



OPTIMAL FEEDING OF LOW BIRTH WEIGHT INFANTS



AUGUST 2017



Ministry of Health & Family Welfare
Government of India





STANDARD TREATMENT GUIDELINES

OPTIMAL FEEDING OF LOW BIRTH WEIGHT INFANTS

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ISBN: 978-93-82655-21-3

Design by: Macro Graphics Pvt. Ltd. (www.macrographics.com)

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What to feed: Choice of milk



For all LBW infants:

Mother's own milk



If no access to mother's milk:

Donor human milk



If no access to both:

Infant formula

What to feed: Supplements

For very low birth weight (<1500 g) infants

Nutrients	How much?	When to start?	Till when?
Calcium	120-140 mg/kg/day	Once infant reaches 100 mL/kg/day of feeds	Term gestation (40 weeks' postmenstrual age)
Phosphorus	60-90 mg/kg/day	Once infant reaches 100 mL/kg/day of feeds	Term gestation (40 weeks' postmenstrual age)
Vitamin D	800 IU/day	Once the infant is on 100 mL/kg/day of feeds	6 months of age*
Iron	2-4 mg/kg/day	2 weeks of age	6 months of age*

*Supplementation beyond 6 months based on the current national/IAP guidelines

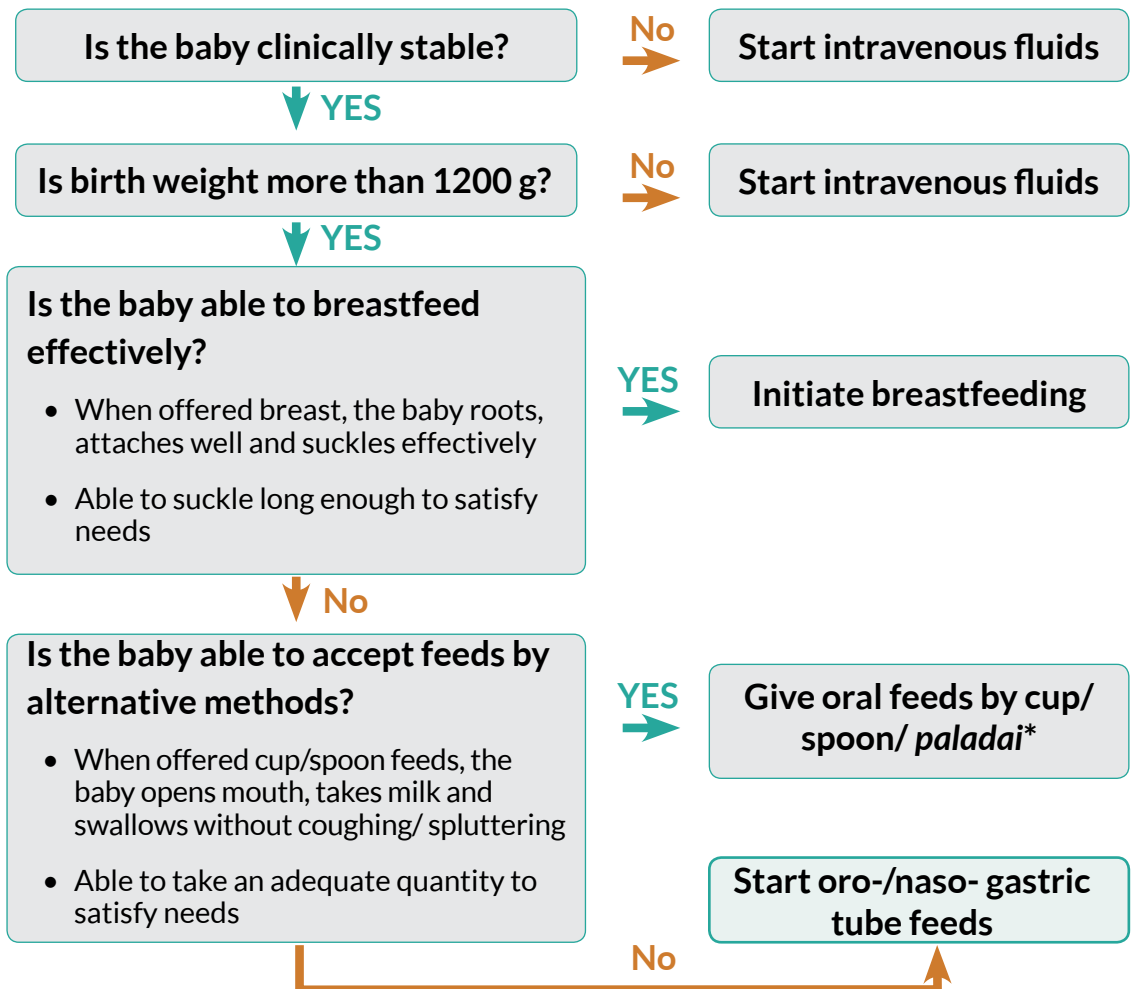
For other low birth weight (1500-2499 g) infants

Nutrients	How much?	When to start?	Till when?
Vitamin D	400 IU/day	Once the infant is on full enteral feeds	6 months of age*
Iron	2-3 mg/kg/day	6-8 weeks of age	6 months of age*

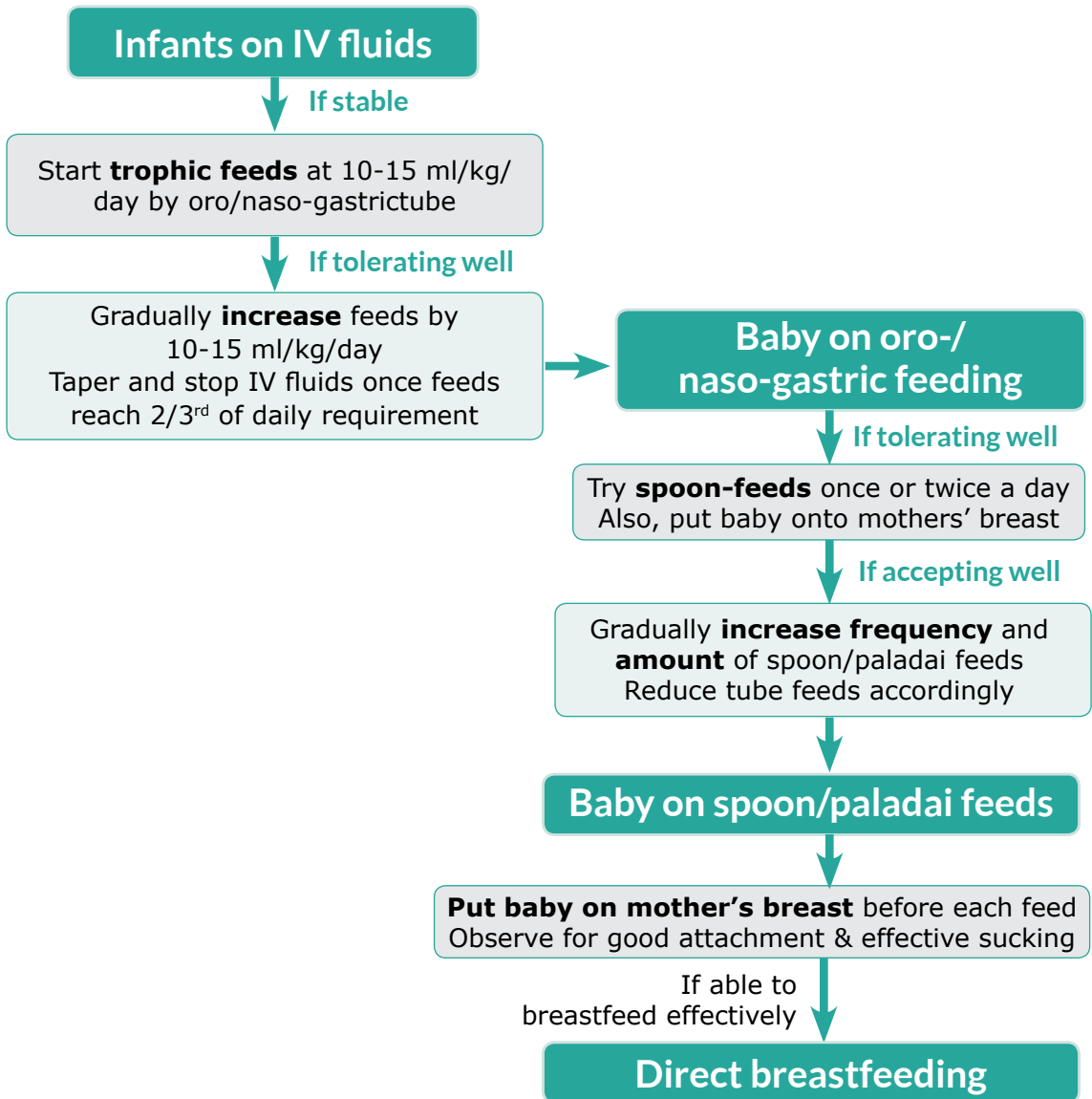
*Supplementation beyond 6 months based on the current national/IAP guidelines

How to feed: Initiation of feeds

ASSESSMENT ACTION



How to feed: Progression of feeds

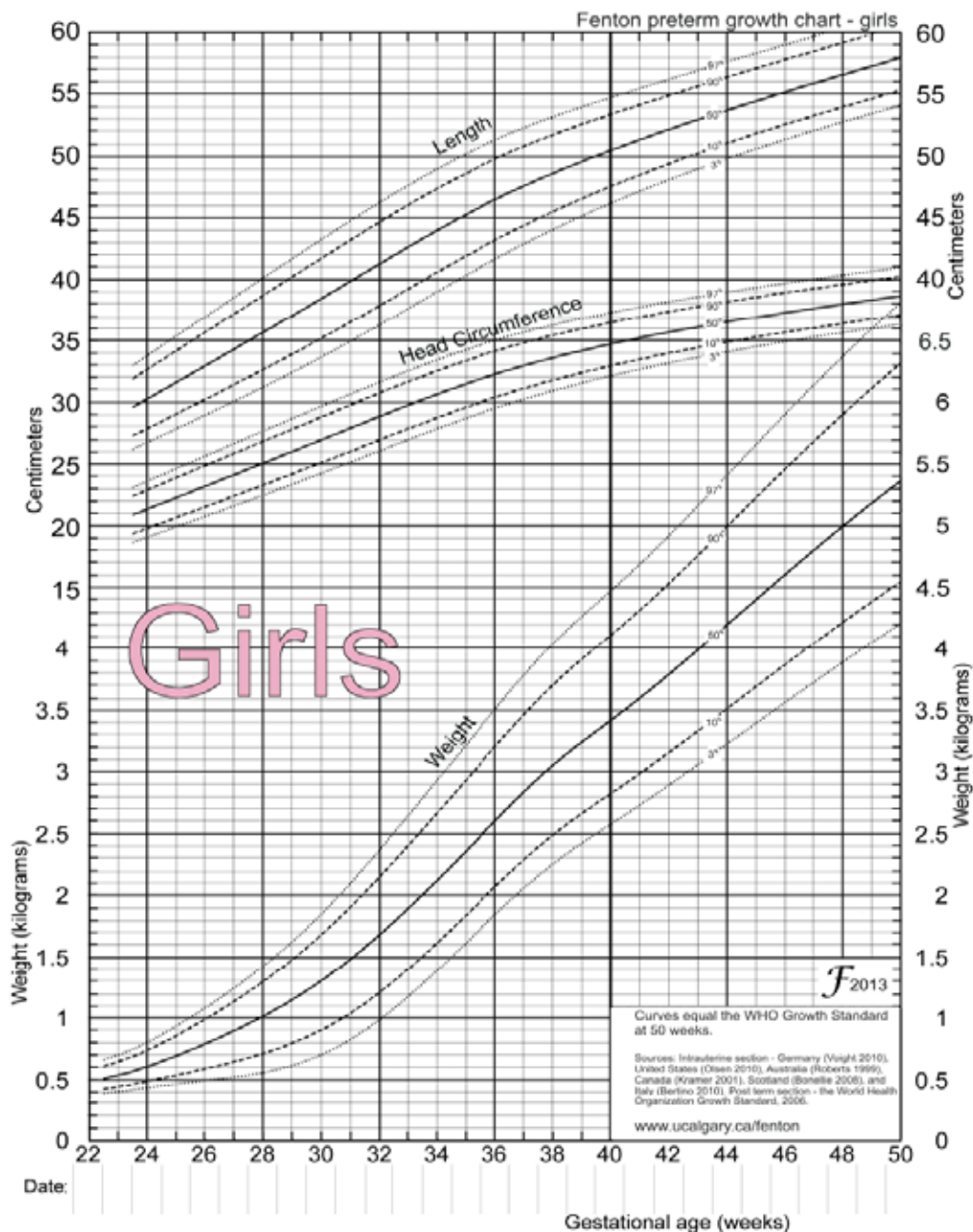


How much to feed?

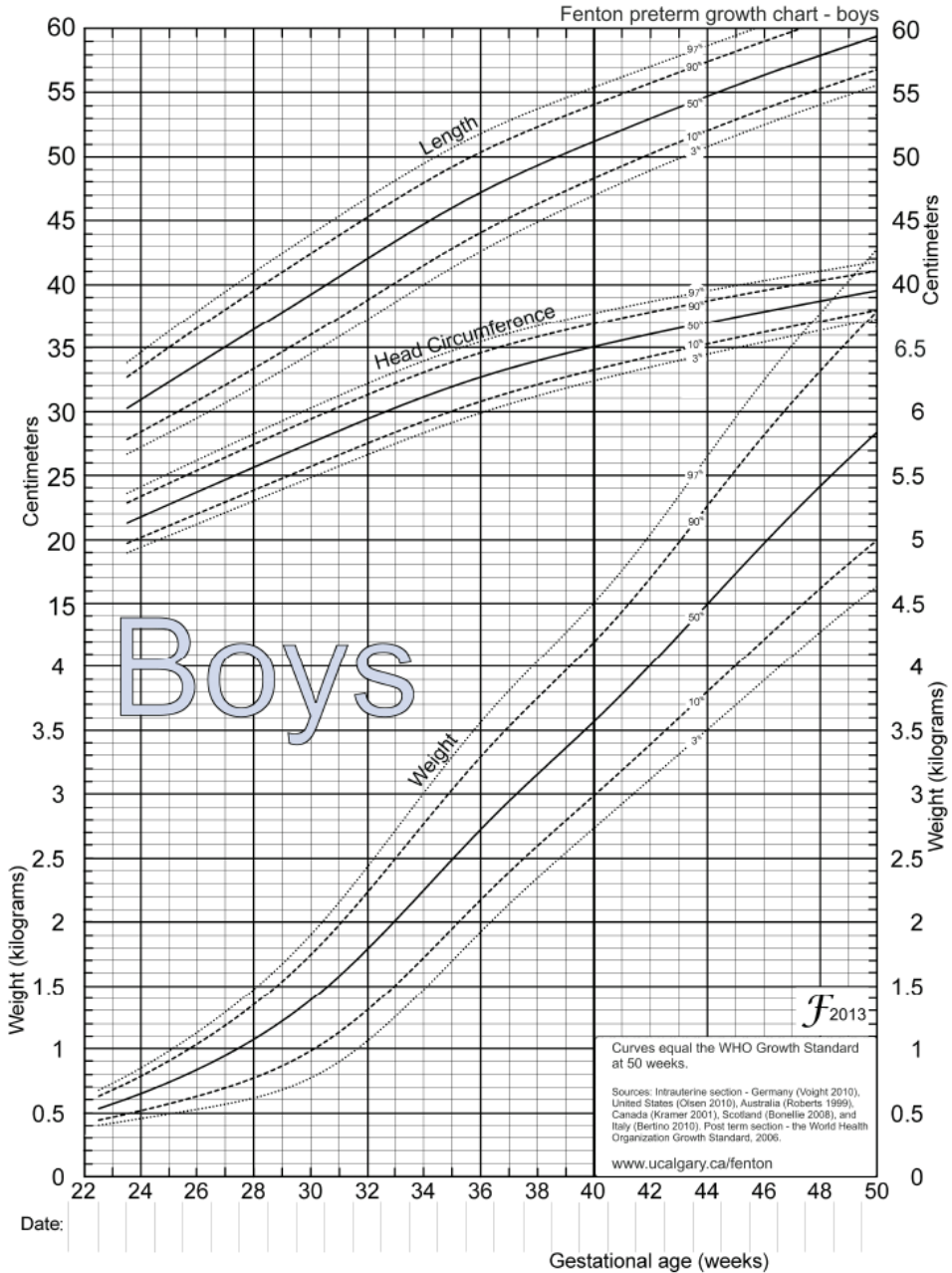
Recommended fluid requirements and feed volumes						
Day of life	2000-2500g		1500-2000g		1000-1500g	
	Fluid requirements ml/kg/day	Feed volumes (Every 3 Hours ml)	Fluid requirements ml/kg/day	Feed volumes (Every 3 Hours ml)	Fluid requirements ml/kg/day	Feed volumes (Every 2 Hours ml)
Day 1	60	17	60	12	60	6*
Day 2	80	22	75	16	70	7
Day 3	100	27	90	20	80	8
Day 4	120	32	115	24	90	9
Day 5	140	37	130	28	110	11
Day 6	150	40	145	32	130	13
Day 7 onwards	160+	42	160	35	150	16

Appendix

Growth monitoring: Fenton's growth chart for GIRLS



Growth monitoring: Fenton's growth chart for Boys



Steps of spoon/*paladai* feeding

Spoon/*Paladai* Feeding

1. Baby should be awake and held sitting semi-upright on caregiver's lap; put a small cloth on front of chest to catch drips of milk
2. Put a measured amount of milk in the spoon/*paladai*
3. Hold the spoon/*paladai* so that the pointed tip rests lightly on the baby's lower lip
4. Tip the spoon/*paladai* to pour a small amount of milk into the baby's mouth at a time
5. Feed the baby slowly
6. Make sure that the baby has swallowed the milk already taken before giving any more
7. When the baby has had enough, he or she will close his or her mouth and will not take any more. Do not force-feed the baby.
8. Wash the spoon/*paladai* with soap and water and then put in boiling water for 20 minutes to sterilize before next feed

Steps of oro-/naso-gastric tube feeding

Intragastric Tube Feeding

1. Before starting a feed, check the position of the tube
2. For each feed, take fresh syringe (ideally disposable) and remove the plunger
3. Connect the barrel of the syringe to the end of the gastric tube
4. Pinch the tube and fill the barrel of the syringe with the required volume of milk
5. Hold the tube with one hand, release the pinch and elevate the syringe barrel to 5-10 cm above the level of the baby
6. Let the milk run from the syringe through the gastric tube by gravity; DO NOT force milk through the gastric tube by using the plunger of the syringe
7. It should take about 10-15 minutes for the milk to flow into the baby's stomach: control the flow by altering the height of the syringe; lowering the syringe slows the milk flow, raising the syringe makes the milk flow faster
8. Observe the infant during the entire gastric tube feed. Do not leave the baby unattended. STOP the feed if the baby shows any of the following signs: breathing difficulty, change in colour/ looks blue, becomes floppy, and vomits
9. Keep the end of the gastric tube between feeds capped; if the baby is on CPAP, the tube is preferably left open for about half an hour after the feeding
10. Avoid flushing the tube with water or saline after giving feeds
11. Progress to feeding by cup/spoon/*paladai* when the baby can swallow without coughing or spitting milk. This could be possible in as little as one or two days, or it may take longer than one week
12. Replace the gastric tube with another clean gastric tube after three days, or earlier in case it is pulled out or becomes blocked.

Guideline Development Process

Guideline Development Group (GDG)

The following experts were involved in the development of these guidelines: Vinod Paul (AIIMS, New Delhi), Ashok Deorari (AIIMS, New Delhi), M Jeeva Sankar (AIIMS, New Delhi), Ruchi Nanavati (KEM, Mumbai), Jayashree Mondkar (LTMMC, Sion, Mumbai), Ramesh Agarwal (AIIMS, New Delhi), Nandkishore Kabra (AIIMS, New Delhi), Ashish Jain (MAMC, Delhi), and N Chandrakumar (AIIMS, New Delhi).

The guideline development group (GDG) met once in September 2015 to deliberate on the steps and timelines. A working group comprising three members of the GDG (MJS, NC, and RN) developed the draft guidelines based on the agreed plan. This draft was reviewed electronically and approved by the other GDG members.

Declaration of interests

All the members of the GDG declare no conflict of interest.

Funding source

National Health Systems Resource Center (NHSRC), New Delhi

Scheduled review

We plan to update the STG every 3 years.

Step 1: Search and select guidelines

The GDG searched the electronic database MEDLINE via PubMed and the websites www.who.int (World Health Organization), <http://www.guideline.gov> (National Guideline Clearing House of US), <http://www.nice.org.uk> (National Institute for Clinical & Care Excellence, UK), www.aap.org (American Academy of Pediatrics), www.cps.ca (Canadian

Pediatric Society), and www.nnfi.org (National Neonatology Forum, India) to search for existing guidelines on feeding of low birth weight infants.

The following search strategy “(feeding[All Fields] AND (“infant, low birth weight”[MeSH Terms] OR (“infant”[All Fields] AND “low”[All Fields] AND “birth”[All Fields] AND “weight”[All Fields]) OR “low birth weight infant”[All Fields] OR (“low”[All Fields] AND “birth”[All Fields] AND “weight”[All Fields] AND “infants”[All Fields]) OR “low birth weight infants”[All Fields])) AND Guideline[ptyp]” was used for searching PubMed. A similar search strategy was used to search the websites of national and international organizations.

Two relevant citations – one each by the World Health Organization and Chinese Society of Parenteral and Enteral Nutrition (CSPEN) – were identified. In addition, the GDG identified another guideline – by National Neonatology Forum, India – by hand searching. Another review-cum-guidelines – published recently in 2015 – by an expert group from McMaster University, Canada was also identified by hand searching.

Step 2: Compare and sift guidelines

Out Of the three guidelines (WHO, CSPEN, and NNF) only one – by the World Health Organization – has been evaluated thoroughly by the National Guideline Clearinghouse of the US (www.guideline.gov). The technical quality and the process of development of the other two guidelines were evaluated by two members of the GDG using the AGREE-GRS instrument (<http://www.agreetrust.org/>).

Both the guidelines scored 3 to 5 in the 7-point scale for individual items (lowest quality being 1). On the overall guideline assessment, one guideline (CSPEN) scored 2 while the NNF guidelines scored 6 (strongly disagree=1; strongly agree=7 in a 7-point scale).

The GDG unanimously decided to use the WHO feeding guidelines as the base for the present guidelines and adopt it using the NNF guidelines, if there was a need to adopt the recommendations to Indian context.

The WHO guidelines were published in year 2011. Because the evidence behind the recommendations was relatively old, the GDG planned to examine the recently published systematic review on feeding of LBW infants to update the evidence and to decide on the need to modify the recommendations.

Step 3: Search and select recommendations

Before searching and selecting the recommendations, the GDG examined the research questions (RQ) addressed by the WHO and NNF guidelines in the meeting held in Delhi in late 2015. The group deliberated and enlisted the following steps:

- 1) Examine the appropriateness and relevance of RQs in WHO feeding guidelines
- 2) Identify other relevant RQs in NNF Clinical Practice Guidelines to complement those in WHO guidelines
- 3) Discuss with other stakeholders – particularly healthcare providers from secondary level health facilities – to identify research questions that are relevant to their settings.

Discussion with other stakeholders

The GDG conducted an electronic survey followed by telephonic discussion among healthcare providers from secondary level facilities to identify additional research questions. The group did not identify any relevant additional questions.

Recommendations

After enlisting the research questions, the GDG finalized the recommendations by adopting or adapting the original recommendations from the WHO and NNF guidelines:

- Adopting a recommendation entails transferring the recommendations verbatim to the new guideline.
- Adapting a recommendation entails making some changes to the recommendation. This could be a minor edit in order to ensure local compatibility with the country setting, or adding precisions to the wording to clarify the recommendation.



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