccine
ORS	oral rehydration solution
PCV	pneumococcus-containing vaccine

PMTCT	prevention of mother-to-child transmission
R	rifampicin
RV	rotavirus vaccine
SAM	severe acute malnutrition
SMC	seasonal malaria chemoprevention
SP	sulfadoxine-pyrimethamine
TB	tuberculosis
TDF	tenofovir
WHO	World Health Organization
WPV	wild poliovirus
Z	pyrazinamide

Introduction

This publication on recommendations related to newborn health is one of four in a series; the others relate to child, adolescent and maternal and perinatal. The documents are meant to respond to the questions:

- What health interventions should the pregnant woman, mother, newborn, child or adolescent receive and when should s/he receive it?
- What health behaviours should a pregnant woman, mother, child or adolescent practise (or not practise)?

The recommendations included are all approved (or in the final stages of approval or publication) by WHO's Guidelines Review Committee (GRC). The process of developing guidelines is documented in WHO's *Handbook for guideline development*[1] and are based on the grading of recommendations, assessment, development and evaluation (GRADE) system.

The GRADE system classifies the strength of a recommendation as "strong" or "conditional".[2] A strong recommendation is one where the desirable effects of adhering to the recommendation outweigh the undesirable effects. A conditional recommendation is one where the desirable effects of adhering to the recommendation probably outweigh the undesirable effects but these trade-offs are not clear.

The system also grades the quality of evidence:

- High: further research is very unlikely to change confidence in the estimate of effect;
- Moderate: further research is likely to have an important impact on confidence in the effect;
- Low: further research is very likely to have an estimate of effect and is likely to change the estimate;
- Very low: any estimate of effect is very uncertain.

Wherever possible, the quality of evidence and strength of each recommendation, as well as the link where it can be found, are included in this publication.

Where no GRC-approved recommendation currently exists for a topic area of importance, a link is provided to existing guidance. In many cases, this guidance is currently being updated.

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[1] *Handbook for guideline development*. Geneva, WHO, 2012.

[2] The *Handbook for guideline development* does not define a "weak" recommendation, although this category is sometimes still used.

Prevent/promote/protect

1. Breastfeeding

Exclusive breastfeeding

- All babies should be exclusively breastfed from birth until 6 months of age. Mothers should be counselled and provided support for exclusive breastfeeding at each postnatal contact.

  (Strong recommendation, moderate quality evidence for neonatal outcomes; six month duration based on previous WHO recommendations and an updated Cochrane review) Source

Continued breastfeeding

- No GRC-approved recommendations currently exist. Guidance on this topic is in the process of being updated. Meanwhile, the guidance in *Essential nutrition actions: improving maternal, newborn, infant and young child health and nutrition*, 2013, may be used.

  Source

Ten steps to successful breastfeeding

- Every facility providing maternity services and care for newborn infants should:
  1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
  2. Train all health care staff in skills necessary to implement this policy.
  3. Inform all pregnant women about the benefits and management of breastfeeding.
  4. Help mothers initiate breastfeeding within a half-hour of birth.
  5. Show mothers how to breastfeed, and how to maintain lactation even if they should be separated from their infants.
  6. Give newborn infants no food or drink other than breast milk unless *medically* indicated.
  7. Practise rooming in – allow mothers and infants to remain together – 24 hours a day.
  8. Encourage breastfeeding on demand.
  9. Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.
  10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

  Source

Acceptable medical reasons for use of breast-milk substitutes

- Nearly all women are able to breastfeed. In rare infant and maternal conditions, formula and/or foods other than breast milk may be required for short- or long-term feeding. (See document on web site for specific conditions.)

  (Recommendations agreed by consensus) Source

2. Complementary feeding

- No GRC-approved recommendations currently exist. Guidance on this topic is in the process of being updated. Meanwhile, the guidance in *Guiding principles for complementary feeding of the breastfed child*, 2003 Source, and *Guiding principles for feeding non-breastfed children 6–24 months of age*, 2005 Source, may be used.

3. Immunization[1]

Bacillus Calmette-Guérin (BCG)

- In settings where tuberculosis is highly endemic or in settings where there is high risk of exposure to tuberculosis a single dose of BCG vaccine should be given to all infants.[2]

  (Strong recommendation, high quality of evidence) Source

Diphtheria

- The primary series of DTwP (whole cell)- or DTaP (acellular)-containing vaccines should be administered in 3 doses, starting as early as 6 weeks of age, and given with a minimum interval of 4 weeks. Where resources permit, additional doses can be given after the completion of the primary series.

  (Strong recommendation, high quality evidence) Source

Haemophilus influenzae type B (HiB)

- Conjugate Hib vaccines should be included in all infant immunization programmes. The age at first dose and the number of primary doses should be set after consideration of the local epidemiology, vaccine presentation and how this fits into the overall routine immunization schedule.

  (Strong recommendation, high quality evidence) Source

Hepatitis A

- WHO recommends that vaccination against hepatitis A be integrated into the national immunization schedule for children aged ≥1 year if indicated on the basis of incidence of acute hepatitis A, change in the endemicity from high to intermediate, and consideration of cost-effectiveness.

  (Strong recommendation, high quality evidence) Source

Hepatitis B

- All infants should receive their first dose of hepatitis B vaccine as soon as possible after birth, preferably within 24 hours.

  (Strong recommendation, moderate quality evidence) Source

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[1] For updated information on all recommended immunizations, see http://www.who.int/immunization/policy/immunization_tables/en/index.html.

[2] For considerations on BCG vaccination for HIV-infected newborns, see http://www.who.int/immunization/wer8221bcg_May07_position_paper.pdf.

- To complete the primary series the birth dose should be followed by two doses, e.g. at the time of the first and third doses of DTP vaccine, or, if programmatically more convenient, by three doses coinciding with DTP or other routine infant vaccinations. Minimum interval between doses is four weeks.

  (Strong recommendation, high quality evidence) Source

Influenza

- Children aged 6–23 months, because of a high burden of severe disease in this group, should be considered a target group for influenza immunization when sufficient resources are available and with due consideration for competing health priorities and operational feasibility.

  (Strong recommendation, high quality evidence) Source

Japanese encephalitis

- Japanese encephalitis immunization should be integrated into Expanded Programmes on Immunization in all areas where Japanese encephalitis constitutes a public health problem.

  (Strong recommendation, high quality evidence) Source

Measles

- Measles vaccines are recommended for all susceptible children and adults for whom measles vaccination is not contraindicated. Where measles transmission is high, the first dose of measles-containing vaccine (MCV1) should be given at 9 months of age, but also to all unvaccinated children over this age. Where transmission is low, MCV1 administration at 12 months of age is preferable.

  (Strong recommendation, high quality evidence) Source

  Where MCV1 is given at 9 months of age, the routine MCV2 should be administered at 15–18 months of age. In countries with very low measles transmission and MCV1 administered at 12 months, the optimal time for routine MCV2 (e.g. between age 15–18 months – school entry) depends on programmatic considerations.

  (Strong recommendation, high quality evidence) Source

  Measles vaccination should be routinely given to potentially susceptible, asymptomatic HIV-infected children and adults.

  (Strong recommendation, very low quality evidence) Source

  In areas where there is a high incidence of both HIV infection and measles, the first dose of MCV may be offered as early as age 6 months. Two additional doses of measles vaccine should be administered to these children according to the national immunization schedule.

  (Strong recommendation, very low quality evidence) Source

Meningococcal vaccines

- WHO recommends that countries with high (>10 cases/100 000 population/year) or intermediate endemic rates (2–10 cases/100 000 population/year) of invasive meningococcal disease and countries with frequent epidemics, introduce appropriate large scale meningococcal vaccination programmes. In countries where the disease occurs less frequently (<2 cases per 100 000 population/year), meningococcal vaccination is recommended for groups at known risk of meningococcal exposure.

  (Strong recommendation, high quality evidence) Source

Pertussis

- All infants, including HIV-positive individuals, should be immunized against pertussis. The first dose should be administered at 6 weeks of age, and subsequent doses given 4–8 weeks apart, at 10–14 and 14–18 weeks of age. The last dose of the primary series should be completed by the age of 6 months. A booster dose is recommended for children 1–6 years of age, preferably during the second year of life.

  (Strong recommendation, high quality evidence) Source

Pneumococcus

- WHO recommends that inclusion of pneumococcus-containing vaccines (PCVs) be given priority in childhood immunization programmes worldwide, especially in countries with under-5 mortality of >50/1000 live births. For administration to infants, three primary doses (3p+0 schedule) or, as an alternative, two primary doses plus a booster (2p+1 schedule) are recommended. Primary vaccination can be initiated as early as at 6 weeks of age.

  (Strong recommendation, high quality evidence) Source

Polio

- The primary series of 3 oral polio vaccine (OPV) vaccinations should be administered according to the schedules of national immunization programmes, for example at 6 weeks, 10 weeks, and 14 weeks, or at 2 months, 4 months, and 6 months. OPV, including a birth dose (known as zero dose because it does not count towards the primary series), is recommended in all polio-endemic countries and in countries at high risk for importation and subsequent spread. The birth dose should be administered at birth, or as soon as possible after birth.

  (Strong recommendation, high quality evidence) Source

  OPV alone, including a birth dose, is recommended in all polio-endemic countries and in countries at high risk for importation and subsequent spread. OPV alone, preferably with a birth dose, is also recommended in all countries with a moderate potential or high potential for wild poliovirus (WPV) transmission, which is reflected by the force of infection. Inactivated polio vaccine (IPV) alone may be considered an alternative to OPV alone (or an IPV–OPV sequential schedule) only in countries that have the lowest risk of both WPV importation and WPV transmission.

  (Strong recommendation, high quality evidence) Source

  Where sequential IPV/OPV is used, WHO recommends that IPV be administered at 2 months of age (e.g. an IPV-OPV-OPV schedule) or at 2 months and 3–4 months of age (e.g. an IPV-IPV-OPV-OPV schedule); in both schedules IPV should be followed by at least 2 doses of OPV. Each dose in the primary series, whether IPV or OPV, should be separated by 4–8 weeks, depending on the risk of exposure to polio in early childhood.

  (Strong recommendation, high quality evidence) Source

Rotavirus

- The first dose of rotavirus vaccine (RV) should be administered as soon as possible after 6 weeks of age. RV1 should be administered in a two-dose schedule at the time of DTP1 and DTP2, and RV5 in a three-dose schedule at the time of the DTP1, DTP2, and DTP3 contacts. Both vaccines are given orally with an interval of at least four weeks between doses. Infants should receive rotavirus vaccine together with DTP regardless of the time of vaccination. Rotavirus vaccination

of healthy children aged over 2 years is not considered necessary. Rotavirus vaccinations can be administered simultaneously with other routine infant vaccines.

(Strong recommendation, high quality evidence) Source

Rubella

- Rubella-containing vaccines are administered subcutaneously or intramuscularly, usually at age 12–15 months, but may be administered to children aged 9–11 months and to older children, adolescents and adults. Although one dose of rubella vaccine probably induces life-long protection, in most countries using the measles-rubella or measles-mumps-rubella vaccines a second dose is offered at 15–18 months or 4–6 years, as indicated for protection against measles and mumps.

  (Strong recommendation, high quality evidence) Source

Tetanus

- WHO recommends that the primary series of three doses of tetanus vaccine should be given in infancy (aged <1 year). Where pertussis is of particular risk to young infants, DTP immunization should be started at age 6 weeks and 2 subsequent doses should be given at intervals of at least 4 weeks (e.g. at weeks 10 and 14).

  (Strong recommendation, high quality evidence) Source

Yellow fever

- Endemic countries should introduce yellow fever vaccine into their routine immunization programmes, giving it to children at age 9–12 months at the same time as the measles vaccine.

  (Strong recommendation, high quality evidence) Source

Vaccinations for HIV-exposed infants and children

- HIV-exposed infants and children and young adults with HIV should receive all vaccines under routine vaccination according to recommended national immunization schedules. Those with more severe immunosuppression may be at higher risk of complications from live vaccines. Inactivated vaccines are more effective among people receiving antiretroviral therapy (ART) and those without immunosuppression, but they are safe and can be used with some efficacy in all groups.

  (No strength, quality) Source

4. Micronutrients

Neonatal vitamin A supplementation

- At the present time, neonatal vitamin A supplementation (that is, supplementation within the first 28 days after birth) is not recommended as a public health intervention to reduce infant morbidity and mortality

  (Strong recommendation, moderate quality evidence for mortality-related outcomes). Source

Vitamin A supplementation in infants 1–5 months of age

- Vitamin A supplementation in infants 1–5 months of age is not recommended as a public health intervention for the reduction of infant morbidity and mortality

  (Strong recommendation, moderate quality evidence for infant mortality and the side-effect of bulging fontanelles and low quality evidence for other critical outcomes) Source

Vitamin A supplementation in infants and children 6-59 months of age

- In settings where vitamin A deficiency is a public health problem, vitamin A supplementation is recommended in infants and children 6–59 months of age as a public health intervention to reduce child morbidity and mortality

  (Strong recommendation, high quality evidence for all-cause mortality, moderate to very low quality for all other critical outcomes, moderate quality for all-cause mortality outcomes in human immunodeficiency virus (HIV)-positive children). Source

Intermittent iron supplementation in preschool or school-age children

- In settings where the prevalence of anaemia in preschool or school-age children is 20% or higher, intermittent use of iron supplements is recommended as a public health intervention to improve iron status and reduce the risk of anaemia among children

  (Strong recommendation, moderate quality evidence for anaemia, low for haemoglobin and ferritin concentrations, very low for iron deficiency; compared with daily supplementation, low quality evidence for anaemia, haemoglobin and ferritin, and very low for iron deficiency) Source

Micronutrient powders for home fortification of foods consumed by infants and children 6–23 months of age

- Home fortification of foods with micronutrient powders containing at least iron, vitamin A and zinc is recommended to improve iron status and reduce anaemia among infants and children 6–23 months of age

  (Strong recommendation, high quality evidence for iron eficiency, moderate quality evidence for anaemia, haemoglobin concentration, iron status and growth) Source

5. Care for development

- No GRC-approved recommendations currently exist. Guidance on this topic is in the process of being updated. Meanwhile, the guidance in *Care for child development: improving the care for young children*, 2012, may be used.

  Source

6. Hygiene[1]

Handwashing

- Promotion of handwashing with soap after defecation and handling of human or animal faeces and before food preparation and eating, along with the provision of soap, are recommended for people with HIV and their households.

  (Strong recommendation, good quality evidence) Source

7. Water & sanitation[1]

Household-based water treatment

- Household-based water treatment methods that are effective in reducing diarrhoea and the storage of water in containers that inhibit manual contact are recommended for people with HIV and their households.

  (Strong recommendation, high quality evidence) Source

Faeces disposal

- Proper disposal of faeces in a toilet, latrine, or at a minimum, buried in the ground is recommended for people with HIV and their households.

  (Strong recommendation, good quality evidence) Source

8. Malaria prevention

Infant chemoprophylaxis

- WHO recommends the co-administration of Sulphadoxine-pyrimethamine (SP) intermittent treatment during infancy (SP-IPTi) with DTP2/Pentavalent 2, DTP3/Pentavalent 3 and measles immunization to infants, through routine immunization programmes in countries in Sub-Saharan Africa, in areas: a. with moderate-to-high malaria transmission (Annual Entomological Inoculation Rates ≥ 10), and b. where parasite resistance to SP is not high – defined as a prevalence of the Pfdhps 540 mutation of ≤ 50%.

  (Strong recommendation, good quality evidence) Source

- Seasonal malaria chemoprevention (SMC) is recommended in areas of highly seasonal malaria transmission across the Sahel sub-region. A complete treatment course of amodiaquine plus sulfadoxine-pyrimethamine (AQ+SP) should be given to children aged between 3 and 59 months at monthly intervals, beginning at the start of the transmission season, to a maximum of four doses during the malaria transmission season (provided both drugs retain sufficient antimalarial efficacy).

  (No strength, no quality of evidence) Source

[1] These recommendations, while formulated for people with HIV, apply to the general population as well.

9. HIV/prevention of mother-to-child transmission (PMTCT)

Antiretroviral (ARV) prophylaxis for newborns

- HIV-exposed infants who are breastfed should receive six weeks of infant prophylaxis with once-daily NVP.

  (Strong recommendation, moderate quality evidence) Source

- HIV-exposed infants who receive replacement feeding should receive four to six weeks of infant prophylaxis with once-daily NVP (or twice-daily AZT).

  (Conditional recommendation, low quality evidence) Source

Prevention of mother-to-child transmission through breastfeeding[1]

- ***In settings where national or sub-national authorities have decided that maternal, newborn and child health services will principally promote and support breastfeeding and ARV interventions*** – Mothers known to be HIV-infected (and whose infants are HIV uninfected or of unknown HIV status) should exclusively breastfeed their infants for the first 6 months of life, introducing appropriate complementary foods thereafter, and continue breastfeeding for the first 12 months of life. Breastfeeding should then only stop once a nutritionally adequate and safe diet without breast milk can be provided.

  (Strong recommendation. high quality evidence for first six months; low quality evidence for recommendation for 12 months) Source

- ***In settings where national or sub-national authorities have decided that maternal, newborn and child health services will principally promote and support breastfeeding and ARV interventions*** – Mothers known to be HIV-infected who decide to stop breastfeeding at any time should stop gradually within one month. Mothers or infants who have been receiving ARV prophylaxis should continue prophylaxis for one week after breastfeeding is fully stopped. Stopping breastfeeding abruptly is not advisable.

  (Strong recommendation, very low quality evidence) Source

- ***In settings where national or sub-national authorities have decided that maternal, newborn and child health services will principally promote and support breastfeeding and ARV interventions*** – When mothers known to be HIV-infected decide to stop breastfeeding at any time, infants should be provided with safe and adequate replacement feeds to enable normal growth and development. Alternatives to breastfeeding include:

  - *For infants less than six months of age:*
    - Commercial infant formula milk as long as home conditions outlined in Recommendation #5 are fulfilled;
    - Expressed, heat-treated breast milk (see Recommendation #6).

  Home-modified animal milk is not recommended as a replacement food in the first six months of life.

  - *For children over six months of age:*
    - Commercial infant formula milk as long as home conditions outlined in Recommendation #5 are fulfilled;

[1] The key principles and recommendations established in 2010 remain valid. *Consolidated guidelines on general HIV care and the use of antiretroviral drugs for treating and preventing HIV infection: recommendations for a public health approach*. Geneva, WHO, 2013.

— Animal milk (boiled for infants under 12 months), as part of a diet providing adequate micronutrient intake;

— Meals, including milk-only feeds, other foods and combination of milk feeds and other foods, should be provided four or five times per day. All children need complementary foods from six months of age.

(Strong recommendation, low quality evidence) Source

- Mothers known to be HIV-infected should only give commercial infant formula milk as a replacement feed to their HIV-uninfected infants or infants who are of unknown HIV status, when specific conditions are met:

a. safe water and sanitation are assured at the household level and in the community; **and**
b. the mother or other caregiver can reliably provide sufficient infant formula milk to support normal growth and development of the infant; **and**
c. the mother or caregiver can prepare it cleanly and frequently enough so that it is safe and carries a low risk of diarrhoea and malnutrition; **and**
d. the mother or caregiver can, in the first six months, exclusively give infant formula milk; and
e. the family is supportive of this practice; **and**
f. the mother or caregiver can access health care that offers comprehensive child health services.

(Strong recommendation, low quality evidence) Source

- Mothers known to be HIV-infected may consider expressing and heat-treating breast milk as an *interim feeding strategy*:

- in special circumstances such as when the infant is born with low birth weight or is otherwise ill in the neonatal period and unable to breastfeed; **or**
- when the mother is unwell and temporarily unable to breastfeed or has a temporary breast health problem such as mastitis; **or**
- to assist mothers to stop breastfeeding; **or**
- if antiretroviral drugs are temporarily not available.

(Weak recommendation, very low quality evidence) Source

- If infants and young children are known to be HIV-infected, mothers are strongly encouraged to exclusively breastfeed for the first six months of life and continue breastfeeding as per the recommendations for the general population, that is, up to two years or beyond.

(Strong recommendation, moderate quality evidence) Source

10. Injury prevention

- No GRC-approved recommendations currently exist. Guidance on this topic is in the process of being updated. Meanwhile, the guidance in *World report on child injury prevention*, 2008, may be used.

Source

11. Non-communicable diseases prevention

Physical activity

- Children and young people aged 5–17 years old should accumulate at least 60 minutes of moderate- to vigorous-intensity physical activity daily. Physical activity of amounts greater than 60 minutes daily will provide additional health benefits. Most of daily physical activity should be aerobic. Vigorous-intensity activities should be incorporated, including those that strengthen muscle and bone, at least three times per week.

  (Strong recommendation, high quality evidence.) Source

Obesity

- No GRC-approved recommendations currently exist. Guidance on this topic is in the process of being updated. Meanwhile, the guidance in *Population-based approaches to obesity prevention*, 2012, may be used.

  Source

Management of child conditions

12. Pneumonia and other respiratory illnesses (e.g. wheezing)

Treatment of non-severe pneumonia with wheeze

- Antibiotics are not routinely recommended for children aged 2–59 months with non-severe pneumonia (i.e. fast breathing with no chest indrawing or danger sign) with a wheeze but no fever (temperature <38 °C), as the cause is most likely to be viral.

  (Strong recommendation, low quality evidence) Source

Antibiotic treatment for non-severe pneumonia with no wheeze

- Children with non-severe pneumonia (i.e. fast breathing with no chest indrawing or danger sign) should be treated with oral amoxicillin. The exception is in patients with HIV:
  - with low HIV prevalence, give amoxicillin at least 40 mg/kg per dose twice daily for 3 days.
  - with high HIV prevalence, give amoxicillin at least 40 mg/kg per dose twice daily for 5 days.

  (Weak recommendation, moderate quality evidence) Source

- Children with non-severe pneumonia who fail on the first line treatment with amoxicillin should have the option of referral to a facility where there is appropriate second line treatment.

  (Weak recommendation, expert opinion) Source

Antibiotic treatment for severe pneumonia

- Children aged 2–59 months with severe pneumonia (chest indrawing) should be treated with oral amoxicillin at least 40 mg/kg per dose twice daily for 5 days.

  (Strong recommendation, moderate quality evidence) Source

- In HIV-infected children, specific guidelines for treatment of severe pneumonia in the context of HIV should be followed.

  (Strong recommendation, low quality evidence) Source

Antibiotic treatment for very severe pneumonia

- Children aged 2–59 months with very severe pneumonia should be treated with parenteral ampicillin (or penicillin) and gentamicin as a first line treatment.
  - Ampicillin: 50 mg/kg, or Benzyl penicillin: 50 000 units per kg IM/IV every 6 hours for at least 5 days
  - Gentamicin: 7.5 mg/kg IM/IV once a day for at least 5 days

  (Strong recommendation, moderate quality evidence) Source

- Ceftriaxone should be used as a second line treatment in children with severe pneumonia with failure on the first line treatment.

  (Strong recommendation, expert opinion) Source

Inhaled salbutamol for treatment of acute wheeze/asthma and bronchoconstriction

- Children with acute wheeze/asthma and bronchoconstriction should be treated with inhaled salbutamol using a metered dose inhaler with spacer devices to relieve bronchoconstriction.

  (Strong recommendation, low quality evidence) Source

- Oral salbutamol should not be used for treatment of acute or persistent wheeze except where inhaled salbutamol is not available. Oral salbutamol is not useful in testing response to bronchodilators.

  (Strong recommendation, low quality evidence) Source

13. Tuberculosis (TB)

Treatment of TB in children

- Given the risk of drug-induced hepatotoxicity, WHO recommends the following dosages of antituberculosis medicines for the treatment of tuberculosis in children:

  isoniazid (H) – 10 mg/kg (range 10–15 mg/kg); maximum dose 300 mg/day
  rifampicin (R) – 15 mg/kg (range 10–20 mg/kg); maximum dose 600 mg/day pyrazinamide (Z) – 35 mg/kg (30–40 mg/kg)
  ethambutol (E) – 20 mg/kg (15–25 mg/kg).

  (Strong recommendation, moderate-quality evidence) Source

- Children living in settings where the prevalence of HIV is high or where resistance to isoniazid is high, or both, with suspected or confirmed pulmonary TB or peripheral lymphadenitis; or children with extensive pulmonary disease living in settings of low HIV prevalence or low isoniazid resistance, should be treated with a four-drug regimen (HRZE) for 2 months followed by a two-drug regimen (HR) for 4 months at the following dosages:

  isoniazid (H) – 10 mg/kg (range 10–15 mg/kg); maximum dose 300 mg/day
  rifampicin (R) – 15 mg/kg (range 10–20 mg/kg); maximum dose: 600 mg/day
  pyrazinamide (Z) – 35 mg/kg (30–40 mg/kg)
  ethambutol (E) – 20 mg/kg (15–25 mg/kg).

  (Strong recommendation, moderate quality evidence) Source

- Children with suspected or confirmed pulmonary TB or tuberculous peripheral lymphadenitis who live in settings with low HIV prevalence or low resistance to isoniazid and children who are HIV-negative can be treated with a three-drug regimen (HRZ) for 2 months followed by a two-drug (HR) regimen for 4 months at the following dosages:

  isoniazid (H) – 10 mg/kg (range 10–15 mg/kg); maximum dose 300 mg/day
  rifampicin (R) – 15 mg/kg (range 10–20 mg/kg); maximum dose 600 mg/day
  pyrazinamide (Z) – 35 mg/kg (30–40 mg/kg)

  (Strong recommendation, moderate quality evidence) Source

- Children with suspected or confirmed pulmonary tuberculosis or tuberculous peripheral lymphadenitis living in settings with a high HIV prevalence (or with confirmed HIV infection) should not be treated with intermittent regimens (that is, twice-weekly or thrice-weekly doses).

  (Strong recommendation, low-to-moderate-quality evidence against the use of intermittent treatment in children) Source

- During the continuation phase of treatment, thrice-weekly regimens can be considered for children known to be HIV-uninfected and living in settings with well-established directly-observed therapy (DOT).

  (Conditional recommendation, very low quality evidence for use of intermittent treatment in children in specific settings) Source

- Infants (aged 0–3 months) with suspected or confirmed pulmonary TB or tuberculous peripheral lymphadenitis should be promptly treated with the standard treatment regimens, as described above. Treatment may require dose adjustment to reconcile the effect of age and possible toxicity in young infants. The decision to adjust doses should be taken by a clinician experienced in managing paediatric TB.

  (Strong recommendation, low quality evidence) Source

- Streptomycin should not be used as part of first-line treatment regimens for children with pulmonary TB or tuberculous peripheral lymphadenitis.

  (Strong recommendation, moderate quality evidence) Source

- Children with suspected or confirmed tuberculous meningitis should be treated with a four-drug regimen (HRZE) for 2 months, followed by a two-drug regimen (HR) for 10 months; the total duration of treatment being 12 months. The doses recommended for the treatment of tuberculous meningitis are the same as those described for pulmonary tuberculosis.

  (Strong recommendation, very low-quality evidence) Source

- Children with suspected or confirmed osteoarticular tuberculosis should be treated with a four-drug regimen (HRZE) for 2 months followed by a two-drug regimen (HR) for 10 months; the total duration of treatment being 12 months. The doses recommended for the treatment of osteoarticular tuberculosis are the same as those described for pulmonary tuberculosis.

  (Strong recommendation, low quality evidence) Source

- Children with proven or suspected pulmonary tuberculosis or tuberculous meningitis caused by multiple drug-resistant bacilli can be treated with a fluoroquinolone in the context of a well-functioning MDR-TB control programme and within an appropriate MDR-TB regimen. The decision to treat should be taken by a clinician experienced in managing paediatric tuberculosis.

  (Strong recommendation, very low quality evidence) Source

14. Diarrhoea

The recommendations for managing diarrhoea in HIV-uninfected infants and children are the same as those for management in HIV-infected infants and children.

Prevention of diarrhoea

- Vitamin A supplementation is recommended for all HIV-infected and -exposed infants and children aged 6 months to 5 years, in doses given every 6 months (100 000 IU for those aged 6–12 months and 200 000 IU for those aged > 12 months).

  (Strong recommendation; low quality evidence) Source

Oral rehydration solution

- Low-osmolarity ORS is recommended for the treatment of dehydration, or intravenous electrolyte solution in cases of severe dehydration, in HIV-infected and -exposed infants and children with diarrhoea.

  (Strong recommendation, high quality evidence) Source

Zinc

- Elemental zinc supplementation for 10–14 days is recommended, with increased fluids and continued feeding, for all HIV-infected and -exposed children with diarrhoea, at 10 mg/day for infants < 6 months of age and 20 mg/day for infants and children > 6 months.

  (Strong recommendation, high quality evidence) Source

Antibiotics for treatment of dysentery

- Children with diarrhoea and blood in stool (i.e. dysentery) should be treated with ciprofloxacin as a first line treatment. Ceftriaxone should be given as a second line treatment in severely ill children where local antimicrobial sensitivity is not known.
  - Ciprofloxacin: 15 mg/kg/dose twice daily for 3 days
  - Ceftriaxone: 50–80 mg/kg daily for 3 days.

  (Strong recommendation, low quality evidence) Source

- Where local antimicrobial sensitivity is known, local guidelines should be followed.

  (Strong recommendation, low quality evidence) Source

15. Fever conditions

Malaria

Malaria diagnosis

- Prompt parasitological confirmation by microscopy or alternatively by rapid diagnostic tests is recommended in all patients suspected of malaria before treatment is started. Treatment solely on the basis of clinical suspicion should only be considered when a parasitological diagnosis is not accessible.

  (No strength, quality of evidence) Source

Treatment of uncomplicated *P. falciparum* malaria

- Artemisinin-combination therapies (ACTs) should be used as first-line treatment for infants and young children with uncomplicated malaria, and careful attention should be paid to accurate dosing and ensuring the administered dose is retained. Referral to a health centre or hospital is indicated for young children who cannot swallow antimalarial medicines reliably. If referral is expected to take more than six hours, pre-referral treatment with rectal artesunate is indicated.

  (Strong recommendation, high quality evidence) Source

Pre-referral treatment for severe *P. falciparum* malaria

- If complete treatment for severe malaria below is not possible, patients with severe malaria should be given pre-referral treatment and referred immediately to an appropriate facility for further treatment. The following options for pre-referral treatment are recommended: rectal artesunate, quinine IM, artesunate IM, and artemether IM. In young children of less than 5 years of age, the use of rectal artesunate (10 mg/kg) has been shown to reduce the risk of death and permanent disability.

  (No strength, no quality of evidence) Source

Treatment of severe *P. falciparum* malaria

- Intravenous artesunate should be used in preference to quinine for the treatment of severe *P. falciparum* malaria in children.

  (Strong recommendation, high quality evidence) Source

Ear problems

Antibiotics for treatment of acute otitis media

- Children with acute otitis media should be treated with oral amoxicillin at 40 mg/ kg twice per day for 7–10 days.

  (Strong recommendation, low quality evidence) Source

- Where pathogens causing acute otitis media are known to be sensitive to co-trimoxazole, this antibiotic could be used as an alternative given twice per day for 7–10 days.

  (Strong recommendation, low quality evidence) Source

Antibiotics for treatment of chronic suppurative otitis media (CSOM)

- Children with CSOM should, in addition to aural toilet by dry wicking, be treated with instillation of drops containing quinolones (such as ciprofloxacin, norfloxacin, ofloxacin) three times daily for two weeks.

  (Strong recommendation, low quality evidence) Source

- Children who fail to respond to treatment should be referred for further evaluation for other causes of CSOM, especially tuberculosis.

  (Strong recommendation, expert opinion) Source

Topical antiseptics for treatment of CSOM

- Topical antiseptics and steroids should not be used for the treatment of CSOM in children.

  (Strong recommendation, low quality evidence) Source

Topical steroids for treatment of CSOM

- Topical steroids should not be used in treating CSOM.

  (Weak recommendation, very low quality evidence) Source

Dengue

- No GRC-approved recommendations currently exist. Guidance on this topic is in the process of being updated. Meanwhile, the guidance in *Dengue: guidelines for diagnosis, treatment and control*, 2009, may be used.

  Source

Acute bacterial meningitis

Antibiotics for treatment of acute bacterial meningitis

- Children with acute bacterial meningitis should be treated empirically with 3rd generation cephalosporins.

  — Ceftriaxone: 50 mg/kg per dose IV every 12 hours or 100 mg/kg once daily, or
  — Cefotaxime: 50 mg/kg per dose every 6 hours for 10–14 days.

  (Strong recommendation, moderate quality evidence) Source

- Where it is known that there is no significant resistance to chloramphenicol and beta lactam antibiotics among bacteria-causing meningitis follow national guidelines or choose any of the following two regimens:

  — Chloramphenicol: 25 mg/kg IM (or IV) every 6 hours plus ampicillin: 50 mg/ kg IM (or IV) every 6 hours

  OR

  — Chloramphenicol: 25 mg/kg IM (or IV) every 6 hours plus benzyl penicillin: 60 mg/kg (100 000 units/kg) every 6 hours IM (or IV).

  (Conditional recommendation, moderate quality evidence) Source

Measles

- No GRC-approved recommendations currently exist. Guidance on this topic is in the process of being updated. Meanwhile, the guidance in *Treating measles in children*, updated, 2004, may be used.

  Source

Septicaemia

- No GRC-approved recommendations currently exist. Guidance on this topic is in the process of being updated.

Typhoid fever

Antibiotics for treatment of typhoid fever

- Children with typhoid fever should be treated with a fluoroquinolone (i.e. Ciprofloxacin, Gatifloxacin, Ofloxacin, and Perfloxacin) as a first line treatment for 7–10 days.

  — Ciprofloxacin: orally 15 mg/kg/dose twice daily for 7–10 days.

  (Strong recommendation, moderate quality evidence) Source

- If the response to treatment is poor, consider drug-resistant typhoid, and treat with a second line antibiotic like 3rd generation cephalosporins or azithromycin.

  — Cetriaxone (IV): 80 mg/kg per day for 5–7 days,

  OR

  — Azithromycin: 20 mg/kg per day for 5–7 days.

  (Strong recommendation, moderate quality evidence) Source

- Where drug resistance to antibiotics among salmonella isolates is known, follow the national guidelines according to local susceptibility data.

  (Strong recommendation, moderate quality evidence) Source

16. Malnutrition

Severe acute malnutrition (SAM)

Criteria for identifying children with SAM for treatment

- In the context of early identification of children with SAM, trained community health workers and community members should measure the mid-upper arm circumference of infants and children 6–59 months of age and examine them for bilateral pitting oedema. Infants and children 6–59 months of age who have a mid-upper arm circumference less than 115 mm or who have any degree of bilateral oedema should be immediately referred for full assessment at a treatment centre for the management of SAM.

  (Strong recommendation, low quality evidence) Source

- In primary health care facilities and hospitals, health workers should assess the mid-upper arm circumference or the weight-for-height/length status of infants and children 6–59 months of age and also examine them for bilateral oedema. Infants and children 6– 59 months of age who have a mid-upper arm circumference less than 115 mm or a weight-for-height/length less than -3 Z-scores of the WHO growth standards or who have bilateral oedema should be immediately admitted to a programme for the management of SAM.

  (Strong recommendation, low quality evidence) Source

Criteria for inpatient or outpatient care[1]

- Children with the above indications of SAM should first be assessed with a full clinical examination to confirm whether they have medical complications and whether they have an appetite. Children who have appetite and are clinically well and alert should be treated as outpatients. Children who have medical complications, severe oedema or poor appetite or

[1] Necessary resources and services need to be in place if children are referred to outpatient care.

present with one or more Integrated Management of Childhood Illness danger signs[1] should be treated as inpatients.

(Strong recommendation, low quality evidence) Source

Criteria for transferring children from inpatient to outpatient care

- Children with SAM who are admitted to hospital can be transferred to outpatient care when their medical complications, including oedema, are resolving and they have good appetite and are clinically well and alert. The decision to transfer children from inpatient to outpatient care should not be determined by achieving specific anthropometric outcomes such as a specific mid upper-arm circumference or weight-for-height/length.

  (Strong recommendation, low quality evidence) Source

Criteria for discharging children from treatment

- Children with SAM should only be discharged from treatment when: their weight-for-height/length is at least equal or higher than -2 Z-scores and they have had no oedema for at least 2 weeks; or mid-upper-arm circumference is equal or more than 125 mm and they have had no oedema for at least 2 weeks.

  (Strong recommendation, low quality evidence) Source

- The same anthropometric indicator that is used to confirm SAM should also be used to assess if a child has reached nutritional recovery, i.e. if mid-upper arm circumference is used to identify that a child has SAM then mid-upper arm circumference should be used to assess and confirm nutritional recovery. Similarly, if weight-for-height is used to identify that a child has SAM then weight-for-height should be used to assess and confirm nutritional recovery.

  (Strong recommendation, low quality evidence) Source

- Children admitted with only bilateral pitting oedema should be discharged from treatment based on whichever anthropometric indicator (mid-upper arm circumference or weight-for-height) is routinely used in programmes.

  (Strong recommendation, low quality evidence) Source

- Percentage weight gain should not be used as a discharge criterion.

  (Strong recommendation, low quality evidence) Source

Follow-up of infants and children after discharge from treatment for SAM

- Children with SAM who are discharged from treatment programmes should be periodically monitored to avoid a relapse.

  (Strong recommendation, low quality evidence) Source

Where to manage children with SAM who have oedema

- Children with SAM who have severe bilateral oedema, even if they present with no medical complications and have appetite, should be admitted for inpatient care.

  (Strong recommendation, very low quality evidence) Source

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[1] Danger signs: unable to drink or breastfeed; vomits everything; has had convulsions (more than one or prolonged > 15 min.); lethargic or unconscious; convulsing now.

Use of antibiotics in the management of children with SAM in outpatient care

- Children with uncomplicated SAM not requiring to be admitted and who are managed as outpatients should be given a course of oral antibiotic such as amoxicillin or another broad spectrum antibiotic.

  (Conditional recommendation, moderate quality evidence from randomized trial and very low quality evidence from non-randomized studies) Source

- Children who are undernourished but who do not have severe acute malnutrition should not routinely receive antibiotics unless they show signs of clinical infection.

  (Strong recommendation, moderate quality evidence from randomized trial and very low quality evidence from non-randomized studies) Source

Vitamin A supplementation in the treatment of children with SAM

- Children with SAM should receive the recommended nutrient intake of vitamin A throughout the treatment period. Children with severe acute malnutrition should daily be provided with about 5000 IU vitamin A either as an integral part of therapeutic foods or as part of a multi-micronutrient formulation.

  (Strong recommendation, low quality evidence) Source

- Children with SAM do not require a high dose of vitamin A as a supplement if they are receiving F75, F100[1] or RUTF that complies with WHO specifications (and therefore already contains sufficient vitamin A), or vitamin A is part of other daily supplements.

  (Strong recommendation, low quality evidence) Source

- Children with SAM should be given a high dose of vitamin A (50 000 IU, 100 000 IU or 200 000 IU depending on age) on admission only if they are given therapeutic foods that are not fortified as recommended in WHO specifications and vitamin A is not part of other daily supplements.

  (Strong recommendation, low quality evidence) Source

Therapeutic feeding approaches in the management of SAM in children 6-59 months

- Children with SAM who present with either acute or persistent diarrhoea can be given ready-to-use therapeutic food in the same way as children without diarrhoea, whether they are being managed as inpatients or outpatients.

  (Strong recommendation, very low quality evidence) Source

- *In inpatient settings where ready-to-use therapeutic food is provided as the therapeutic food in the rehabilitation phase (following F-75 in stabilization phase)*: Once children are stabilized, have appetite and reduced oedema and are therefore ready to move into the rehabilitation phase, they should transition from F-75 to ready-to-use therapeutic food over 2–3 days, as tolerated. The recommended energy intake during this period is between 100–135 kcal/kg per day. The optimal approach for achieving this is not known and may depend on the number and skills of staff available to supervise feeding and monitor the children during rehabilitation. Two options for transitioning children from F-75 to ready-to use therapeutic food are suggested:

  - Start feeding by giving ready-to-use therapeutic food as prescribed for the transition phase. Let the child drink water freely. If the child does not take the prescribed amount of ready-

[1] F-75 and F-100 are formula diets used for the management of children with severe acute malnutrition in inpatient care. F-75 (75 kcal or 315kJ/100 ml) is used during the initial phase of treatment, while F-100 (100kcal or 420kJ/ 100 ml) is used during the rehabilitation phase.

to-use therapeutic food, then top up the feed with F-75. Increase the amount of ready-to-use therapeutic food over 2-3 days until the child takes the full requirement of ready-to-use therapeutic food.

or,

- Give the child the prescribed amount of ready-to-use therapeutic food for the transition phase. Let the child drink water freely. If the child does not take at least half the prescribed amount of ready-to-use therapeutic food in the first 12 hours then stop giving the ready-to-use therapeutic food and give F-75 again. Retry the same approach after another one to two days until the child takes the appropriate amount of ready-to-use therapeutic food to meet energy needs. (Strong recommendation, very low quality evidence) Guideline: updates on the management of severe acute malnutrition in infants and children, 2013

- *In inpatient settings where F-100 is provided as the therapeutic food in the rehabilitation phase*: Children who have been admitted with complicated severe acute malnutrition and are achieving rapid weight gain on F-100 should be changed to ready-to-use therapeutic food and observed that they accept the diet before being transferred to an outpatient programme.

  (Strong recommendation, very low quality evidence) Source

Fluid management of children with SAM

- Children with SAM who present with some dehydration or severe dehydration **but who are not shocked** should be rehydrated slowly, either orally or by nasogastric tube, using ORS for malnourished children (5–10 ml/kg per hour up to a maximum of 12 hours).

  (Strong recommendation, low quality evidence) Source

- Full strength, standard WHO low osmolarity ORS (75 mmol/L of sodium) should not be used for oral or nasogastric rehydration in children with severe acute malnutrition. Give either ReSoMal[1] or half strength standard WHO low osmolarity oral rehydration solution with added potassium and glucose, unless the child has cholera or profuse watery diarrhoea.

  (Strong recommendation, low quality evidence) Source

- ReSoMal (or locally prepared ReSoMal using standard WHO low osmolarity ORS) should not be given if children are suspected of having cholera or have profuse watery diarrhoea.[2] Such children should be given standard WHO low osmolarity ORS that is normally made i.e. not further diluted.

  (Strong recommendation, low quality evidence) Source

- Children with SAM **and signs of shock or severe dehydration** and who cannot be rehydrated orally or by nasogastric tube should be treated with intravenous fluids, either:

  — half-strength Darrow's solution with 5% dextrose, or
  — Ringer's Lactate solution with 5% dextrose.

  If neither is available, 0.45% saline + 5% dextrose should be used.

  (Conditional recommendation, very low quality evidence) Source

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[1] ReSoMal is a powder for the preparation of an ORS exclusively for oral or nasogastric rehydration of people suffering from severe acute malnutrition. It must be used exclusively under medical supervision in inpatient care, and must not be given for free use to the mother or carer.

[2] Three or more loose or watery stools in a day, for more than fourteen days.

Management of HIV-infected children with SAM

- Children with SAM who are HIV infected and who qualify for lifelong ART should be started on ART as soon as possible after stabilization of metabolic complications and sepsis. This would be indicated by return of appetite and resolution of severe oedema. HIV-infected children with SAM should be given the same ART regimens, in the same doses, as children with HIV who do not have SAM. HIV-infected children with SAM who are started on ART should be monitored closely (inpatient and outpatient) in the first six to eight weeks following initiation of ART to identify early metabolic complications and opportunistic infections.

  (Strong recommendation, very low quality evidence) Source

- Children with SAM who are HIV infected should be managed with the same therapeutic feeding approaches as children with SAM who are HIV uninfected.

  (Strong recommendation, very low quality evidence) Source

- HIV-infected children with SAM should receive a high dose of vitamin A on admission (50 000 IU to 200 000 IU depending on age) and zinc for management of diarrhoea as indicated for other children with SAM, unless they are already receiving F75, F100 or RUTF which contain adequate vitamin A and zinc if they are fortified following the WHO specifications.

  (Strong recommendation, very low quality evidence) Source

- HIV-infected children with SAM in whom persistent diarrhoea does not resolve with standard management should be investigated to exclude carbohydrate intolerance and infective causes that may require different management, such as modification of fluid and feed intake, or antibiotics.

  (Strong recommendation, very low quality evidence) Source

Identifying and managing infants less than 6 months of age with SAM

- Infants less than 6 months of age with SAM with any of the following complicating factors should be admitted for inpatient care:

  a. Any serious clinical condition or medical complication as outlined for infants 6 months of age or older with SAM.
  b. Recent weight loss or failure to gain weight.
  c. Ineffective feeding (attachment, positioning and suckling) directly observed for 15-20 minutes, ideally in a supervised separated area.
  d. Any pitting oedema.
  e. Any medical or social issue needing more detailed assessment or intensive support (e.g. disability, depression of caretaker, or other adverse social circumstances).

  (Strong recommendation, very low quality evidence) Source

- Infants less than 6 months of age with SAM should receive the same general medical care as infants with SAM who are 6 months of age or older:

  a. Infants with SAM who are admitted for inpatient care should be given parenteral antibiotics to treat possible sepsis and appropriate treatment for other medical complications such as TB, HIV, surgical conditions or disability;
  b. Infants with SAM who are not admitted should receive a course of broad spectrum oral antibiotics, such as amoxicillin, in an appropriately weight-adjusted dose.

  (Strong recommendation, very low quality evidence) Source

- Feeding approaches of infants less than 6 months of age with SAM should prioritize establishing, or re-establishing, effective exclusive breastfeeding by the mother or other caregiver.

  (Strong recommendation, very low quality evidence) Source

- Infants less than 6 months of age with SAM who are admitted:

  a. Should be breastfed where possible and the mothers or female caregivers should be supported to breastfeed the infants. If an infant is not breastfed, support should be given to the mother or female caregiver to re-lactate. If this is not possible wet-nursing[1] should be encouraged.
  b. Should be provided a supplementary feed:
     i. Supplementary suckling approaches should, where feasible, be prioritized;
     ii. For infants with SAM but no oedema, expressed breast milk should be given, and where this is not possible, commercial (generic) infant formula or F-75 or diluted F-100[2] may be given either alone or as the supplementary feed together with breast milk;
     iii. For infants with SAM and oedema, infant formula or F-75 should be given as a supplement to breast milk.
  c. Should not be given undiluted F-100 at any time (*due to the high renal solute load and risk of hypernatraemic dehydration*).
  d. If there is no realistic prospect of being breastfed, should be given appropriate replacement feeds such as commercial (generic) infant formula with relevant support to enable safe preparation and use, including at home when discharged;
  e. Assessment of physical and mental health status of mothers or caretakers should be promoted and relevant treatment or support provided.

  (Strong recommendation, very low quality evidence) Source

- Infants less than 6 months of age who were admitted to inpatient care can be transferred to outpatient care when:

  a. All clinical conditions or medical complications including oedema are resolved, and
  b. The infant has good appetite, is clinically well and alert, and
  c. Weight gain on either exclusive breastfeeding or replacement feeding is satisfactory e.g. above the median of the WHO growth velocity standards or more than 5 gm/kg per day for at least 3 successive days, and
  d. The infant has been checked for immunizations and other routine interventions, and
  e. The mothers or caregivers are linked with needed community-based follow-up and support.

  (Strong recommendation, very low quality evidence) Source

- Infants less than 6 months of age can be discharged from all care when they:

  a. Are breastfeeding effectively or feeding well with replacement feeds, and
  b. Have adequate weight gain, and
  c. Have a weight-for-length equal or higher than -2 z-scores.

  (Strong recommendation, very low quality evidence) Source

- For infants less than 6 months of age with SAM who do not require inpatient care or whose caretakers decline admission for assessment and treatment:

  a. Counselling and support for optimal infant and young child feeding should be provided based on general infant and young child feeding recommendations including for low-birth-weight infants.

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[1] All potential wet-nurses should be tested for HIV.
[2] Prepared F-100 should be further diluted by adding 30% water.

b. Weight gain of the infant should be monitored weekly to observe changes;
c. If the infant does not gain weight, or loses weight while the mother or caregiver is receiving support for breastfeeding, then infants should be referred to inpatient care;
d. Assessment of physical and mental health status of mothers or caretakers should be promoted and relevant treatment or support provided.

(Strong recommendation, very low quality evidence) Source

Antibiotics in management of SAM

- In children with SAM without complications, manage according to the current community case management guidelines.

  (Weak recommendation, expert opinion) Source

- In children with SAM with complications, give parenteral antibiotics as follows:

  — Benzyl penicillin: 50 000 U/kg IM/IV every 6 hours, or ampicillin: 50 mg/kg IM/IV every 6 hours for 2 days, then oral amoxicillin: 15 mg/kg per dose every 8 hours for 5 days.

  AND

  — Gentamicin: 7.5 mg/kg IM/IV once daily for 7 days.

  (Weak recommendation, low quality evidence) Source

Moderate acute malnutrition

- Management of moderate acute malnutrition in children 6–59 months of age should include actions such as breastfeeding promotion and support, education and nutrition counselling for families, and other activities that identify and prevent the underlying causes of malnutrition, including nutrition insecurity. Interventions to improve food security include the provision of conditional or non-conditional cash transfers and support to agriculture, such as crop diversification.

  (No strength, no quality of evidence) Source

- Children 6–59 months of age with moderate acute malnutrition need to receive nutrient-dense foods to meet their extra needs for weight and height gain and functional recovery.

  (No strength, no quality of evidence) Source

17. HIV/AIDS

Establishing a diagnosis of HIV infection in infants and children

- In all epidemic contexts, HIV testing should be offered to all infants and children born to HIV-positive women and children from families where another sibling or parent has HIV. In addition, in generalized epidemics all children attending clinical services (including immunization clinics) should be tested. In concentrated epidemics testing is recommended as part of the standard of care for all infants and children who present with signs that could indicate HIV infection, including e.g. children receiving TB services and children treated for malnutrition.

  (Strong recommendation, high quality evidence) Source

- All infants with unknown or uncertain HIV exposure being seen in health care facilities at or around birth or at the first postnatal visit (usually four to six weeks), or other child health visit, should have their HIV exposure status ascertained.

  (Strong recommendation, high quality evidence). Source

- All HIV-exposed infants should have HIV virological testing at four to six weeks of age or at the earliest opportunity thereafter.

  (Strong recommendation, high quality evidence) Source

Disclosure

- Children of school age should be told their HIV-positive status and their parents or caregiver's status; younger children should be told their status incrementally to accommodate their cognitive skills and emotional maturity, in preparation for full disclosure.

  (Strong recommendation, low quality evidence) Source

When to start ART in children

- ART should be initiated in all children infected with HIV below five years of age, regardless of CD4 count or WHO clinical stage:

  - infants diagnosed in the first year of life

  (Strong recommendation, moderate quality evidence);

  - children infected with HIV between one and below five years of age

  (Conditional recommendation, very low quality evidence).

  Source

- ART should be initiated in all children infected with HIV five years of age and older with CD4 cell count ≤500 cells/mm^3, regardless of WHO clinical stage:

  - CD4 count ≤350 cells/mm^3

  (Strong recommendation, moderate quality evidence);

  - CD4 count between 350 and 500 cells/mm^3

  (Conditional recommendation, very low quality evidence).

  Source

- ART should be initiated in all children infected with HIV with severe or advanced symptomatic disease (WHO clinical stage 3 or 4) regardless of age and CD4 count.

  (Strong recommendation, moderate quality evidence) Source

- ART should be initiated in any child younger than 18 months of age who has been given a presumptive clinical diagnosis of HIV infection.

  (Strong recommendation, low quality evidence) Source

First-line ART for children younger than three years of age

- A lopinavir/ritonavir (LPV/r)-based regimen should be used as first-line ART for all HIV-infected children younger than three years (36 months) of age, regardless of NNRTI exposure. If LPV/r is not feasible, treatment should be initiated with an NVP-based regimen.

  (Strong recommendation, moderate quality evidence). Source

- Where viral load monitoring is available, consideration can be given to substituting LPV/r with an NNRTI after virological suppression is sustained.

  (Conditional recommendation, low quality evidence) Source

- In HIV-infected infants and children younger than three years, ABC + 3TC + AZT is recommended as an option for children who develop TB while on an ART regimen containing NVP or LPV/r. Once TB therapy has been completed, this regimen should be stopped and the initial regimen should be restarted.

  (Strong recommendation, moderate quality evidence). Source

- For HIV-infected infants and children younger than three years, the NRTI backbone for an ART regimen should be ABC or AZT + 3TC.

  (Strong recommendation, low quality evidence). Source

First-line ART for children three years and older (including adolescents)

- For children infected with HIV three years and older, EFV is the preferred NNRTI for first-line treatment and NVP is the alternative.

  (Strong recommendation, low quality evidence) Source

- For children infected with HIV three years and older to less than 10 years old (or less than 35 kg), the NRTI backbone for an ART regimen should be one of the following, in preferential order:

  - ABC + 3TC
  - AZT or TDF + 3TC or FTC

  (Conditional recommendation, low quality evidence) Source

Monitoring the response to ART and the diagnosis of treatment failure in adults and children

- Viral load is recommended as the preferred monitoring approach to diagnose and confirm ARV treatment failure.

  (Strong recommendation, low quality evidence). Source

- If viral load is not routinely available, CD4 count and clinical monitoring should be used to diagnose treatment failure.

  (Strong recommendation, moderate quality evidence). Source

Second-line ART for children

- After failure of a first-line NNRTI-based regimen, a boosted protease inhibitor (PI) plus two NRTIs are recommended for second-line ART; LPV/r is the preferred boosted PI.

  (Strong recommendation, moderate quality evidence) Source

- After failure of a first-line LPV/r-based regimen, children younger than 3 years should remain on their first-line regimen, and measures to improve adherence should be undertaken.

  (Conditional recommendation, very low quality evidence) Source

- After failure of a first-line LPV/r-based regimen, children 3 years or older should switch to a second-line regimen containing an NNRTI plus two NRTIs; EFV is the preferred NNRTI.

  (Conditional recommendation, low quality evidence) Source

- After failure of a first-line regimen of ABC or TDF + 3TC (or FTC), the preferred NRTI backbone option for second-line ART is AZT + 3TC.

  (Strong recommendation, low quality evidence) Source

- After failure of a first-line regimen containing AZT or d4T + 3TC (or FTC), the preferred NRTI backbone option for second-line ART is ABC or TDF + 3TC (or FTC).

  (Strong recommendation, low quality evidence) Source

Co-trimoxazole treatment for suspected *Pneumocystis jirovecii* pneumonia

- Empirical co-trimoxazole treatment for suspected *Pneumocystis jirovecii* (previously *Pneumocystis carinii*) pneumonia (PCP) is recommended as an additional treatment for HIV-infected and -exposed infants aged from 2 months up to 1 year with severe or very severe pneumonia.

  (Strong recommendation, moderate quality evidence) Source

- Empirical co-trimoxazole treatment for PCP is not recommended for HIV-infected and -exposed children over 1 year of age with severe or very severe pneumonia.

  (Conditional recommendation, moderate quality evidence) Source

Antibiotic regimens for severe and very severe pneumonia

- Ampicillin (or penicillin when ampicillin is not available) plus gentamicin or ceftriaxone are recommended as first-line antibiotic treatment for HIV-infected and -exposed infants and children under 5 years of age with severe or very severe pneumonia.

  (Conditional recommendation, low quality evidence) Source

- For HIV-infected and -exposed infants and children with severe or very severe pneumonia who fail treatment while on ampicillin or penicillin plus gentamicin, ceftriaxone alone should be used as second-line treatment.

  (Conditional recommendation, low quality evidence) Source

Bloody diarrhoea

- Ciprofloxacin for 3 days at an oral dose of 15 mg/kg is recommended for treating bloody diarrhoea in all HIV-infected and -exposed infants and children.

  (Strong recommendation, moderate quality evidence) Source

Persistent diarrhoea

- Daily multiple micronutrients for 2 weeks are recommended for all HIV-infected and -exposed infants and children with persistent diarrhoea.

  (Conditional recommendation, low quality of evidence) Source

Nutritional care of HIV-infected children

- Infants and children should undergo initial nutritional assessment (evaluation of nutritional status, diet and symptoms) and then be weighed and have height measured at each visit and monitored with reference to WHO or national growth curves. Growth monitoring should also be integrated into the assessment of ART response.

  (No strength, quality of evidence). Source

- Children living with HIV should be assessed, classified and managed according to a nutrition care plan to cover their nutrient needs associated with the presence of HIV and nutritional status and to ensure appropriate growth and development.

  (No strength, quality of evidence) Source

18. Development disorders

- No GRC-approved recommendations currently exist. Guidance on this topic is in the process of being updated.

19. Seizure disorder (epilepsy)

- No GRC-approved recommendations currently exist. Guidance on this topic is in the process of being updated.

20. Supportive care

Use and delivery of oxygen therapy

Pulse oximetry for detection of hypoxaemia

- Pulse oximetry is recommended to determine the presence of hypoxaemia and to guide administration of oxygen therapy in infants and children with hypoxaemia.

  (Strong recommendation, low quality evidence) Source

Clinical signs for detection of hypoxaemia in children

- Use pulse oximetry wherever possible for the detection of hypoxaemia in children with severe, lower respiratory infections. If oximetry is not available, then the following clinical signs could be used to guide the need for oxygen therapy:

  — central cyanosis
  — nasal flaring
  — inability to drink or feed (where this is due to respiratory distress)
  — grunting with every breath
  — depressed mental state (i.e. drowsy, lethargic).

  (Strong recommendation, low quality evidence) Source

- In some situations and depending on the overall clinical condition, children with the following less-specific signs may also need oxygen:
  - severe lower chest wall indrawing
  - respiratory rate of 70/min or above
  - head nodding.

  (Strong recommendation, very low quality evidence) Source

Oxygen therapy in treatment of hypoxaemia

- Children with hypoxaemia should receive appropriate oxygen therapy.

  (Strong recommendation, low quality evidence) Source

- Effective oxygen delivery systems should be a universal standard of care, and should be made more widely available.

  (Strong recommendation, expert opinion) Source

Thresholds for administering oxygen therapy

- Administering oxygen therapy should be guided by pulse oximetry where available and thresholds for giving oxygen may vary depending on the altitude.

  (Strong recommendation, very low quality evidence) Source

- Children living at ≤ 2500 m above sea level should receive oxygen therapy if their oxygen saturation is ≤ 90%, as measured by pulse oximetry.

  (Strong recommendation, very low quality evidence) Source

- In children living at high altitude (> 2500 m above sea level), the normal oxygen saturation is lower than those living at sea level. At these altitudes, a lower level of saturation, such as SpO2 ≤ 87%, could be used as a threshold for giving oxygen.

  (Recommendation, very low quality evidence) Source

Oxygen delivery methods

- Nasal prongs are the preferred method for delivering oxygen in infants and children under 5 years of age with hypoxaemia who require oxygen therapy.

  (Strong recommendation, moderate quality evidence) Source

- Where nasal prongs are not available, nasal or nasopharyngeal catheters could be used as alternative delivery methods. Face masks or head-boxes are not recommended.

  (Strong recommendation, moderate quality evidence) Source

Criteria for starting and stopping oxygen therapy

- Children with hypoxaemia should be closely monitored using pulse oximetry.

  (Strong recommendation, very low quality evidence) Source

- Oxygen therapy should be discontinued when oxygen saturation remains stable above recommended levels of 90% (≤ 2500M above sea level) or 87% (> 2500M above sea level) for at least 15 minutes on room air in a clinically stable child.

  (Strong recommendation, very low quality evidence) Source

Choice of intravenous fluids for resuscitation and maintenance in children

- Resuscitation: Children severely dehydrated or with signs of shock should be resuscitated using isotonic intravenous (IV) solutions such as sodium chloride 0.9% or ringers lactate.

  (Strong recommendation, low quality evidence) Source

- Intravenous maintenance fluid: For children who require IV fluids for maintenance, options include ringers lactate solution with 5% dextrose, sodium chloride 0.45% with glucose 5%, sodium chloride 0.45% with glucose 2.5%, or 0.9% sodium chloride with glucose 5%.

  (Strong recommendation, low quality evidence) Source

- Low sodium-containing solutions, such as sodium chloride 0.18% with glucose 4%, or 5% glucose in water, should not be used as there is an increased risk of hyponatraemia leading to cerebral oedema.

  (Strong recommendation, low quality evidence) Source

Treatment of persisting pain

- It is recommended to use the analgesic treatment in two steps according to the child's level of pain severity.

  (Strong recommendation, very low quality of evidence) Source

- Paracetamol and ibuprofen are the medicines of choice in the first step (mild pain). Both paracetamol and ibuprofen need to be made available for treatment in the first step.

  (Strong recommendations, low quality evidence) Source

- The use of strong opioid analgesics is recommended for the relief of moderate to severe persisting pain in children with medical illnesses.

  (Strong recommendation, low quality of evidence) Source

- Morphine is recommended as the first-line strong opioid for the treatment of persisting moderate to severe pain in children with medical illnesses. There is insufficient evidence to recommend any alternative opioid in preference to morphine as the opioid of first choice. Selection of alternative opioid analgesics to morphine should be guided by considerations of safety, availability, cost and suitability, including patient-related factors.

  (Strong recommendations, low quality of evidence) Source

- It is strongly recommended that immediate-release oral morphine formulations be available for the treatment of persistent pain in children with medical illnesses. It is also recommended that child-appropriate prolonged-release oral dosage forms be available, if affordable.

  (Strong recommendations, low quality of evidence) Source

- Switching opioids and/or route of administration in children is strongly recommended in the presence of inadequate analgesic effect with intolerable side-effects. Alternative opioids and/or dosage forms as an alternative to oral morphine should be available to practitioners, in addition to morphine, if possible. Routine rotation of opioids is not recommended.

  (Strong recommendations, low quality of evidence) Source

- Oral administration of opioids is the recommended route of administration. The choice of alternative routes of administration when the oral route is not available should be based on clinical judgement, availability, feasibility and patient preference. The intramuscular route of administration is to be avoided in children.

  (Strong recommendations, very low quality of evidence) Source

- A careful distinction between end-of-dose pain episodes, incident pain related to movement or procedure, and breakthrough pain is needed. It is strongly recommended that children with persisting pain receive regular medication to control pain and also appropriate medicines for breakthrough pain.

  (Strong recommendations, very low quality of evidence) Source

- The use of corticosteroids as adjuvant medicines is not recommended in the treatment of persisting pain in children with medical illnesses.

  (Weak recommendation, very low quality evidence) Source

- The use of bisphosphonates as adjuvant medicines is **not** recommended in the treatment of bone pain in children.

  (Weak recommendation, very low quality of evidence) Source

21. Care for survivors of intimate partner violence

- Where children are exposed to intimate partner violence at home, a psychotherapeutic intervention, including sessions where they are with, and sessions where they are without their mother, should be offered, although the extent to which this would apply in low- and middle income settings is unclear.

  (Conditional recommendation, moderate quality evidence) Source

22. Management of behavioural disorders

Attention Deficit Hyperactivity Disorder

- Provide family psycho-education.
- Consider parent skills training, when available.
- Contact person's teacher (if person goes to school and consent is given by the person and carer), provide advice and plan for special educational needs.
- Anticipate major life changes (such as puberty, starting school, or birth of a sibling) and arrange personal and social support.
- Consider psychosocial interventions such as cognitive behaviour therapy and social skills training based on availability.
- Assess carers regarding the impact of behavioural disorders and offer them support for their personal, social and mental health needs.
- **DO NOT** use medicines for behavioural disorders in children and adolescents.

  Source