PMCT TRAINING CURRICULUM

Module 2

MATERNAL NUTRITION
AND PREPARATION FOR
BREASTFEEDING

prepared by
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Module 2

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Module 2 — Unit 1

Maternal nutrition

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Maternal nutrition

Introduction

A well-nourished woman is likely to be in good health. Consequently she is able to look after the family well. When she is pregnant, the outcome of her pregnancy is likely to be favourable and her lactation performance is enhanced.

Objective

By the end of this unit, the participant should be able to promote adequate maternal nutrition and to recognize and manage nutritional deficiencies.

Introduce the topic through these statements.

In the context of reproductive health, the woman is looked on as the

⇒ carrier of the foetus
⇒ deliverer of the baby
⇒ feeder of the child

Rarely do we consider the woman as a human being with her own individual needs and as a result maternal nutrition is a relatively neglected topic. The need for adequate nutrition starts at conception and goes through childhood and adolescence to adulthood.

Neglect of childhood nutrition leads to a stunted adult. For a woman to have a good outcome of her pregnancy, she needs to enter it when she is adequately nourished.

Nutritional deficiencies, such as anaemia and vitamin A deficiency, are associated with mother-to-child transmission. Maternal malnutrition is also associated with preterm delivery, a factor that significantly increases the risk of HIV infection in the infant. Therefore, maternal nutrition during pregnancy and lactation is of considerable importance in preventing mother-to-child transmission of HIV.
Promotion of good maternal nutrition

Discuss the nutritional requirements through the different stages of a woman’s life.

The essential components of a balanced diet are

- protein
- energy
- minerals
- micronutrients

These nutrient requirements are essential to maintain

- basal metabolic rate
- physical activity
- growth

Diet should compensate for ongoing loss such as loss of iron during menstruation.

The nutritional requirements differ during various stages of a girl’s life:

- **Girl-child:** This is a stage of rapid growth and therefore the requirements for all nutrients increase.
- **Adolescent:** This stage is characterized by a growth spurt and onset of maturation; nutritional demands are high.
- **Non-pregnant, non-lactating woman:** Requirements for iron are ongoing to accommodate monthly loss through menstruation.
- **Pregnant woman:** During a normal pregnancy, a woman gains 10 to 12 kg. This weight includes the baby, placenta, amniotic fluid and subcutaneous fat.
- **Lactating woman:** Breastfeeding is a metabolically active process. Women require the equivalent of a whole extra meal per day to accommodate lactation. Under normal circumstances, the energy needs of lactation are accommodated by improved metabolic efficiency, increased nutrient intake, and breakdown of subcutaneous fat. If nutritional intake during pregnancy and lactation is inadequate, foetal growth and milk production go on at the expense of the woman’s own nutritional status.
Factors affecting maternal nutrition

Nutrient intake

Beliefs and culture

Different cultures have different belief systems about the foods pregnant and lactating women should eat. Often, nutritious protein foods are excluded from the diet. Familiarize yourself with the food taboos in the community you serve so that you are able to address them during health education and counseling.

Cravings

During pregnancy, women experience strong cravings for certain foods or non-food material such as soil or stones. These cravings are often due to deficiency of essential micronutrients. The pregnant woman should be counseled on how to ensure she is eating a balanced diet within the resources available to her. She should be discouraged from eating soil or stones because of the risk of intestinal parasites.

Heavy workload

A heavy workload requires a lot of energy calories. Light work carried out for a long time also requires considerable amounts of calories. In a normal pregnancy, physiological adjustments include improved efficiency of metabolism and reduced physical activity. However, if a woman’s diet is only marginally nutritious, the competing needs of physical work and pregnancy contribute significantly to nutritional depletion and increase her chance of delivering a low-birth-weight infant.

Physical exercise

Physical exercise with adequate nutritional intake does not adversely affect the woman’s health status. However, excessive exercise and physical work with inadequate nutritional intake increase the risk of a low-birth-weight infant.
Body image

Pregnancy and lactation changes a woman’s shape. Some women are unable to accept these changes and try to diet during this period in an effort to maintain their shape. The dieting may lead to inadequate nutritional intake.

Addictive drugs

? What are the effects of addictive drugs on the foetus?

Alcohol

Alcohol intake during pregnancy may lead to foetal alcohol syndrome. The risk is not dose related and any amount may pose a risk to the foetus. In heavy drinkers, the baby may be born with abnormalities of the eyes, nose, heart and central nervous system that may include growth retardation and mental retardation. Moderate drinkers may also have babies with foetal alcohol syndrome. They also tend to have a higher rate of spontaneous abortion and low-birth-weight delivery. ‘Possible foetal alcohol syndrome’ is a term used for children with learning and behavioural disorders who were exposed to alcohol during the foetal stage but do not have the physical features seen in babies exposed to heavy or moderate alcohol intake.

Tobacco

Smoking doubles the risk of low birth weight. This risk is higher for women over 35 than for younger women. On average, babies of smokers weigh 200 g less than babies of non-smokers. It is not clear whether smoking causes congenital malformation but it does cause serious pregnancy complications that include

⇒ bleeding during pregnancy
⇒ premature rupture of membranes
⇒ prolonged rupture of membranes
⇒ preterm delivery

Young infants who are exposed to smoke, including cigarette smoking, are at increased risk of acute respiratory infections and deterioration into an asthmatic condition.
Marijuana

Children exposed to marijuana in the foetal stages have

⇒ disturbed sleep patterns
⇒ intellectual deficiency, especially in short-term memory and in verbal and abstract reasoning

These defects persist beyond early childhood and are observed in school-age children.

Caffeine

There is evidence to suggests that heavy consumption of caffeine increases the risk of spontaneous abortion. Caffeine is present in beverages such as tea and coffee and therefore they should be drunk in moderation.

😊 Ask the participants to discuss the commonest drugs of addiction in their population. Which populations of pregnant women use these drugs?

💐 Indicators of adequate nutrition

The many factors considered to be indicators of adequate nutrition include

⇒ birth weight
⇒ mother’s weight
⇒ mother’s height
⇒ mother’s body mass index
⇒ mid-arm circumference
⇒ absolute weight gain in pregnancy
⇒ rate of weight gain
⇒ weight loss during lactation
⇒ anaemia

Each of these factors is an indicator of different aspects of nutrition.
Infant birth weight

What factors affect the infant’s birth weight?

Maternal nutrition during pregnancy and lactation is often discussed from the point of view of infant birth weight. Maternal nutritional factors that affect birth weight include both long-term and short-term indicators of good nutrition.

Discuss the prevalence of low birth weight in Kenya. How do we measure low birth weight? How feasible is it to do so?

Mother's height

Height is a measure of skeletal growth. Taller women have heavier babies than do shorter women. Short stature is often the result of chronic food shortage during childhood. The likelihood of having a contracted pelvis is greater in short women, and with it is a higher risk of obstructed labour, requiring operative delivery.

Mother's prepregnancy weight

Low prepregnancy weight is associated with low birth weight. Adequate maternal nutritional intake during pregnancy does not diminish the birth-weight disadvantage conferred by short stature and low prepregnancy weight. However, adequate nutritional intake is important for the mother’s own well-being.

Body mass index

Body mass index (BMI), a composite measure of weight and height (BMI = weight in kilograms divided by height$^2$ in metres). For example, a woman who is 1.6 metres tall and weighs 55 kg has a BMI of 55 divided by the square of 1.6; this gives a BMI of 21.5. BMI is a reasonable indicator of current nutritional status.

Women with BMI less than 18 are classified as being severely energy depleted, 18 to 21 as moderately depleted while over 21 is considered adequate nutritional status. BMI changes considerably during pregnancy and is difficult to interpret but it is a useful measure of nutritional status during lactation and in the non-pregnant state.
Mid-upper-arm circumference

The mid-upper-arm circumference (MUAC) is measured using a non-stretch tape. To ensure standard practice, MUAC is measured on the left arm. As MUAC does not change appreciably during pregnancy, it is a more stable measurement than BMI. MUAC is a good measure of the body’s muscle mass and therefore a good indicator of body protein.

Weight gain during pregnancy

Weight gain during pregnancy is an indicator of the mother’s nutritional status during pregnancy. The weight gain is due to the products of conception and maternal fat stores. The fat stores laid down during pregnancy are used as a source of energy during periods of rapid infant growth in late pregnancy and energy for labour and lactation. Table 2.1.1 outlines the distribution of weight gain during pregnancy.

<table>
<thead>
<tr>
<th>Product</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foetus</td>
<td>3.0</td>
</tr>
<tr>
<td>Placenta</td>
<td>0.4</td>
</tr>
<tr>
<td>Amniotic fluid</td>
<td>0.8</td>
</tr>
<tr>
<td>Uterus (weight increase)</td>
<td>1.1</td>
</tr>
<tr>
<td>Breast tissue (weight increase)</td>
<td>1.4</td>
</tr>
<tr>
<td>Blood volume (weight increase)</td>
<td>1.8 (1500 ml)</td>
</tr>
<tr>
<td>Maternal fat stores</td>
<td>1.8–3.6</td>
</tr>
<tr>
<td>Total</td>
<td>10.3–13.9</td>
</tr>
</tbody>
</table>

Recommended weight gain during pregnancy

Recommended weight gain is based on a woman’s prepregnancy weight (see table 2.1.2). During pregnancy the nutritional status can be monitored by rate of weight gain. In the first trimester a woman should gain 1 to 3 kg. Thereafter the weight gain should be approximately 1 kg a week for the remainder of the
pregnancy. A higher weight gain is not normal and is associated with pregnancy complications such as pre-eclampsia and diabetes. Such a mother requires other evaluation.

Table 2.1.2
Recommended weight gain during pregnancy

<table>
<thead>
<tr>
<th>Pregnancy state</th>
<th>Recommended gain (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>If prepregnancy weight was—</td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>11.5–18.0</td>
</tr>
<tr>
<td>Underweight</td>
<td>12.5–18.0</td>
</tr>
<tr>
<td>Overweight</td>
<td>7.0–11.5</td>
</tr>
<tr>
<td>Twin pregnancy</td>
<td>16.0–20.5</td>
</tr>
<tr>
<td>Adolescent pregnancy</td>
<td>upper end of recommended values for women</td>
</tr>
</tbody>
</table>

Pregnancy weight gain among Kenyan women

A number of studies have examined the pregnancy weight gain among Kenyan women and found that their weight gain is usually inadequate. The average weight gain is 6 to 7 kg, and a large proportion of women lose weight in the third trimester. Women with the lowest weight gain have smaller babies at birth.

Nutritional requirements during lactation and the postnatal period

How does maternal nutrition affect lactation performance?

Lactation is a metabolically expensive process requiring an additional 600–700 kcal every 24 hours. The energy requirements are highest during exclusive breastfeeding when milk production is maximal. This energy amount is equivalent to an extra meal per day. Lactating women meet these requirements by:

⇒ increasing their nutritional intake
⇒ the body improving the efficiency of its metabolism
⇒ the body using the energy it has stored during pregnancy
⇒ decreasing their level of physical activity
These physiological mechanisms allow women to make adequate amounts of milk across a wide range of conditions affecting maternal nutrition. During periods of adequate nutrition the most important source of energy is the daily nutritional intake. When the nutritional intake is inadequate, the body uses its nutritional stores to maintain breast-milk production. Poorly nourished women do not have the energy resources as a safety mechanism, and as a result their milk production declines. A number of studies have documented the decline in breast-milk production of malnourished women during the preharvest season when food supplies are inadequate.

For the mother, the postnatal period is a period of involution. Well-nourished women lose 0.4 to 0.8 kg a month for the first 6 months and then lose more slowly. Poorly nourished women whose weight during pregnancy has been inadequate gain weight during lactation to make up for the inadequate intake during pregnancy. Preliminary observations indicate that breastfeeding increases the likelihood of dying for HIV-infected women with advanced disease. It is thought that this could be due to nutritional depletion by breastfeeding and from the HIV disease. Promoting good nutrition in the lactating woman is, therefore, of benefit to both the mother and her baby.

Inadequate nutritional intake by the mother may result in

- early onset of infant stunting
- early weaning

Babies who are stunted or are weaned too early have a high likelihood of dying from malnutrition.

Indicators of adequate micronutrient intake during pregnancy and lactation

Micronutrients are essential for good health. Requirements for them increase during pregnancy and lactation. In this section, we discuss

- vitamin deficiencies
- mineral deficiencies
- trace elements

Highlight the following points to emphasize the importance of micronutrients in health.
Micronutrient deficiencies have a direct impact on the health of pregnant women, including HIV-infected women. Anaemia increases the likelihood for a woman to transmit HIV infection to her infant. Anaemic pregnant women may require a blood transfusion, thus putting them at risk of HIV infection. Women who are anaemic during pregnancy increase by sixfold their chance of dying in the year after a delivery. The common causes of nutritional anaemia are deficiencies in iron, folic acid and vitamin B12. Therefore, preventing anaemia is important for the health of both HIV-infected and uninfected women.

Supplementing the diet of HIV-uninfected pregnant women with vitamin A reduces mortality. Similarly, vitamin A supplementation reduces mortality of HIV-infected and uninfected children. In HIV-infected women, vitamin A deficiency is associated with increased MTCT of HIV.

Here we highlight the key micronutrients. The learner should review textbooks of medicine for a more comprehensive discussion.

### Mineral micronutrients

Most of the body’s calcium and phosphorus is found in the bones and teeth. Pregnancy increases the requirements for these elements, to mineralize the foetal skeleton and deciduous teeth. The requirements are maximal during the third trimester, when foetal bone growth is the most rapid.

#### Calcium

The recommended daily allowance for calcium is 400 to 800 mg.

**Sources of calcium**

The main sources of dietary calcium are

⇒ milk and milk products
Calcium absorption in the gut improves during pregnancy to accommodate the increased physiological requirements.

It is estimated that the foetus draws 13 mg of calcium an hour, or 250–300 mg a day. Evidence from randomized clinical trials suggests that

⇒ women with low calcium intake increase their risk of hypertension, oedema and pre-eclampsia
⇒ supplementation with calcium after 20 weeks of gestation lowers blood pressure and reduces the possibility of preterm delivery

**Deficient calcium intake**

Inadequate calcium intake manifests with

⇒ softening of the bones (bone demineralization)
⇒ body swelling, loss of protein in the urine, and elevated blood pressure
⇒ increased likelihood of pregnancy-related high blood pressure (pre-eclampsia)

**Phosphorus**

**Recommended phosphorus intake**

- The normal recommended intake of phosphorus is 400 mg per day. During pregnancy women should take an additional 400 mg daily for a total of 800 mg per day.
- Women should avoid foods high in phosphorus and low in calcium such as sodas and other carbonated drinks.

**Sources of phosphorus**

Processed foods with the exception of milk products are high in phosphorus and low in calcium.
Phosphorus is in a constant ratio with calcium in blood. This ratio can be disturbed by the food intake. Excess phosphorus intake binds calcium and prevents the gut from absorbing it.

A high phosphorus-to-calcium ratio in blood increases the loss of calcium in bone. During pregnancy lowered calcium levels and the mild alkalosis caused by reduced maternal CO$_2$ increase muscle irritability, leading to a tendency towards cramps. This predisposition is accelerated by a high phosphorus and low calcium intake. The cramps may be relieved by increasing milk intake, as milk is high and calcium and phosphate, or by taking non-phosphate calcium salts.

**Magnesium**

Magnesium is found in bone, bound to calcium and phosphorus. Not enough is known about its effect on pregnancy. A number of studies show that higher magnesium intake is associated with a lower incidence of pregnancy-related muscle cramps.

**Sources of magnesium include**

⇒ leafy green vegetables
⇒ nuts
⇒ wheat bran
⇒ soy bean
⇒ wheat germ

Animal products and fruits are poor sources of magnesium.

**Iodine**

Iodine deficiency is the leading cause worldwide of mental retardation. In the past iodine deficiency was prevalent in Kenya. The use of iodized salt has to a certain extent reduced the prevalence. However in many communities, because iodized salt is expensive the tendency is to use the cheaper salt for animals that is not iodized.

**Sources of iodine**

Iodized salt is the best source of iodine. The salt needs to be stored in a dark
container to retain adequate amounts of iodination. High concentrations of flavanoids in the diet interfere with the absorption of iodine. Foods that contain large amounts of flavanoids include cassava.

**Excess iodine intake in pregnancy may be harmful to the foetus.** Women on iodine-containing drugs for treatment of asthma and thyroid disorders are at increased risk of exposing their foetus to excessive iodine.

**Iodine deficiency**

Manifestation of severe iodine deficiency includes

⇒ mental retardation
⇒ deafness
⇒ motor rigidity
⇒ poor attention span leading to impaired learning
⇒ hypothyroidism

These conditions are most frequently found where the prevalence of goitre is over 30%. Pregnant women with hypothyroidism have increased incidence of

⇒ stillbirths
⇒ cretinism in the infant
⇒ mild motor and cognitive defects in the infant

**Iodine supplementation**

Adding iodine supplementation to the diet before pregnancy reduces the risk of cretinism more than does supplementation during pregnancy.

**Iron**

Iron is essential for producing haemoglobin. The adequacy of iron intake is assessed by measuring the haemoglobin level. The total amount of iron required for the whole duration of a pregnancy is 670 mg. This iron is distributed as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Amount</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>foetus</td>
<td>246 mg</td>
<td>(200–370 mg)</td>
</tr>
<tr>
<td>placenta</td>
<td>134 mg</td>
<td>(30–170 mg)</td>
</tr>
<tr>
<td>expanded maternal blood volume</td>
<td>290 mg</td>
<td>(90–800 mg)</td>
</tr>
<tr>
<td>total</td>
<td>670 mg</td>
<td>(310–880 mg)</td>
</tr>
</tbody>
</table>
The consequences of iron-deficiency anaemia can be classified into maternal and foetal outcomes.

- Maternal outcomes include heavy bleeding (haemorrhage) during pregnancy and delivery and puerperal infections.
- Foetal outcomes include prematurity, low birth weight, and increased risk of anaemia. Preterm babies are at high risk of acquiring HIV infection from their mothers. Iron supplementation is an inexpensive way of reducing this risk.

In the last trimester of pregnancy, when iron is actively transferred across the placenta, the foetus is a virtual parasite in acquiring iron from the mother. Iron deficiency in the newborn is a feature of babies who are born prematurely, because the baby has not had enough time to accumulate iron in the body. The iron-deficiency anaemia manifests itself by the age of 3 months. Preterm babies require iron supplementation to prevent iron-deficiency anaemia.

Many women begin pregnancy with inadequate iron stores. They continue to take in inadequate amounts of iron-rich foods; hence they need supplements.

A diagnosis of anaemia is made if haemoglobin levels are less than 11.0 g/dl or the haematocrit is under 33% in the first and third trimester. During the 2nd trimester a haemoglobin of less than 10.5 g/dl or a haematocrit of under 32% is diagnostic of anaemia.

**Dose for iron supplementation**

The recommended dose for iron supplementation during pregnancy and lactation is 300 mg of ferrous sulphate once a day. Oral iron may cause acute gastritis, and many women are unable to tolerate a daily dose of iron therapy. The same dose administered three times a week has been found to provide adequate amounts of iron for the pregnant woman.

**Vitamin intake during pregnancy**

**Vitamins**

Adequate vitamin intake during pregnancy is essential. We will now consider the different groups of vitamins.
Thiamin, niacin and riboflavin

The vitamins thiamin, niacin and riboflavin are important coenzymes in different metabolic processes that generate energy. Pregnancy is characterized by increased energy requirements. Therefore, consumption of these vitamins needs to be increased. Good sources are milk and milk products, lean meat and leafy green vegetables.

Folic acid

Folic acid is essential in synthesizing RNA, an important component of cell cytoplasm, and of DNA, the key component of the cell nucleus. Folic acid is also critical for manufacturing non-essential amino acids. These processes are essential for the body to produce new cells.

Folic acid is deficient if dietary intake is inadequate or when body demand increases. Conditions that increase the breakdown of red cells such as malaria and abnormalities of the red cell such as sickle-cell anaemia increase the requirements for folic acid. Persons with these condition are at increased risk of deficiency.

- Folic acid deficiency causes megaloblastic anaemia.
- Folic acid deficiency in pregnancy increases the frequency of neural tube defects (anencephaly and spinal bifida). Preconception supplementation with folate reduces the incidence of neural tube defects by 70%.

Sources of folic acid

Good sources of folate include liver, ripe banana, leafy green vegetables, orange juice and avocado.

All pregnant women should supplement their diet with 5 mg of folic acid daily to prevent megaloblastic anaemia.

Vitamin B12

Deficiency in vitamin B12 causes megaloblastic anaemia and irreparable damage to the central nervous system. This deficiency, however, is rare; it is associated with a strict vegetarian diet.
Vitamin A

Vitamin A plays an important role in maintaining integrity of epithelial surfaces such as the skin and mucous membranes. It is essential for normal immune responses. Not enough is known, however, about vitamin A in pregnancy. Maternal supplementation with vitamin A is associated with

⇒ reduced prevalence of anaemia
⇒ reduced maternal mortality
⇒ increased survival of HIV-infected women and children

Vitamin A deficiency is associated with

⇒ impaired vision with the earliest symptom being night blindness
⇒ increased mortality
⇒ mother-to-child transmission of HIV
⇒ higher concentrations of HIV-1 virus in breast milk of immunosuppressed women

Studies in developed countries, where the prevalence of vitamin A deficiency is low, have found that vitamin A intake of over 10,000 units in preconception and early pregnancy is associated with increased risk of birth defects in babies. Studies of vitamin A supplementation among women in developing countries, where vitamin A deficiency is common, did not find any evidence of increased birth defects. It is currently recommended that pregnant women be supplemented with a low dosage of vitamin A not exceeding of 5000 units per day. New research findings show that high doses of vitamin A supplementation may increase breast-milk transmission and therefore low dose supplementation should be maintained during the period of lactation.

Good sources of vitamin A include fish, fish oil, liver, yellow and green vegetables, and fluids.

Vitamin C

Vitamin C is essential for producing the collagen matrix, the building block for all connective tissue such as skin, bone, teeth and tendons. Severe deficiency causes scurvy; however, this condition is rare in pregnancy.
Sources of vitamin C

- Good sources of vitamin C are citrus fruits, especially fresh orange juice.
- The recommended daily intake is 60 mg per day.
- Excessive use of large amounts of vitamin C during pregnancy may change foetal metabolism, make the baby overdependent on vitamin C and thus increase the risk of a deficiency syndrome.

Vitamin D

Vitamin D is important for maintaining strong bones and teeth. Vitamin D deficiency in pregnancy can lead to low levels of calcium in the foetus and poor development of the teeth. The body is able to make vitamin D following exposure to sunshine. Therefore vitamin D deficiency is not common in the tropics. In urban areas where working women spend most of the time indoors in offices, or if their culture requires that they be covered up all the time, such as the buibui-clad Muslim women, there is a risk of being vitamin D deficiency. Excessive intake of vitamin D may be harmful to the foetus and causes hypercalcaemia.

Vitamin K

Vitamin K is essential for blood clotting. Maternal deficiencies have not been described. It is transported across the placenta to the foetus. Newborn babies with vitamin K deficiency are at risk of spontaneous bleeding such as intracranial bleeding or bleeding from the cord. Babies may become severely anaemic and require a blood transfusion. Vitamin K is synthesized in the liver and deficiencies are related to immaturity of the liver in the newborn baby. Deficiency in the infant is treated with supplementation with vitamin K. Preterm babies and babies of mothers with complicated pregnancies are routinely supplemented with vitamin K.

Vitamin E

Vitamin E is important in maintaining the health of cell membranes. This vitamin protects cells from oxidative stress. The foetal vitamin E level is 1/4 to 1/3 of that in the mother. Supplementing the vitamin in the pregnant woman does not increase the level in the baby. Babies born of mothers low in vitamin E may suffer from spontaneous haemolysis (destruction of red cells) in the first 6 months of life.
Vitamin supplementation in pregnant HIV-infected women

Micronutrient supplementation has been found to be beneficial to both HIV-infected and uninfected women. In a Tanzanian study HIV-seropositive and HIV-seronegative women were randomized to receive a multivitamin supplement containing vitamins B1, B2, B6, niacin, B12, C and E, folic acid and iron or a supplement containing iron and folate alone. The micronutrient supplement that included the B vitamins significantly reduced the incidence of low birth weight, severe preterm delivery and babies small for gestation. The multivitamin supplementation was also beneficial to these HIV-1 infected women. Overall, women on multivitamin supplementation had significantly elevated CD8, CD8 and CD3 lymphocyte counts; immunosuppressed people have low CD4 counts.

Discuss clinical examination for micronutrient deficiency. What abnormalities are found in the following body tissues when there are nutritional deficiencies?

⇒ skin and nails
⇒ mucous membranes
⇒ teeth
⇒ eyes
⇒ gastrointestinal function
⇒ skeleton
⇒ thyroid size
⇒ haemoglobin content
⇒ birthweight of offspring

Diets of women

• What are the locally available foods and what is their nutritional value?
• What combinations are necessary to achieve an adequate diet?
• What does a ‘serving’ of a particular food mean?
• When would food supplementation be necessary?
What foods does the community think . . .

⇒ enhance lactation performance?
⇒ impair lactation?

Interaction of HIV infection and nutrition

⇒ effect of nutrition on HIV infection
⇒ effect of HIV infection on nutrition

Factors contributing to nutritional impairment in the HIV-infected mother

What is the cause of nutritional impairment in HIV infection?

Four factors have been implicated in nutritional impairment in HIV-infected persons:

⇒ poor energy intake
⇒ malabsorption of nutrients from the gut
⇒ abnormal energy utilization
⇒ psychological and social stress

Poor energy intake

HIV-infected persons are unable to eat adequate amounts of food, and therefore they do not receive the nutrients they require. Several conditions may make it difficult for the person to eat enough:

• Oral lesions—infection with candida, herpes simplex or cytomegalovirus. These infections make the mouth sore, and the HIV-infected person experiences pain when chewing and swallowing food.
• Gastric irritation, nausea or vomiting caused by HIV and its co-morbidities or the medication being taken leads to loss of appetite and reduced nutritional intake.
• Patients suffering from encephalopathy may reduce their nutrient intake.
• Primary anorexia may lead to reduced nutrient intake. There is evidence that some of the products of inflammation such as the tumour necrosis factor may cause profound anorexia in HIV-infected individuals.

**Gastrointestinal tract absorption**

Absorption of nutrients in the gastrointestinal tract is impaired in the HIV-infected person because of primary HIV infection of the gut epithelium as well as infection with other pathogens that cause malabsorption such as bacteria, protozoa, fungi and viral agents. These infections commonly manifest themselves with diarrhoea.

**Energy use**

During infections, including HIV, the basal metabolic rate increases. Therefore, a higher caloric intake is needed to sustain normal metabolism. The HIV-infected person sustains an increase in the basal metabolic rate whether that person is receiving enough nutrients or not, and this leads to a breakdown of body tissues and subsequent wasting.

**Social and psychosocial status**

In nearly all instances, HIV is a family diagnosis that exerts social, psychological and economic stress on the individual and the entire family.

Financial constraints from a variety of factors including loss of employment or increased health expenditure limit the family resources available to ensure a varied and nutritious diet for the sick person and the other family members.

**Assisting HIV-infected women to maintain good nutrition**

😊 Ask participants to give suggestions.

🌟 Group work

Give this exercise as a homework assignment. Divide the participants into three groups. Ask them to prepare a day’s menu for a pregnant woman in the region they come from. They should consider the following:
⇒ a peasant farmer with Ksh 50 per day for food
⇒ an urban housewife with Ksh 100 per day for food
⇒ a woman who is employed, such as a nurse or a teacher

The groups should visit the local market to determine what foods are readily available and the costs. Food composition tables should be consulted in carrying out this exercise. The groups should then present to each other in a plenary session. The participants should highlight the lessons learned and what impact this will have on their nutritional counseling of pregnant women.
Maternal nutrition

Objective
By the end of this session, the participant should be able to promote adequate maternal nutrition and recognize and manage nutritional deficiencies.

Factors affecting women’s nutritional status

- Nutrition intake
- Workload
- Physical exercise
- Body image
- Addictive drugs

Indicators of adequate nutrition

- Birth weight
- Mother’s weight and height
- Body mass index
- Mid-term circumference
- Weight gain
  - Rate
  - Absolute
- Weight loss during lactation
- Anaemia
Average weight of the products of pregnancy

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</tr>
<tr>
<td>Maternal fat store</td>
<td>1.8–3.6</td>
</tr>
<tr>
<td>Total</td>
<td>10.3–13.9</td>
</tr>
</tbody>
</table>

Micronutrient requirements during pregnancy

Minerals

- Calcium
- Phosphorus
- Magnesium
- Iodine
- Iron

Water-soluble vitamins

- B vitamins (thiamin, niacin, riboflavin, folic acid, B12)
- Vitamin C

Fat-soluble vitamins

- Vitamin A
- Vitamin D
- Vitamin E
- Vitamin K
Factors associated with nutritional impairment of HIV-infected women

- Poor energy intake
- Malabsorption
- Abnormal energy utilization
- Psychological and social stress
Module 2 — Unit 2

ANTENATAL PREPARATION

Unit 2

Antenatal preparation for lactation

prepared by
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Antenatal preparation for lactation

Introduction

Mothers need to prepare themselves during pregnancy for successful breastfeeding. The antenatal clinic setting presents opportunities for providing information and skills.

Objective

By the end of this unit the participants will be able to plan and implement an antenatal programme that supports mothers to breastfeed.

Group work

Divide the participants into groups of three and assign each group one of the 10 items listed below. Give the groups 10 minutes to prepare. Each group will then report (5 minutes each) to the others in a plenary session (50 minutes).

1. Develop a day’s menu for a pregnant woman who has only Ksh 100 for her food budget. The diet should contain four categories of food:
   - protein
   - energy
   - vitamins
   - minerals
   This diet should be based on commonly available foodstuffs.

2. Discuss preparing the nipple for breastfeeding.

3. Discuss positioning and attaching the baby on the breast. How does this affect production of prolactin and oxytocin hormones?

4. Discuss myths and beliefs that hinder breastfeeding.

5. What information should you provide on the advantages of breastfeeding?
6. How do you examine the breast in preparation for lactation?

7. What is the timing of the first breastfeeding?
   ⇒ Why is it important?
   ⇒ Is it feasible?
   ⇒ How long should it be?

8. Discuss breast hygiene.

9. How long should a feeding last and who decides the frequency of feeding?
   ⇒ The baby?
   ⇒ The mother?

Discuss the merits of demand feeding over timed feeding.
   ⇒ It encourages milk production.
   ⇒ It promotes breast health, as it prevents engorgement.
   ⇒ The baby feeds well when hungry.

10. If the mother becomes pregnant during lactation, what advice would you give her?

The output of this session should be used as part of the workplan for the team when participants return to their stations.

Infant attachment on the breast—practical exercise

1. Display figures 1 and 2, then figures 3 and 4. Let the participants tell you what the correct position for attachment on the breast is. (15 minutes)

   What difference do you see?

   Figure 1

   Figure 2
2. Visit the ANC, labour ward and postnatal wards. Observe and demonstrate correct attachment on the breast. Practise counseling mothers on breastfeeding. Have participants return to a plenary session and share their experiences. (75 minutes)

Time: 2 hours for the whole session
Practical exercise on infant attachment on the breast

What difference do you see?

Figure 1

Figure 2

Practical exercise on infant attachment on the breast

What difference do you see?

Figure 3

Figure 4
Unit 3

Common breastfeeding problems

prepared by
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Common breastfeeding problems

Introduction

Problems may arise during breastfeeding. Many of these are preventable with good maternal and health care practice. Some can be prevented by good antenatal preparation.

- Assistance by a knowledgeable health worker can stop progression to serious problems in many of the conditions we shall deal with.
- Throughout counseling, encourage mothers to seek help early.

Objective

By the end of this unit the participant should be able to assist a mother to prevent common breastfeeding problems and if they occur, be able to manage them appropriately.

Breast disease and HIV infection

A number of studies have now shown that breast disease significantly increases the risk of transmitting HIV through breast milk. Please review the material presented in module 1 on breast-milk transmission of HIV.

Specifically, breast engorgement, cracked nipples, mastitis and breast abscess all increase the risk of a woman transmitting HIV to her breastfeeding baby. Subclinical mastitis, characterized by elevated breast-milk sodium, is associated with breast-milk stasis, systemic and local infection, and micronutrient deficiencies. Subclinical mastitis is associated with elevated breast-milk HIV. Breast disease can be prevented through good breastfeeding technique that includes good attachment of the baby on the breast and frequent emptying of the breasts.

Vitamin A deficiency is also associated with elevated breast-milk HIV DNA; however, clinical trials of supplementing with vitamin A have failed to reduce the rate of mother-to-child transmission of HIV.
Nipple disorders

Flat and inverted nipples

- Examine and assess protractility by pressing on the areola.
- Reassure the mother.
- Plan extra help after the baby is born.

Position the baby properly (see figs. 1 and 3 on p. 34 and 35).
- Attachment should be on the areola.
- The mother should shape the nipple before putting baby on the breast as a way of facilitating attachment.
- If the breast is very full, expressing a little milk often stimulates the nipple sufficiently to allow proper attachment.

Generally:
- Flat nipples succeed with help.
- Inverted nipples are more problematic and should be referred to a trained lactation consultant.

Painful, cracked nipples

Discuss with the participants the possible causes.

The common causes of painful and cracked nipples are

⇒ poor position and attachment on the breast
⇒ localized candida infection

How do you manage painful, cracked nipples?

- The mother should be assisted to place the baby correctly on the breast.
- After a feed the mother should smear some breast milk on the breasts and then allow them to dry in the air. The area should be kept dry and airy. Exposure to direct sunshine may help.
- The woman should be advised to avoid abrasive creams and soaps.
Module 2 — Unit 3

COMMON BREASTFEEDING PROBLEMS

Ask the participants to list the different creams and soaps that their clients use for breast care.

• The breasts should not be washed before each feed because this accelerates the loss of the natural lubricating oils. Removing these natural lubricants makes the nipples more vulnerable to cracking. A bath once a day and use of clean underwear is adequate to maintain good hygiene.

Infected nipples

Candida is the most common infection associated with cracked nipples. Often the baby is also suffering from oral thrush. Both mother and baby should be treated. The baby should not be fed on the affected side, but rather encourage the mother to express milk to avoid engorgement. The mother can give the expressed breast milk to the baby after it is heat treated.

Breast disorders

Engorgement

Breast engorgement is caused by an unbalanced supply and demand for breast milk. Often the precipitating event is prolonged separation of the mother and baby. Painful nipples may also lead to infrequent feeding on the affected breast, leading to engorgement. Breast engorgement causes subclinical mastitis, a condition that is associated with increased breast-milk transmission of HIV.

Prevention of breast engorgement

• Initiate breastfeeding soon after delivery.
• Breastfeed the baby on demand.
• Avoid prelacteal feeds.
• Make sure that the baby is in a good position and is attached well on the breast.
Management of engorged breasts

- The first step is examination and assessment. The patient will complain of pain in the affected breast and the skin will be stretched tightly.
- The woman should be encouraged to feed her baby frequently to empty the breasts.
- Milk should be expressed from the breasts until the discomfort is relieved. The expressed breast milk can be used immediately or stored for later use.
- The breasts should be supported with a well-fitting brassiere until the pain subsides.
- Pain interferes with the let-down reflex thus preventing milk flow and therefore may aggravate the breast engorgement. Therefore women should be provided with analgesics to relieve the pain.

Painful swelling

Painful swelling is caused by

⇒ blocked ducts
⇒ mastitis
⇒ breast abscess

Blocked ducts

Blocked ducts frequently occur when a woman wears tight, restrictive clothing.

To manage the blocked ducts

- Frequently empty the breast. The woman should be shown how to express the milk before a feed to offer the nipple so that the baby can attach easily. The woman should express breast milk after a feed to relieve the engorged breast.
- When ducts are blocked, gentle massage will facilitate easy flow of the milk along the ducts.
- Counsel women to wear well-fitting underclothing to avoid blockage of the ducts.

Mastitis and abscess

Mastitis and abscesses usually are preceded by blocked duct or engorgement.
The cardinal sign of mastitis is a red, hot, tender breast.

Management of mastitis and breast abscess

- The breast should be emptied frequently. The woman should be shown how to express the milk.
- If there are blocked ducts, gentle massage will facilitate easy flow of the milk along the ducts.
- The woman should be given a course of broad-spectrum antibiotics for at least 10 days.
- An abscess will need to be drained. Such a patient should be referred to the district hospital for the procedure to be done under general anaesthesia.
- Effective analgesics should be provided for as long as the woman requires them.
- Warm or cold compresses can be used according to the woman’s preference to reduce the pain and discomfort.

Prevention of nipple and breast disease

The key strategies in preventing nipple and breast disease include

⇒ good latching-on technique
⇒ frequent emptying of the breast
⇒ prevention and management of pain
⇒ prompt treatment of infection

Do breast and nipple problems increase MTCT? Discuss.

What do you do with the expressed breast milk in this case?

The risk of transmitting HIV through breast milk is very high if the mother has nipple or breast disease. Most women do not know their HIV-infection status. In areas of high HIV prevalence among pregnant women, it may be better to express and boil the breast milk before feeding the infant until the breasts heal if a mother has cracked, bleeding nipples, mastitis or breast abscess.
Other breastfeeding problems

Not enough milk

State:

The commonest reason that mothers give for adding complementary feeds to a child’s diet before the recommended time of 6 months is not having enough milk. Often this is a perceived problem, not a real one. In such a situation, you need to establish if the problem is perceived or real.

Assess by taking history.

What are the reasons that mothers give for feeling that they do not have enough milk? Ask participants to write down the causes they know.

Some of the commonly cited reasons why a mother feels she does not have enough milk have very rational physiological explanations.

- Baby cries a lot: The baby may be suffering from colic or there may be some other cause of discomfort.
- Baby feeds very frequently: This is normal. Breast milk is more easily digested than other milk. The baby will wake up to feed about every three hours. Babies go through episodes of rapid growth called growth spurts. During a growth spurt the baby will feed more frequently to meet the increased requirements for growth. A mother’s lack of knowledge of how frequently a baby needs to feed may make her worry that her baby is not receiving enough milk.
- Breasts feel flabby: Early in lactation the breasts feel full because blood flow to the breasts increases. Later the breasts feel soft. The amount of milk in the breasts cannot be gauged by the texture of the breasts.

How do you judge if there is enough milk?

- We can judge whether babies are receiving enough milk by how frequently they wet themselves. Normally this is 8 to 10 times in a 24-hour period.
- A baby who is receiving an adequate amount of milk will gain weight rapidly; therefore, regular growth monitoring will help a mother breastfeed confidently.
How do you help the mother?

- Reassure her and explain the normal physiological changes that take place during lactation.
- Identify the cause of any difficulties and assist her in overcoming them.
- Encourage frequent feeding, emptying the breasts.
- Discourage her from giving supplements if she has introduced them before the recommended age of 6 months.

Combining work and breastfeeding

State that

- All women work.
- Work may separate them from their infants for a long period of day or night.

Ask participants to group types of work.

⇒ working in the house and home
⇒ self-employed but working outside the home
⇒ employed

Discuss how each of these groups can be assisted.

⇒ how to manage their time
⇒ negotiation with employer
⇒ what to give their infants while away from home
⇒ breast-milk expression and storage
⇒ instructions to baby minder

Discuss

⇒ maternity leave
⇒ nursing breaks
⇒ baby creches
Module 2 — Unit 3  COMMON BREASTFEEDING PROBLEMS

Common breastfeeding problems

Objective
By the end of this session the participant should be able to assist a mother to prevent common breastfeeding problems and if they occur provide the appropriate care.

Nipple disorders

- Flat and inverted nipples
- Painful and cracked nipples
- Infected nipples

Breast disorders

- Engorgement
- Painful swelling
- Blocked ducts
- Mastitis and abscess
Module 2 — Unit 3 COMMON BREASTFEEDING PROBLEMS

Prevention of nipple and breast disease

- Good latching-on technique
- Frequent emptying of the breasts
- Prevention and management of pain
- Prompt treatment of infection

Other breastfeeding problems

- Not enough milk
- Working mothers
Unit 4

International infant feeding codes and policies, and 10 steps for promoting breastfeeding

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International infant feeding codes and policies, and 10 steps for promoting breastfeeding

Summary of the international code

The International Code of Marketing of Breast-Milk Substitutes (reproduced in annex 1, p. 65) seeks to encourage and protect breastfeeding and to control marketing practices so they do not inappropriately promote products for artificial feeding. The code applies to artificial milk for babies and to other products used to feed babies, especially when they are meant for use in a feeding bottle. The code also applies to feeding bottles and teats. We have seen in the discussions in the previous section that good breastfeeding practice is essential for the health of the baby. Poor breastfeeding practice that leads to the development of breast and nipple disease and mixed feeding are dangerous for the infant on an HIV-infected mother because they increase the likelihood of breast-milk transmission of HIV. Since most women do not know their HIV-infection status, it is imperative that we promote good breastfeeding practice universally.

Objective

By the end of this unit the learner should be familiar with

⇒ the international code on the marketing of breast-milk substitutes
⇒ 10 steps to successful breastfeeding
⇒ international guidelines on feeding infants of HIV-1-infected women
⇒ the Kenyan infant feeding policy and guidelines

International code on marketing breast-milk substitutes

The infant feeding code includes 10 important provisions:

⇒ no advertising of these products to the public
⇒ no free samples to mothers
⇒ no promotion of products in health care facilities
⇒ no companies to advise mothers
⇒ no gifts or personal samples to health workers
⇒ no words or pictures idealizing artificial feeding, including pictures of infants or text about the products
⇒ scientific and factual information to health workers
⇒ all information on artificial infant feeding, including labels, to explain the benefits of breastfeeding and the costs and hazards associated with artificial feeding
⇒ no promotion of unsuitable products such as sweetened condensed milk
⇒ quality of all products high, and taking into account climate and storage conditions of the country in which they are used

A code and a breastfeeding policy are useful only if they are implemented. Operational research work has helped identify strategies that can be used in promoting good breastfeeding practice. These are called the 10 steps to successful breastfeeding. We will now discuss each of these steps and identify the ways in which they can be used to promote successful breastfeeding practice.

Scientific basis for the 10 steps to successful breastfeeding

Step 1— Have a written breastfeeding policy that is routinely communicated to all health care staff

Why have a policy?
• It requires a course of action and provides guidance.
• It helps establish consistent care for mothers and babies.

How should it be presented?
• It should be written in the most commonly used language.
• It should be available to all staff caring for mothers and babies.
• It should be displayed in areas where mothers and babies are cared for.

Step 2— Train all health care staff in the skills necessary to implement this policy

Areas of knowledge to emphasize
• Explain the advantages of breastfeeding.
• Explain the risks of artificial feeding.
• Explain the mechanisms of lactation and suckling.
• Show how to help mothers initiate and sustain breastfeeding.
• Show how to carry out a breastfeed.
• Explain how to resolve breastfeeding difficulties.
• Describe hospital breastfeeding policies and practices.

Step 3— Inform all pregnant women about the benefits of breastfeeding

What should prenatal education include?
• It should emphasize the importance of exclusive breastfeeding.
• It should explain the risks of artificial feeding and use of bottles and pacifiers, soothers, teats, nipples.
• It should not include group education on formula preparation.

Step 4— Help mothers initiate breastfeeding within half an hour of birth

Why should we initiate early feeding for the newborn?
• It increases the overall duration of breastfeeding.
• It allows skin-to-skin contact for warmth and bonding of the baby with the mother.
• It provides colostrum for the baby’s first immunization.
• It takes advantage of the first hour of alertness.
• The baby learns to suckle more effectively.
Step 5— Show mothers how to breastfeed and how to maintain lactation even if they are separated from their infants

Supply and demand

- Milk removal stimulates increased production.
- The amount of breast milk removed at each feed determines the rate at which milk will be produced in the next few hours.
- Milk removal must be continued during separation to maintain supply.

Step 6— Give newborns no food or drink other than breast milk unless medically indicated

What is the impact of routine formula supplementation?

- It decreases the frequency or efficiency of suckling.
- It decreases the amount of milk removed from the breast.
- It delays milk production or reduces the milk supply from the breast.
- Some infants have difficulty attaching to the breast if they receive formula by bottle.

Medically indicated exception for breastfeeding

There are exceptions during which the infant may require other fluids or food in addition to or in place of breast milk. The feeding programme of these babies should be determined by qualified professionals on an individual basis.

Step 7— Rooming in

A hospital arrangement where the mother and baby stay in the same room day and night allows unlimited contact between mother and baby.

Why should babies room in?

- It reduces costs.
- It requires minimum equipment.
- It requires no additional personnel.
- It reduces infection.
• It helps establish and maintain breastfeeding.
• It facilitates the bonding process.

Step 8— Encourage breastfeeding on demand

What is breastfeeding on demand?
Breastfeeding on demand means breastfeeding whenever the baby or mother wants, with no restrictions on the length or frequency of breastfeeds.

Why on-demand breastfeeding?
• It facilitates earlier passage of meconium.
• It minimizes weight loss in the first few days of life.
• Breast-milk flow is established sooner.
• The volume of milk intake by day 3 is larger.
• It lowers the incidence of jaundice in the newborn.

Step 9— Give no artificial feeds or pacifiers (also called dummies and soothers) to breastfeeding babies

Step 10—The key to best breastfeeding practices is continued day-to-day support for the breastfeeding mother within her home and community

What do we mean by breastfeeding support?
⇒ early postnatal or clinical checkup
⇒ home visits
⇒ telephone calls
⇒ community services such as outpatient breastfeeding clinics
⇒ peer counseling programmes
⇒ mother support groups—help set up new groups and establish a working relationship with existing groups
⇒ family support systems
Types of breastfeeding support groups

- Traditional
  ⇒ extended family
  ⇒ culturally defined groups
  ⇒ village women
- Modern (non-traditional groups)
  ⇒ initiated by mothers themselves
  ⇒ initiated by concerned professionals
- Government planned
  ⇒ networks of national development groups, clubs, and so on
  ⇒ health services, especially primary health care and trained traditional birth attendants

Hospitals that practice the 10 steps to successful breastfeeding are considered to be baby-friendly institutions.

Discuss the Kenyan infant feeding policy, given in annex 2, p. 75–76. How consistent is it with the 10 steps to successful breastfeeding?

Policy guidelines for feeding infants of HIV-infected women

Review WHO guidelines in annex 3 p. 77 with the participants and emphasize the elements of establishing a breastfeeding policy.

How does the Kenya infant feeding policy address feeding for infants of HIV-infected women? Review the Kenya guidelines in annex 2.

State: Infant feeding recommendations for babies of HIV-infected women are not an excuse to violate the infant feeding code.
Summary of the international code

- The code seeks to encourage and protect breastfeeding and to control inappropriate marketing practices used to promote products for artificial feeding.
- The code applies to artificial milk for babies and to other products used to feed babies, especially when they are marketed for use in a feeding bottle. The code also applies to feeding bottles and teats.

Objectives

By the end of this unit the learner should be familiar with
- The international code on the marketing of breast-milk substitutes
- 10 steps to successful breastfeeding
- International guidelines on feeding infants of HIV-1 infected women
- The Kenyan infant feeding policy and guidelines

10 provisions of the international code on infant feeding (1)

- No advertising of all these products to the public
- No free samples to mothers
- No promotion of products in health care facilities
- No company nurses to advise mothers
10 provisions of the international code on infant feeding (2)

- No gifts or personal samples to health workers
- No words or pictures idealizing artificial feeding, including pictures of infants or text about the products
- Information to health workers scientific and factual

10 provisions of the international code on infant feeding (3)

- All information on artificial infant feeding including the labels, explain the benefits of breastfeeding and the costs and hazards associated with artificial feeding
- Unsuitable products such as sweetened condensed milk not to be promoted for babies

10 provisions of the international code on infant feeding (4)

- All products to be of high quality, and taking into account climate and storage conditions of the country where they are used
Step 1 to successful breastfeeding

Have a written breastfeeding policy that is routinely communicated to all health care staff.

Step 2 to successful breastfeeding

Train all health-care staff in the skills necessary to implement this policy.

Step 3 to successful breastfeeding

Inform all pregnant women about the benefits and management of breastfeeding.
Step 4 to successful breastfeeding

Help mothers initiate breastfeeding within half an hour of birth.

Step 5 to successful breastfeeding

Show mothers how to breastfeed and how to maintain lactation even if they are separated from their infants.

Step 6 to successful breastfeeding

Give newborn infants no food or drink other than breast milk unless medically indicated.
Step 7 to successful Breastfeeding

Rooming in—this is a hospital arrangement where mother and baby stay in the same room day and night, allowing unlimited contact between mother and infant.

Step 8 to successful breastfeeding

Encourage breastfeeding on demand.

Step 9 to successful breastfeeding

Give no artificial teats or pacifiers (also called dummies and soothers) to breastfeeding infants.
Step 10 to successful breastfeeding

The key to best breastfeeding practices is continued day-to-day support for the breastfeeding mother within her home and community.
Annex 1
International code of marketing of breast-milk substitutes

Annex 2
National policy infant feeding practices: summary statement and guidelines

Annex 3
New data on the prevention of mother-to-child transmission of HIV and their policy implications
ANNEX 1

International code of marketing of breast-milk substitutes

Preamble

The Member States of the World Health Organization:

AFFIRMING the right of every child and every lactating woman to be adequately nourished as a means of attaining and maintaining health;

RECOGNIZING that infant malnutrition is part of the wider problems of lack of education, poverty and social injustice;

RECOGNIZING that the health of infants and young children cannot be isolated from the health and nutrition of women, their socio-economic status and their roles as mothers;

CONSCIOUS that breastfeeding is an unequalled way of providing ideal food for the healthy growth and development of infants; that it forms a unique, biological and emotional basis for the health of both mother and child; that the anti-infective properties of breast milk help to protect infants against disease; and that there is an important relationship between breastfeeding and child spacing;

RECOGNIZING that the encouragement and protection of breastfeeding is an important part of the health, nutrition and other social measures required to promote healthy growth and development of infants and young children; and that breastfeeding is an important aspect of primary health care;

CONSIDERING that when mothers do not breastfeed, or only do so partially, there is a legitimate market for infant formula and for suitable ingredients from which to prepare it; that all these products should accordingly be made accessible to those who need them, through commercial or non-commercial distribution systems; and that they should not be marketed or distributed in ways that interfere with the protection and promotion of breastfeeding;

RECOGNIZING further that inappropriate infant feeding practices lead to infant malnutrition, morbidity and mortality in all countries, and that improper practices in the marketing of breast-milk substitutes and related products can contribute to these major public health problems;

CONVINCED that it is important, for infants to receive appropriate complementary foods, usually when the infant reaches four to six months of age, and that every effort should be made to use locally available foods; and convinced, nevertheless, that such complementary foods should not be used as breast-milk substitutes;

APPRECIATING that there are a number of social and economic factors affecting breastfeeding, and that accordingly, governments should develop social support systems to protect, facilitate and encourage it, and that they should create an environment that fosters breastfeeding, provides appropriate family and community support, and protects mothers from factors that inhibit breastfeeding;

AFFIRMING that health care systems and the health professionals and other health workers serving in them have an essential role to play in guiding infant feeding practices, encouraging and facilitating breastfeeding, and providing objective and consistent advice to mothers and families about the superior value of breastfeeding, or, where needed, on the proper use of infant formula, whether manufactured industrially or home prepared;

AFFIRMING further that educational systems and other social services should be involved in the protection and promotion of breastfeeding and in the appropriate use of complementary foods;
AWARE that families, communities, women’s organizations and other non-governmental organizations have a special role to play in the protection and promotion of breastfeeding and in ensuring the support needed by pregnant women and mothers of infants and young children, whether breastfeeding or not;

AFFIRMING the need for governments, organizations of the United Nations system, non-governmental organizations, experts in various related disciplines, consumer groups and industry to cooperate in activities aimed at the improvement of maternal, infant and young child health and nutrition;

RECOGNIZING that governments should undertake a variety of health, nutrition and other social measures to promote healthy growth and development of infants and young children, and that this Code concerns only one aspect of these measures;

CONSIDERING that manufacturers and distributors of breast-milk substitutes have an important and constructive role to play in relation to breastfeeding and in the promotion of the aim of this Code and its proper implementation;

AFFIRMING that governments are called upon to take action appropriate to their social and legislative framework and their overall development objectives to give effect to the principles and aim of this Code, including the enactment of legislation, regulations or other suitable measures;

BELIEVING that, in the light of the foregoing considerations, and in view of the vulnerability of infants in the early months of life and the risks involved in inappropriate feeding practices, including the unnecessary and improper use of breast-milk substitutes, the marketing of breast-milk substitutes requires special treatment, which makes usual marketing practices unsuitable for these products;

THEREFORE:

The Member States hereby agree the following articles which are recommended as a basis for action.

**Article 1: Aim of the Code**

The aim of this Code is to contribute to the provision of safe and adequate nutrition for infants, by the protection and promotion of breastfeeding, and by ensuring the proper use of breast-milk substitutes, when these are necessary, on the basis of adequate information and through appropriate marketing and distribution.

**Article 2: Scope of the Code**

The Code applies to the marketing, and practices related thereto, of the following products: breast-milk substitutes, including infant formula; other milk products, foods and beverages, including bottled complementary foods, when marketed or otherwise represented to be suitable, with or without modification, for use as a partial or total replacement of breast milk; feeding bottles; and teats. It also applies to their quality and availability, and to information concerning their use.

**Article 3: Definitions**

For the purposes of this Code:

Breast-milk substitute means any food being marketed or otherwise represented as a partial or total replacement for breast milk, whether or not suitable for that purpose.

Complementary food means any food, whether manufactured or locally prepared, suitable as a complement to breast milk or to infant formula, when either becomes insufficient to satisfy the nutritional requirements of the infant. Such food is also commonly called weaning foods or breast-milk supplements.
Container means any form of packaging of products for sale as a normal retail unit, including wrappers.

Distributor means a person, corporation or any other entity in the public or private sector engaged in the business (whether directly or indirectly) of marketing at the wholesale or retail level a product within the scope of this Code. A primary distributor is a manufacturer’s sales agent, representative, national distributor or broker.

Health care system means governmental, non-governmental or private institutions or organizations engaged, directly or indirectly, in health care for mothers, infants and pregnant women; and nurseries or child care institutions. It also includes health workers in private practice. For the purposes of this Code, the health care system does not include pharmacies or other established sales outlets.

Health worker means a person working in a component of such a health care system, whether professional or non-professional, including voluntary, unpaid workers.

Infant formula means a breast-milk substitute formulated industrially in accordance with applicable Codex Alimentarius standards, to satisfy the normal nutritional requirements of infants up to between four and six months of age, and adapted to their physiological characteristics. Infant formula may also be prepared at home, in which case it is described as home prepared.

Label means any tag, brand, mark, pictorial or other descriptive matter, written, printed, stencilled, marked, embossed or impressed on, or attached to, a container (see above) of any products within the scope of this Code.

Manufacturer means a corporation or other entity in the public or private sector engaged in the business or function (whether directly or through an agent or through an entity controlled by or under contract with it) of manufacturing a product within the scope of this Code.

Marketing means product promotion, distribution, selling, advertising, product public relations, and information services.

Marketing personnel means any persons whose functions involve the marketing of a product or products coming within the scope of this Code.

Samples means single or small quantities of a product provided without cost.

Supplies means quantities of a product provided for use over an extended period, free or at a low price, for social purposes, including those provided to families in need.

**Article 4: Information and education**

4.1 Governments, should have the responsibility to ensure that objective and consistent information is provided on infant and young child feeding for use by families and those involved in the field of infant and young child nutrition. This responsibility should cover either the planning, provision, design and dissemination of information or their control.

4.2 Informational and educational materials, whether written, audio or visual, dealing with the feeding of infants and intended to reach pregnant women and mothers of infants and young children, should include clear information on all the following points:

   a) the benefits and superiority of breastfeeding;
   b) maternal nutrition, and the preparation for and maintenance of breastfeeding;
   c) the negative effect on breastfeeding of introducing partial bottlefeeding;
   d) the difficulty of reversing the decision not to breastfeed; and,
   e) where needed, the proper use of infant formula, whether manufactured industrially or home prepared.
When such materials contain information about the use of infant formula, they should include the social and financial implications of its use; the health hazards of inappropriate foods or feeding methods; and in particular, the health hazards of unnecessary or improper use of infant formula and other breast-milk substitutes. Such materials should not use any pictures or text which may idealize the use of breast-milk substitutes.

4.3 Donations of informational or educational equipment or materials by manufacturers or distributors should be made only at the request and with the written approval of the appropriate government authority or within guidelines given by governments for this purpose. Such equipment or materials may bear the donating company’s name or logo, but should not refer to a proprietary product that is within the scope of this Code, and should be distributed only through the health care system.

Article 5: The general public and mothers

5.1 There should be no advertising or other form of promotion to the general public of products within the scope of this Code.

5.2 Manufacturers and distributors should not provide, directly or indirectly, to pregnant women, mothers or members of their families, samples of products within the scope of this Code.

5.3 In conformity with paragraphs 1 and 2 of this Article, there should be no point-of-sale advertising, giving of samples, or any other promotion device to induce sales directly to the consumer at the retail level, such as special displays, discount coupons, premiums, special sales, loss-leaders and tie-in sales, for products within the scope of this Code. This provision should not restrict the establishment of pricing policies and practices intended to provide products at lower prices on a long-term basis.

5.4 Manufacturers and distributors should not distribute to pregnant women or mothers of infants and young children any gifts of articles or utensils which may promote the use of breast-milk substitutes or bottle-feeding.

5.5 Marketing personnel, in their business capacity, should not seek direct or indirect contact, of any kind with pregnant women or with mothers of infants and young children.

Article 6: Health care systems

6.1 The health authorities in Member States should take appropriate measures to encourage and protect breastfeeding and promote the principles of this Code, and should give appropriate information and advice to health workers, in regard to their responsibilities, including the information specified in Article 4.2.

6.2 No facility of a health care system should be used for the purpose of promoting infant formula or other products within the scope of this Code. This Code does not, however, preclude the dissemination of information to health professionals as provided in Article 7.2.

6.3 Facilities of health care systems should not be used for the display of products within the scope of this Code, for placards or posters concerning such products, or for the distribution of material provided by a manufacturer or distributor other than that specified in Article 4.3.

6.4 The use by the health care system of professional service representatives, mothercraft nurses or similar personnel provided or paid for by manufacturers or distributors should not be permitted.

6.5 Feeding with infant formula, whether manufactured or home prepared, should be demonstrated only by health workers or other community workers if necessary; and only to the mothers or family members who need to use it; and the information given should include a clear explanation of the hazards of improper use.
6.6 Donations or low-price sales to institutions or organizations of supplies of infant formula or other products within the scope of this Code, whether for use in the institutions or for distribution outside them, may be made. Such supplies should only be used or distributed for infants who have to be fed on breast-milk substitutes. If these supplies are distributed for use outside the institutions, this should be done only by the institutions or organizations concerned. Such donations or low-priced sales should not be used by manufacturers or distributors as a sales inducement.

6.7 Where donated supplies of infant formula or other products within the scope of this Code are distributed outside an institution, the institution or organization should take steps to ensure that supplies can be continued as long as the infants concerned need them. Donors, as well as institutions or organizations concerned, should bear in mind this responsibility.

6.8 Equipment and materials, in addition to those referred to in Article 4.3, donated to a health care system may bear a company’s name or logo but should not refer to any proprietary product within the scope of this Code.

Article 7: Health workers

7.1 Health workers should encourage and protect breastfeeding; and those who are concerned in particular with maternal and infant nutrition should make themselves familiar with their responsibilities under this Code, including the information specified in Article 4.2.

7.2 Information provided by manufacturers and distributors to health professionals regarding products within the scope of this Code should be restricted to scientific and factual matters, and such information should not imply or create a belief that bottle feeding is equivalent or superior to breastfeeding. It should also include the information specified in Article 4.2.

7.3 No financial or material inducements to promote products within the scope of this Code should be offered by manufacturers or distributors to health workers or members of their families, nor should these be accepted by health workers or members of their families.

7.4 Samples of infant formula or other products within the scope of this Code, or of equipment or utensils for their preparation or use, should not be provided to health workers except when necessary for the purpose of professional evaluation or research at the institutional level. Health workers should not give samples of infant formula to pregnant women, mothers of infants and young children, or members of their families.

7.5 Manufacturers and distributors of products within the scope of this Code should disclose to the institution to which a recipient health worker is affiliated any contribution made to him or on his behalf for fellowships, study tours, research grants, attendance at professional conferences, or the like. Similar disclosures should be made by the recipient.

Article 8: Persons employed by manufacturers and distributors

8.1 In systems of sales incentives for sales personnel, the volume of sales of products within the scope of this Code should not be included in the calculation of bonuses, nor should quotas be set specifically for sales of these products. This should not be understood to prevent the payment of bonuses based on the overall sales by a company of other products marketed by it.

8.2 Personnel employed in marketing products within the scope of this Code should not, as part of their job responsibilities, perform education functions in relation to pregnant women or mothers of infants and young children. This should not be understood as preventing such personnel from being used for other
functions by the health care system at the request and with the written approval of the appropriate authority
of the government concerned.

Article 9: Labelling

9.1 Labels should be designed to provide the necessary information about the appropriate use of the product,
and so as not to discourage breastfeeding.

9.2 Manufacturers and distributors of infant formula should ensure that each container has a clear, conspicuous,
and easily readable and understandable message printed on it, or on a label which cannot readily become
separated from it, in an appropriate language, which includes all the following points:

a) the words Important Notice or their equivalent;
b) a statement of the superiority of breastfeeding;
c) a statement that the product should be used only on the advice of a health worker as to the need for
   its use and the proper method of use;
d) instructions for appropriate preparation, and a warning against the health hazards of inappropriate
   preparation.

Neither the container nor the label should have pictures of infants, nor should they have other pictures or text
which may idealize the use of infant formula. They may, however, have graphics for easy identification of the
product as a breast-milk substitute and for illustrating methods of preparation. The terms humanized, maternalized
or similar terms should not be used. Inserts giving additional information about the product and its proper use,
subject to the above conditions, may be included in the package or retail unit. When labels give instructions for
modifying a product into infant formula, the above should apply.

9.3 Food products within the scope of this Code marketed for infant feeding, which do not meet all the
requirements of an infant formula but which can be modified to do so, should carry on the label that the
unmodified product should not be the sole source of nourishment of an infant. Since sweetened condensed
milk is not suitable for infant feeding, nor for use as a main ingredient of infant formula, its label should not
contain purported instructions on how to modify it for that purpose.

9.4 The label of food products within the scope of this Code should also state all the following points:

a) the ingredients used;
b) the composition/analysis of the product;
c) the storage conditions required; and

d) the batch number, and the date before which the product is to be consumed, taking into account the
   climatic and storage conditions of the country concerned.

Article 10: Quality

10.1 The quality of products is an essential element for the protection of the health of infants and therefore
should be of a high recognized standard.

10.2 Food products within the scope of this Code should, when sold or otherwise distributed, meet applicable
standards recommended by the Codex Alimentarius Commission, and also the Codex Code of Hygienic
Practice for Foods for Infants and Children.
Article 11: Implementation and monitoring

11.1 Governments should take action to give effect to the principles and aim of this Code as appropriate to their social and legislative framework, including the adoption of national legislation, regulations or other suitable measures. For this purpose, governments should seek, when necessary, the cooperation of WHO, UNICEF and other agencies of the United Nations system. National policies and measures, including laws and regulations, which are adopted to give effect to the principles and aim of this Code should be publicly stated, and should apply on the same basis to all those involved in the manufacture and marketing of products within the scope of this Code.

11.2 Monitoring the application of this Code lies with governments acting individually and collectively through the World Health Organization as provided in paragraphs 6 and 7 of this Article. The manufacturers and distributors of products within the scope of this Code and appropriate non-governmental organizations, professional groups, and consumer organizations should collaborate with governments to this end.

11.3 Independently of any other measures taken for implementation of this Code, manufacturers and distributors of products within the scope of this Code should regard themselves as responsible for monitoring their marketing practices, according to the principles and aim of this Code, and for taking steps to ensure that their conduct at every level conforms to them.

11.4 Non-governmental organizations, professional groups, institutions and individuals concerned should have the responsibility of drawing the attention of manufacturers or distributors to activities which are incompatible with the principles and aim of this Code, so that appropriate action can be taken. The appropriate governmental authority should also be informed.

11.5 Manufacturers and primary distributors of products within the scope of this Code should apprise each member of their marketing personnel of the Code and of their responsibilities under it.

11.6 In accordance with Article 62 of the Constitution of the World Health Organization, Member States shall communicate annually to the Director-General information on action taken, to give effect to the principles and aim of this Code.

11.7 The Director-General shall report in even years to the World Health Assembly on the status of implementation of the Code; and shall, on request, provide technical support to Member States preparing national legislation or regulations, or taking other appropriate measures in implementation and furtherance of the principles and aim of this Code.

Infant and young child feeding

The Thirty-ninth World Health Assembly,

Recalling resolutions WHA27.43, WHA31.47, WHA33.32, WHA34.22, WHA35.26 and WHA37.30 which dealt with infant and young child feeding;

Having considered the progress and evaluation report on infant and young child nutrition;

Recognizing that the implementation of the International Code of Marketing of Breast-milk Substitutes is an important contribution to healthy infant and young child feeding in all countries;

Aware that today, five years after the adoption of the International Code, many Member States have made substantial efforts to implement it, but that many products unsuitable for infant feeding are nonetheless being promoted and used for this purpose; and that sustained and concerted efforts will therefore continue to be
necessary to achieve full implementation of and compliance with the International Code as well as the cessation of the marketing of unsuitable products and the improper promotion of breast-milk substitutes;

Noting with great satisfaction the Guidelines concerning the main health and socio-economic circumstances in which infants have to be fed on breast-milk substitutes, in the context of Article 6, paragraph 6, of the International Code;

Noting further the statement in the Guidelines, paragraph 47: Since the large majority of infants born in maternity wards and hospitals are full term, they require no nourishment other than colostrum during their first 24–48 hours of life—the amount of time often spent by a mother and her infant in such an institutional setting. Only small quantities of breast-milk substitutes are ordinarily required to meet the needs of a minority of infants in these facilities, and they should only be available in ways that do not interfere with the protection and promotion of breastfeeding for the majority;

1. ENDORSES the report of the Director-General;

2. URGES Member States:

   1) to implement the Code if they have not yet done so;

   2) to ensure that the practices and procedures of their health care systems are consistent with the principles and aim of the International Code;

   3) to make the fullest use of all concerned parties—health professional bodies, non-governmental organizations, consumer organizations, manufacturers and distributors—generally, in protecting and promoting breastfeeding and, specifically, in implementing the Code and monitoring its implementation and compliance with its provisions;

   4) to seek the cooperation of manufacturers and distributors of products within the scope of Article 2 of the Code in providing all information considered necessary for monitoring the implementation of the Code;

   5) to provide the Director-General with complete and detailed information on the implementation of the Code;

   6) to ensure that the small amounts of breast-milk substitutes needed for the minority of infants who require them in maternity wards and hospitals are made available through the normal procurement channels and not through free or subsidized supplies;

3. REQUESTS the Director-General:

   1) to propose a simplified and standardized form for use by Member States to facilitate the monitoring and evaluation by them of their implementation of the Code and reporting thereon to WHO, as well as the preparation by WHO of a consolidated report covering each of the articles of the Code;

   2) to specifically direct the attention of Member States and other interested parties to the following:

      a) any food or drink given before complementary feeding is nutritionally required may interfere with the initiation or maintenance of breastfeeding and therefore should not be promoted nor encouraged for use by infants during this period;

      b) the practice being introduced in some countries of providing infants with specially formulated milks (so-called follow-up milks) is not necessary.
Infant and young child nutrition

The Forty-seventh World Health Assembly,

Having considered the report by the Director-General on infant and young child nutrition;

Recalling resolutions WHA33.32, WHA34.22, WHA35.26, WHA37.30, WHA39.28, WHA41.11, WHA43.3, WHA45.34 and WHA46.7 concerning infant and young child nutrition, appropriate feeding practices and related questions;

Reaffirming its support for all these resolutions and reiterating the recommendations to Member States contained therein;

Bearing in mind the superiority of breast milk as the biological norm for the nourishment of infants, and that a deviation from this norm is associated with increased risks to the health of infants and mothers;

1. THANKS the Director-General for his report;

2. URGES Member States to take the following measures:

1) to promote sound infant and young child nutrition, in keeping with their commitment to the World Declaration and Plan of Action for Nutrition, through coherent effective intersectoral action, including:
   a) increasing awareness among health personnel, non-governmental organizations, communities and the general public of the importance of breastfeeding and its superiority to any other infant feeding method;
   b) supporting mothers in their choice to breastfeed by removing obstacles and preventing interference that they may face in health services, the workplace, or the community;
   c) ensuring that all health personnel concerned are trained in appropriate infant and young child feeding practices, including the application of the principles laid down in the joint WHO/UNICEF statement on breastfeeding and the role of maternity services;
   d) fostering appropriate complementary feeding practices from the age of about six months, emphasizing continued breastfeeding and frequent feeding with safe and adequate amounts of local foods;

2) to ensure that there are no donations of free or subsidized supplies of breast-milk substitutes and other products covered by the International Code of Marketing of Breast-milk Substitutes in any part of the health care system;

3) to exercise extreme caution when planning, implementing or supporting emergency relief operations, by protecting, promoting and supporting breastfeeding for infants, and ensuring that donated supplies of breast-milk substitutes or other products covered by the scope of the International Code be given only if all the following conditions apply:
   a) infants have to be fed on breast-milk substitutes, as outlined in the guidelines concerning the main health and socio-economic circumstances in which infants have to be fed on breast-milk substitutes,
   b) the supply is continued for as long as the infants concerned need it;
   c) the supply is not used as a sales inducement;

4) to inform the labour sector and employers’ and workers’ organizations about the multiple benefits of breastfeeding for infants and mothers and the implications for maternity protection in the workplace;
3. REQUESTS the Director-General:

1) to use his good offices for cooperation with all parties concerned in giving effect to this and related resolutions of the Health Assembly in their entirety;

2) to complete development of a comprehensive global approach and programme of action to strengthen national capacities for improving infant and young child feeding practices, including the development of methods and criteria for national assessment of breastfeeding trends and practices;

3) to support Member States, at their request, in monitoring infant and young child feeding practices and trends in health facilities and households, in keeping with new standard breastfeeding indicators;

4) to urge Member States to join in the Baby-friendly Hospital Initiative and to support them, at their request, in implementing this Initiative, particularly in their efforts to improve educational curricula and in-service training for all health and administrative personnel concerned;

5) to increase and strengthen support to Member States, at their request, in giving effect to the principles and aim of the International Code and all relevant resolutions, and to advise Member States on a framework which they may use in monitoring their application, as appropriate to national circumstances;

6) to develop, in consultation with other concerned parties and as part of WHO’s normative function, guiding principles for the use in emergency situations of breast-milk substitutes or other products covered by the International Code which the competent authorities in Member States may use, in the light of national circumstances, to ensure the optimal infant feeding conditions;

7) to complete, in cooperation with selected research institutions, collection of revised reference data and the preparation of guidelines for their use and interpretation, so as to assess the growth of breastfed infants;

8) to seek additional technical and financial resources for intensifying WHO’s support to Member States in infant feeding and in the implementation of the International Code and subsequent relevant resolutions.
NATIONAL POLICY INFANT FEEDING PRACTICES
SUMMARY STATEMENT

Every facility providing Maternal and Child Health (MCH) services should:

1. Adhere to the National Infant Feeding Policy which should be routinely communicated to all health staff and strategically displayed;
2. Train all health care staff in skills necessary to implement this policy;
3. Provide information to all pregnant and lactating mothers and their partners on the benefits and management of breastfeeding;
4. Assist mothers to initiate breastfeeding within the first 30 minutes of birth;
5. Give newborn infants no food or drink other than breastmilk unless medically indicated (see specific guidelines on infants of HIV-infected mothers);
6. Show mothers how to breastfeed and maintain lactation even if they should be separated from their infants;
7. Practise rooming-in, allow infants to remain together with the mother 24 hours a day;
8. Encourage breastfeeding on demand;
9. Encourage and actively promote exclusive breastfeeding for infants up to six months;
10. Provide information and show mothers how to introduce appropriate and nutritious complementary foods to their infants from six months;
11. Encourage mothers to breastfeed for at least 24 months (see guidelines for HIV-infected mothers);
12. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from hospital or clinic;
13. Not accept any free samples and supplies of breast substitutes;
14. Not allow any publicity by the manufacturers or agents of breastmilk substitutes;
15. Not give any feeds using bottles of teats.

DR. RICHARD MUGA OGW, DSM
DIRECTOR OF MEDICAL SERVICES

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HIV AND INFANT FEEDING PRACTICES GUIDELINES

ALL MOTHERS
- Inform about the benefits of breastfeeding
- Prevent or manage breastfeeding problems*
- Discuss appropriate complementary feeding
- Promote good maternal nutrition and self care
- Provide vitamin A supplements, iron, folic acid and zinc
- Counsel on child spacing
- Treat infections promptly
- Reduce HIV infections
- Reduce risk of mother-to-child transmission (MTCT) of HIV
- Give information on voluntary counseling and testing

VOLUNTARY COUNSELING AND TESTING

HIV-NEGATIVE MOTHERS
- Reinforce risk reduction
- Promote breastfeeding

HIV-POSITIVE MOTHERS
- Give information on feeding options
- Supply information on cost of options
- Inform and teach skills on how to reduce or avoid MTCT
- Allow the mother and partner to make informed choice
- Provide appropriate antiretrovirals to prevent MTCT

MOTHERS NOT TESTED
- Promote and support breastfeeding
- Make information available on voluntary counseling and testing and encourage it
- Reinforce risk reduction **

HIV POSITIVE WHO CHOOSE TO BREASTFEED
- Support and encourage exclusive breastfeeding
- Prevent or manage breastfeeding problems
- Discourage breastfeeding if cracked nipples, mastitis or abscess
- Provide relevant antiretrovirals

HIV POSITIVE WHO CHOOSE NOT TO BREASTFEED
- Demonstrate safe preparation and storage of chosen milk
- Demonstrate cup and spoon feeding
- Counsel on the care of the breasts to avoid engorgement
- Provide reliable family planning material by 4 weeks

* Abscess, mastitis, breast and nipple disease
** Manage as HIV-positive women who have features of clinical AIDS
ANNEX 3

New data on the prevention of mother-to-child transmission of HIV and their policy implications

Conclusions and recommendations

WHO Technical Consultation on behalf of the UNFPA/UNICEF/WHO/UNAIDS Inter-Agency Task Team on Mother-to-Child Transmission of HIV


Introduction

Mother-to-child transmission of HIV is the most significant source of HIV infection in children below the age of 10 years. The strategy recommended by the United Nations agencies to prevent MTCT includes 1) the primary prevention of HIV infection among parents to be, 2) the prevention of unwanted pregnancies in HIV-infected women, and 3) the prevention of HIV transmission from HIV-infected women to their infants. While the best ways to prevent HIV infection in infants remain primary prevention of HIV infection and reduction of unwanted pregnancies among women who are infected with HIV, many HIV-infected women become pregnant. In 1994 a long and complex regimen of the antiretroviral drug Zidovudine (ZDV) taken five times daily from the 14th week of pregnancy and intravenously during labour was shown to reduce the risk of transmission from mother to child by two-thirds, from 26 to 8%. This regimen had little practical value in developing countries, and more appropriate short-course ZDV regimens starting later in pregnancy were evaluated and also shown to be effective. Other interventions shown to prevent transmission of HIV include elective caesarean section and the avoidance of breastfeeding. While these interventions have become standard practice in developed countries, they are not always practical or safe in resource-limited settings.

Following release of results in 1998 that a short-course ZDV regimen starting from 36 weeks of pregnancy reduced the rate of transmission of HIV by 50%, a comprehensive strategy for MTCT prevention was developed. Considerable experience has been obtained with pilot intervention projects, many initiated by UNICEF under the umbrella of the UN Inter-Agency Task Team on Mother-to-Child Transmission of HIV. The entry point to the interventions is voluntary counselling and testing (VCT) for HIV, followed by ZDV from 36 weeks and during labour to mothers who are HIV infected, and counselling on infant feeding options. More recent clinical trials have shown that other short-course ARV regimens using ZDV, the combination ZDV + Lamivudine (3TC), and Nevirapine are also effective in reducing the risk of transmission.

MTCT prevention interventions should not stand in isolation but be integrated where possible into existing health care infrastructures and reproductive health services. Moreover, the interventions should be seen as part of a wider response to HIV/AIDS, which includes expanding access to care and support for HIV-infected mothers and their families, including treatment of opportunistic infections and accelerating access to HIV treatment.

While the efficacy of ARV regimens in reducing the risk of HIV transmission is important, other issues need to be considered:

- **Practicality and effectiveness.** The selection process for enrolment and individual monitoring in clinical trials produces ideal conditions for which women can have access to the treatment and adhere to it.
under study. These ideal conditions are seldom achieved once the treatment is expanded to a wider population in implementation programmes, and the actual reduction in the rate of MTCT achieved (effectiveness) is likely to be less than that observed in clinical trials (efficacy). The effectiveness of antiretroviral regimens that are more practical and simpler to administer should be close to their efficacy observed from clinical trials while the effectiveness of regimens complex and difficult to administer may be considerably less.

- **Safety.** For the women and infants who are offered antiretroviral prophylaxis, the risks of exposure to one or more drugs must be balanced by the benefit of preventing transmission of a fatal infection to the infant. In randomized controlled trials, the incidence of adverse events can be compared between the treated and the untreated groups, providing good comparative data on safety. However, observational studies and long-term monitoring of exposed mothers and infants are important additional sources of information that better reflect the actual conditions under which the ARV regimens are used.

- **Drug resistance.** Drug resistance has been reported in some women exposed to short-course antiretroviral regimens used for preventing MTCT. The implications of such resistance are uncertain and need to be considered in the context of increasing access to ARV treatment for patients in developing countries.

There is continued concern that up to 20% of infants born to HIV-infected mothers may acquire HIV through breastfeeding, depending on its duration and other risk factors. Replacement feeding is the only way to completely avoid postnatal HIV transmission; however, this may not be possible in many locations in the developing world. Despite the risk of HIV transmission, breastfeeding provides appropriate nutrition, passively conveys protection against some micro-organisms including respiratory and gastrointestinal pathogens, and is more economical. Exclusive breastfeeding provides the infant’s complete nutritional needs up to the age of 4 to 6 months and delays the return of fertility, playing an important role in birth spacing. To protect breastfeeding from commercial influences, the World Health Assembly adopted the International Code of Marketing of Breast-Milk Substitutes, now implemented worldwide. UNICEF and WHO launched the Baby-Friendly Hospital Initiative to improve maternity services so that they protect, promote and support breastfeeding.

Breastfeeding remains the best source of nutrition for the great majority of infants and should continue to be promoted and supported among mothers who are not known to be HIV-infected. Implementation of the Code of Marketing in national legislation and regulations provides protection to all women and their infants, whether or not they are breastfed.

New information on MTCT prevention has emerged since WHO issued guidance on the choices of ARV regimens and the risks of HIV transmission through breast milk. Important new research data related to the long-term efficacy and safety of different ARV regimens, to the dynamics and clinical implications of viral resistance, and to the role of infant feeding practices were published or presented at the 13th International AIDS Conference in Durban, South Africa, in July 2000. In addition, considerable experience has accumulated over the past two years from pilot implementation of MTCT-prevention programmes in resource-limited settings. In particular, programme managers have identified problems implementing current recommendations on HIV and infant feeding and have asked for clarification.

On behalf of the Inter-Agency Task Team on MTCT, WHO’s Department of Reproductive Health and Research, in collaboration with the HIV/STI Initiative and the Department of Child and Adolescent Health, convened a Technical Consultation on new data on preventing MTCT and their policy implications. The
Objective was to review recent scientific data and update current recommendations on the provision of ARVs and infant feeding counselling. The Technical Consultation focused on these two components, although it was recognized that many other components are important for a comprehensive package for MTCT prevention.

**Objectives**

The specific objectives of the meeting were

- to review the most recent scientific data on the use of ARV regimens to prevent MTCT, including issues of efficacy, safety, drug resistance and factors affecting optimal choices of ARV regimens in different settings
- to consider developments and likely time frame for access to and use of antiretroviral drugs for the treatment of HIV infection in resource-limited settings and the likely impact that MTCT prevention programmes may have on the effectiveness of such treatments
- to review evidence on risks and benefits for mother and infant of breastfeeding, including exclusive breastfeeding, and of replacement feeding, and to consider issues in conveying complex information on risks and benefits of different feeding options to mothers, enabling their informed choice
- to review, and revise if necessary, existing UN agency policies on choices of ARV regimens and infant feeding guidelines and counselling in MTCT prevention programmes in resource-limited settings
- to list outstanding research questions on the prevention of MTCT using ARV regimens or through infant feeding

**Participants**

Participants included expert scientists and programme managers from the African region (11), Asia (2), Latin America (1), the Caribbean (1), Europe (4) and the USA (2), HIV-infected mothers (2), collaborating agency scientists (6), representatives from non-governmental organizations implementing MTCT prevention programmes (6) and UN agencies (UNAIDS, UNFPA, UNICEF, WHO).

**Background information**

Background papers that were prepared for the consultation, presented in plenary sessions and discussed in the subgroups, included

- Munjanja S. Antiretroviral regimens for the prevention of MTCT: the programmatic implications.
- Mofenson L, Munderi P. Safety of antiretroviral prophylaxis of perinatal transmission on HIV-infected pregnant women and their infants.
- Nájera R. MTCT and antiretroviral drug resistance.
- Fowler MG, Newell ML. Breastfeeding, HIV transmission and options in resource-poor settings.

These papers are available on the WHO and UNAIDS Web sites together with a summary of information presented during the discussion.

The conclusions and recommendations from this meeting follow. They will be reconsidered as new information becomes available.
Conclusions and recommendations on the use of antiretrovirals

Short-term efficacy of ARV prophylactic regimens
Several antiretroviral regimens evaluated in randomized controlled clinical trials showed short-term efficacy, as determined by infant infection status at 6–8 weeks. This reflects the reduction of in utero, intrapartum and early postpartum transmission.

- The drugs used in the effective antiretroviral prophylaxis regimens evaluated included Zidovudine (ZDV) alone, ZDV + Lamivudine (3TC), and Nevirapine.
- All regimens include an intrapartum component, with varying durations of antepartum or postpartum treatment or both.
- The most complex effective regimen includes antepartum, intrapartum, postpartum ZDV, while the simplest effective regimen includes single-dose intrapartum and postpartum Nevirapine.
- The mechanisms by which these regimens provide protection against mother-to-child HIV transmission include decrease of viral replication in the mother or prophylaxis of the infant during and after exposure to virus or both.

Long-term efficacy of ARV prophylactic regimens
Short-course ZDV, ZDV + 3TC, and Nevirapine have been evaluated in breastfeeding populations. Long-term efficacy as measured by infant infection status through 12 to 24 months has been demonstrated for short-course ZDV and Nevirapine regimens, showing that the early reduction in HIV transmission persists despite continued exposure to HIV during breastfeeding. Analysis of long-term efficacy of the ZDV + 3TC regimens is in progress.

Safety of ARV prophylactic regimens
Short-term safety and tolerance of the effective antiretroviral prophylactic regimens has been demonstrated in all the controlled clinical trials, while collection of long-term safety data is ongoing.

- In the controlled clinical trials, the effective antiretroviral prophylaxis regimens have not been associated with an excess of severe adverse events (including mortality) compared with the control arms in HIV-infected women or their children.
- Normal growth, neurologic development and immunologic parameters have been demonstrated in industrialized countries in uninfected children with in utero and neonatal exposure to ZDV compared with those without such exposure.
- HIV-related disease progression in mothers does not appear to be altered by receipt of prophylactic antiretroviral regimens.
- There have not been significant differences in HIV disease progression or mortality in children who became infected despite receipt of prophylaxis compared with infants who became infected in the control arms in the clinical trials.
- In the randomized, controlled clinical trials the only adverse effect attributable to drug exposure was mild transient anaemia in infants receiving ZDV-containing regimens.
- Mitochondrial dysfunction has been reported to occur in a small number of infants in France exposed in utero or neonatally to nucleoside reverse transcriptase inhibitor (ZDV or ZDV/3TC), but no similar findings were reported following an extensive review of deaths in a cohort of 16,000 infants in the USA, nor in the PETRA study. However, neither of these studies did specific laboratory assessment for mitochondrial dysfunction. Non-nucleoside reverse transcriptase inhibitor drugs, like Nevirapine, do not inhibit mitochondrial DNA polymerase and therefore should not be associated with such toxicity.
Conclusion: The WHO Technical Consultation concluded that benefit of these drugs in reducing mother-to-child HIV transmission greatly outweighs any potential adverse effects of drug exposure.

Selection of resistant viral populations
Selection for pre-existing resistant viral populations or development of new mutations may occur with all antiretroviral drugs or drug regimens that do not fully suppress viral replication. However, this is more likely to occur rapidly with drugs in which a single mutation is associated with development of drug resistance; such drugs include 3TC (with and without concomitant ZDV treatment) and Nevirapine. Virus containing drug-resistant mutations decreases in amount once antiretroviral drug prophylaxis is discontinued, and wild-type virus dominates. However, the mutant virus may remain present in an individual at very low levels.

- This could decrease antiviral effectiveness of future treatment with antiretroviral regimens that contain the same drug, or drugs within the same class, as that used for prophylaxis.
- It is unknown if such low-level drug resistance would affect the efficacy of the antiretroviral prophylaxis regimen if used in a subsequent pregnancy.
- There is currently no evidence that drug-resistant viruses are more transmissible than non-resistant viruses.
- There are currently no data to indicate that drug-resistant viruses are more virulent than non-resistant viruses.

Conclusion: The WHO Technical Consultation concluded that the benefit of decreasing mother-to-child HIV transmission with these antiretroviral drug prophylaxis regimens greatly outweighs concerns related to development of drug resistance.

Women who receive a suboptimal antepartum regimen
For antiretroviral prophylaxis regimens that include an antepartum component, the minimum duration of antepartum treatment necessary for protection is not defined. However, it is likely that a major mechanism for effective antepartum prophylaxis is reduction in maternal viral load, which is likely to require at least 1 to 2 weeks of treatment.

Recommendation: For women receiving prophylactic regimens that include an antepartum component and who have received less than 2 weeks of ZDV antepartum treatment, prophylaxis with 6 weeks ZDV to the infant, intrapartum and postpartum ZDV + 3TC, or the two-dose Nevirapine regimen may be considered.

Scaling up MTCT-prevention programmes and choice of ARV regimen
Since the last WHO Technical Consultations on prevention of mother-to-child HIV transmission with antiretroviral prophylaxis, important new data have become available related to long-term efficacy and safety of these regimens. Additionally, longitudinal assessment has demonstrated that antiretroviral resistant virus detected at 6 weeks postpartum was no longer detectable when reassessed at 12 months postpartum. Furthermore, the presence of detectable resistant virus was not associated with either increased mother-to-child HIV transmission or increased mortality in infants who became infected despite prophylaxis.

Conclusion: The WHO Technical Consultation concluded that implementation of any of the antiretroviral prophylaxis regimens shown to be effective in randomized clinical trials (ZDV, ZDV + 3TC, or Nevirapine regimens) can be recommended for general implementation. There is currently no justification to restrict use of any of these regimens to pilot project or research settings.
Recommendation: The local choice for the antiretroviral prophylactic regimen to include in the standard package of care should be determined by issues of feasibility, efficacy and cost. Considerations that contribute to decisions regarding the composition of the standard prophylactic package include proportion of women attending antenatal care, time of initiation of antenatal care, frequency of antenatal visits, type of HIV voluntary counselling and testing available, logistics and acceptability of antiretroviral prophylaxis administration, and cost of drugs.

Recommendation: The prevention of mother-to-child HIV transmission should be part of the minimum standard package of care for women who are known to be HIV infected and their infants.

Conclusions and recommendations regarding infant feeding

Risks of breastfeeding and replacement feeding

The benefits of breastfeeding are greatest in the first 6 months of life (optimal nutrition, reduced morbidity and mortality due to infections other than HIV, and delayed return of fertility).

Exclusive breastfeeding during the first 4 to 6 months of life carries greater benefits than mixed feeding with respect to morbidity and mortality from infectious diseases other than HIV.

Although breastfeeding no longer provides all nutritional requirements after 6 months, breastfeeding continues to offer protection against serious infections and to provide significant nutrition to the infant (half or more of nutritional requirements in the second 6 months of life, and up to one-third in the 2nd year).

Replacement feeding carries an increased risk of morbidity and mortality associated with malnutrition and associated with infectious disease other than HIV. This is especially high in the first 6 months of life and decreases thereafter. The risk and feasibility of replacement feeding are affected by the local environment and the individual woman's situation.

Breastfeeding is associated with a significant additional risk of HIV transmission from mother to child as compared to non-breastfeeding. This risk depends on clinical factors and may vary according to pattern and duration of breastfeeding. In untreated women who continue breastfeeding after the first year, the absolute risk of transmission through breastfeeding is 10 to 20%.

The risk of MTCT of HIV through breastfeeding appears to be greatest during the first months of infant life but persists as long as breastfeeding continues. Half of the breastfeeding-related infections may occur after 6 months with continued breastfeeding into the 2nd year of life.

Evidence from one study indicates that exclusive breastfeeding in the first 3 months of life may carry a lower risk of HIV transmission than mixed feeding.

Recommendations

• When replacement feeding is acceptable, feasible, affordable, sustainable and safe, avoidance of all breastfeeding by HIV-infected mothers is recommended.

• Otherwise, exclusive breastfeeding is recommended during the first months of life.

• To minimize HIV transmission risk, breastfeeding should be discontinued as soon as feasible, taking into account local circumstances, the individual woman’s situation and the risks of replacement feeding (including infections other than HIV and malnutrition).

• When HIV-infected mothers choose not to breastfeed from birth or stop breastfeeding later, they should be provided with specific guidance and support for at least the first 2 years of the child's life to
ensure adequate replacement feeding. Programmes should strive to improve conditions that will make replacement feeding safer for HIV-infected mothers and families.

Cessation of breastfeeding

There are concerns about the possible increased risk of HIV transmission with mixed feeding during the transition period between exclusive breastfeeding and complete cessation of breastfeeding. Indirect evidence on the risk of HIV transmission through mixed feeding suggests that keeping the period of transition as short as possible may reduce the risk.

Shortening this transition period, however, may have negative nutritional consequences for the infant, psychological consequences for the infant and the mother, and expose the mother to the risk of breast pathology, which may increase the risk of HIV transmission if cessation of breastfeeding is not abrupt.

The best duration for this transition is not known and may vary according to the environment or the age of the infant or both.

Recommendation: HIV-infected mothers who breastfeed should be provided with specific guidance and support when they cease breastfeeding to avoid harmful nutritional and psychological consequences and to maintain breast health.

Infant feeding counselling

Infant feeding counselling has been shown to be more effective than simple advice for promoting exclusive breastfeeding in a general setting. Good counselling may also assist HIV-infected women to select and adhere to safer infant feeding options, such as exclusive breastfeeding or complete avoidance of breastfeeding, which may be uncommon in their environment. Effective counselling may reduce some of the breast-health problems that may increase the risk of transmission.

Many women find that receiving information on a range of infant feeding options is not sufficient to enable them to choose and they seek specific guidance. Skilled counselling can provide this guidance to help HIV-infected women choose what is appropriate for their situation, to which they are more likely to adhere. The options discussed during counselling need to be selected according to local feasibility and acceptability.

The level of understanding of infant feeding in the context of MTCT in the general population is limited, thus complicating efforts to counsel women effectively. The number of people trained in infant feeding counselling is few relative to the need and expected demand for this information and support.

Recommendations

* All HIV-infected mothers should receive counselling, which includes provision of general information about the risks and benefits of various infant feeding options and specific guidance in selecting the option most likely to be suitable for their situation. Whatever a mother decides, she should be supported in her choice.

* Assessments should be conducted locally to identify the range of feeding options that are acceptable, feasible, affordable, sustainable and safe in a particular context.

* Information and education on mother-to-child transmission of HIV should be urgently directed to the general public, affected communities and families.

* Adequate numbers of people who can counsel HIV-infected women on infant feeding should be trained, deployed, supervised and supported. Such support should include updated training as new information and recommendations emerge.
Breast health
Evidence indicates that breast conditions including mastitis, breast abscess and nipple fissure may increase the risk of HIV transmission through breastfeeding, but the extent of this association is not well quantified.

Recommendation: HIV-infected women who breastfeed should be assisted to ensure that they use a good breastfeeding technique to prevent these conditions, which should be treated promptly if they occur.

Maternal health
In one trial, the risk of dying in the first 2 years after delivery was greater among HIV-infected women who were randomized to breastfeeding than among those who were randomized to formula feeding. This result has yet to be confirmed by other research.

Women who do not breastfeed or stop breastfeeding early are at greater risk of becoming pregnant.

Recommendation: HIV-infected women should have access to information, follow-up clinical care and support, including family planning services and nutritional support. Family planning services are particularly important for HIV-infected women who are not breastfeeding.

Notes
2. Replacement feeding is defined as the process of feeding a child who is not receiving any breast milk with a diet that provides all the nutrients the child needs.
3. Exclusive breastfeeding is defined as giving an infant no other food or drink, not even water, apart from breast milk (including expressed breast milk), with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines.