Training Course on Child Growth Assessment

WHO Child Growth Standards

Answer Sheets
Answers for Module B:

Measuring a Child’s Growth
Answers to Exercise A

1. Salaam’s age today: 1 yr 9 mo

   The growth charts to be used for Salaam are:
   
   Length-for-age, Boys, 6 months to 2 years, on page 33
   Weight-for-age, Boys, 6 months to 2 years, on page 34
   Weight-for-length, Boys, Birth to 2 years, on page 35
   BMI-for-age, Boys, 6 months to 2 years, on page 36

2. Ruby’s date of birth: 1/5/2005

   Ruby’s age today: 11 mo

   The growth charts to be used for Ruby are:
   
   Length-for-age, Girls, 6 months to 2 years, on page 33
   Weight-for-age, Girls, 6 months to 2 years, on page 34
   Weight-for-length, Girls, Birth to 2 years, on page 35
   BMI-for-age, Girls, 6 months to 2 years, on page 36

3. Ivan’s age today: 12 wk

   The growth charts to be used for Ivan are:
   
   Length-for-age, Boys, Birth to 6 months, on page 29
   Weight-for-age, Boys, Birth to 6 months, on page 30
   Weight-for-length, Boys, Birth to 6 months, on page 31
   BMI-for-age, Boys, Birth to 6 months, on page 32
Answers to Exercise B

Nalah

1. Nalah’s Personal Data page should look something like the following:

```
  Personal Data

  Child's name  Nalah Parab
  Identification/Record number
  Parents' names  Hamid and Shira Parab
  Address  40 Rim Road

  Birth information:
  Date of birth  7-2-2006
  Gestational age at birth  38 wk
  Single/multiple birth?  Single
  Measurements at birth:
    Weight  2.9 kg
    Length  49 cm
    Head circumference
  Birth rank  1st
  Date of birth of next younger sibling (born to mother)

  Feeding:
  Age at introduction of any foods or fluids  3wk (water)
  More details of feeding history may be recorded in Visit Notes
  Age at termination of breastfeeding

  Adverse events (dates):
  (such as death of parent, death of sibling age <5 years)

```

2. Nalah’s Visit Notes (first row) should appear as follows:

```
  Date of visit  25-3-2006
  Age today  6 wk
  Measurements
    Weight (kg)
    Length/Height (cm)
    BMI*

  Reason for visit, observations, recommendations
    immunization
```
3. The health care provider should use the following growth charts for Nalah at this visit:

- Length-for-age, Girls, Birth to 6 months, page 29
- Weight-for-age, Girls, Birth to 6 months, page 30
- Weight-for-length, Girls, Birth to 6 months, page 31
- BMI-for-age, Girls, Birth to 6 years, page 32

**Toman**

1. Toman’s Personal Data page should look something like the following:

![Personal Data](image_url)
2. Toman’s Visit Notes (first row) should appear as follows:

![Visit Notes Table]

3. The health care provider should use the following growth charts for Toman at this visit:

- Length-for-age, Boys, 6 months to 2 years, page 33
- Weight-for-age, Boys, 6 months to 2 years, page 34
- Weight-for-length, Boys, Birth to 2 years, page 35
- BMI-for-age, Boys, 6 months to 2 years, page 36
B: Measuring a Child's Growth

Answers to Exercise C

Nalah

Nalah’s Visit Notes page should appear as follows if you used the BMI table to determine BMI. If you used a calculator, compare your results to the BMIs listed below the Visit Notes.

![Visit Notes Table]

*Note: It is equally acceptable to write 13 weeks (instead of 3 months) for Nalah’s third visit.*

Calculated BMIs:

- 13.3
- 14.0
- 14.3
- 15.2
- 16.0 (rounded from 15.99...)
Toman

Toman’s Visit Notes page should appear as follows if you used the BMI table to determine BMI. If you used a calculator, compare your results to the BMIs listed below the Visit Notes.

<table>
<thead>
<tr>
<th>Date</th>
<th>Age today (yrs/mo)</th>
<th>Measurements</th>
<th>Reason for visit, observations, recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 - 8 - 2006</td>
<td>1yr 1mo</td>
<td>11.9, 79.0, 19</td>
<td>well-child visit; measles immunization needed</td>
</tr>
<tr>
<td>15 - 12 - 2006</td>
<td>1yr 5mo</td>
<td>13.5, 84.5, 19</td>
<td>well-child visit</td>
</tr>
<tr>
<td>16 - 3 - 2007</td>
<td>1yr 8mo</td>
<td>15.0, 87.0, 20</td>
<td>ear pain</td>
</tr>
<tr>
<td>12 - 7 - 2007</td>
<td>2yr 0mo</td>
<td>16.8, 90.9, 20</td>
<td>well-child visit</td>
</tr>
</tbody>
</table>

* BMI (body mass index) = weight in kilograms divided by height in meters squared (kg/m²)

Other information (e.g. drug or food allergies, chronic conditions):

Calculated BMIs: 19.1
18.9
19.8
20.3
Answers for Module C:

Interpreting Growth Indicators
C: Interpreting Growth Indicators

Answers to Exercise A, Nalah

Length-for-age GIRLS
Birth to 6 months (z-scores)

Weight-for-age GIRLS
Birth to 6 months (z-scores)
Since Nalah’s length did not change between her visits at 10 weeks and 3 months, and her weight increased by only 0.1 kg, the points at these visits are plotted very closely on the same vertical line.

Nalah’s calculated BMIs are shown on this graph. A graph showing BMIs obtained from the BMI table will look slightly different.
Answers to Exercise A, Toman

Length-for-age BOYS
6 months to 2 years (z-scores)

Weight-for-age BOYS
6 months to 2 years (z-scores)
C: Interpreting Growth Indicators
Answers to Exercise A, continued

Weight-for-length BOYS
Birth to 2 years (z-scores)

BMI-for-age BOYS
6 months to 2 years (z-scores)

Toman’s calculated BMIs are shown on this graph. A graph showing BMIs obtained from the BMI table will look slightly different.
C: Interpreting Growth Indicators

Answers to Exercise B

Case 1 – Malek

1. Malek’s length-for-age is on or just below the median.
2. Malek’s weight-for-age is on the median.
3. Malek’s weight-for-length is on the median.
4. Malek’s BMI-for-age is just above the median.
5. Malek does not seem to have any growth problem or risk of a growth problem.

Case 2 – Nora

1. Nora’s height-for-age is on the median, so it is average for girls her age.
2. Nora’s weight-for-age is between the 1 and 2 z-score lines, so she is heavier than average for her age.
3. Nora’s weight-for-height is above the 2 z-score line (above 2).
4. Nora’s BMI-for-age is also above 2.
5. Nora is overweight.

Case 3 – Delphie

1. Delphie’s length-for-age is below −2.
2. Delphie’s weight-for-age is just below the −3 z-score line.
3. Delphie’s weight-for-length is on the −2 z-score line.
4. Delphie’s BMI-for-age is below −2.
5. The following growth problems should be ticked: stunted, severely underweight, wasted (based on BMI-for-age).
C: Interpreting Growth Indicators

Answers to Exercise C

Nalah

1. a) Nalah was an average length at birth but has experienced periods of slow growth and stagnation. Her length-for-age has thus dropped from the median at birth to below -3 z-score at 6 months.

   b) At 6 months, Nalah is severely stunted.

2. a) Nalah's weight at birth was just below the median but because of periods of very slow growth (e.g. birth to 6 weeks, 10 to 13 weeks), followed by inadequate catch-up growth (e.g. at 6 to 10 weeks and at 3 to 4 months), her weight-for-age has dropped systematically to below -2 z-score at 6 months.

   b) Nalah is underweight.

3. a) Nalah's weight-for-length has fluctuated between -1 z-score and the median since birth and at 6 months is tracking along the median.

   b) The weight-for-length chart shows the stagnation in length that occurred when Nalah was 55 cm long but currently it does not indicate a growth problem or risk of a problem.

4. a) Nalah's BMI-for-age has stayed close to the -1 z-score line and by 6 months is approaching the median.

   b) This chart does not indicate a current growth problem or risk of a problem.

5. Although Nalah was average length at birth, she became severely stunted by the age of 6 months. Her growth in both length and weight stagnated between age 10 weeks and 13 weeks, perhaps because of the episode of diarrhoea for which she was seen at the end of this period. Her weight has stayed appropriate for her length, so problems are not apparent on the weight-for-length and BMI-for-age chart. However, she is severely stunted and underweight according to the length-for-age and weight-for-age charts.
C: Interpreting Growth Indicators
Answers to Exercise C, continued

Toman

1. a) His length-for-age has been consistent, staying very close to the 1 z-score line.

   b) No problem or risk of a problem is evident on the length-for-age chart.

2. a) Toman’s weight is increasing too rapidly in relation to his age. His weight-for-age line has crossed the 2 z-score line and continued rising.

   b) The weight-for-age chart shows that Toman is very heavy for his age, but a judgment of whether he has a problem with overweight should be based on his weight-for-height or BMI-for-age.

3. a) Toman’s weight is increasing too rapidly in relation to his length. His weight-for-length has crossed the 2 z-score line and reached the 3 line.

   b) The weight-for-length chart shows that Toman is overweight and is at risk of becoming obese.

4. a) (Note: The shape of the BMI-for-age curve will differ slightly when using calculated values versus values from the table). Toman’s BMI has increased from above 1 z-score to reach the 3 z-score line (or just below if BMI values from the table are used).

   b) Toman is not only overweight but on the threshold of obesity (on or just below 3 z-score).

5. Toman has grown normally in length, tracking along line 1 z-score. But his weight has increased too rapidly for his length and his age, as shown on three of the growth charts (weight-for-age, weight-for-length, and BMI-for-age), where his growth lines are near or on the 3 z-score line. His is overweight and has a definite trend towards obesity.
Answers for Module D:

Counselling on Growth and Feeding
D: Counselling on Growth and Feeding

### Possible Answers to Exercise C

1. Since Nalah is 6 months old, the health care provider should use list of recommended foods on page 15 of the *Growth Record* and the feeding recommendations on pages 16–17.

2. **Causes of Nalah’s undernutrition**

<table>
<thead>
<tr>
<th>Cause</th>
<th>Possible advice to be given</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nalah has not been fed frequently enough. Because Nalah’s mother works, she has not been able to breastfeed enough.</td>
<td>Nalah needs more frequent feedings. Breastfeed as often as possible. Give other milk when you cannot breastfeed. (Advice on expressing breast milk may be given if mother is willing and it is possible to store the milk safely.) Give Nalah a soft staple food such as thick porridge mixed with a bit of oil. Give the porridge 2–3 times a day, 2–3 tablespoons each time. Increase the amount gradually up to 1/2 cup of mashed food 3 times a day. Give 1–2 snacks between meals depending on her appetite. Introduce new foods one at a time. Give Nalah staple foods and a variety of animal-source and other nutritious foods listed on page 15 of the <em>Growth Record</em>.</td>
</tr>
<tr>
<td>Nalah is sickly (runny nose, tired), which may be partly due to hygiene problems in the home.</td>
<td>Continue boiling drinking water. Wash utensils used for feeding Nalah in boiled water. Be sure to heat cooked food thoroughly. Wash hands after going to the group latrine, before preparing food, and before feeding Nalah.</td>
</tr>
</tbody>
</table>

See as an example, on the next page, the entry that the health worker wrote in Nalah’s *Growth Record*. 
Example of Visit Notes for Nalah

<table>
<thead>
<tr>
<th>Feeding: Notes on history, any problems, counselling given</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nalah is underweight and short for her age. Advised to increase breastfeeding; give thick porridge (2–3 tablespoons 2–3 times a day); introduce new foods one at a time such as those on page 15. Return 15 September 2006.</td>
</tr>
</tbody>
</table>
### Possible Answers to Exercise E

1. The recommendations on page 19 of the *Growth Record* are applicable for Toman.

2. **Causes of Toman’s overweight**

   **Possible advice to be given**

   - *Too many high energy food choices such as:*
     - Milk with added sugar or chocolate
     - Soft drinks
     - Sweets like cookies and cake
     - Sweet chocolate and nut spreads
     - Stop adding sugar and chocolate to milk.
     - Limit soft drinks (no more than twice per week)
     - Limit sweets (no more than twice per week)
     - Use high-calorie spreads sparingly

   - *Bottle of milk used to get Toman to sleep*
     - Give only 500 ml of milk per day. Try rocking or singing Toman to sleep. If he is thirsty, give him water or milk in a cup, not a bottle.

   - *Lack of control over feeding at father’s and grandmother’s home*
     - Talk to the father and grandmother about Toman’s overweight. Show them his *Growth Record*. Tell them the advice given by the health care provider.

   - *Lack of physical activity and too much television*
     - Make sure that Toman has some physical activity each day. Ask the babysitter and Toman’s father to take him outside to play.
     - Sit together at a table for meals instead of watching television.

See as an example, on the next page, the entry that the health worker wrote in Toman’s *Growth Record.*
### Example of Visit Notes for Toman

#### Feeding: Notes on history, any problems, counselling given

*Toman is overweight. Advised to stop adding sugar and chocolate to milk; give only 500 ml milk each day (in cup); increase physical activity (play outdoors). Return 12 October 2007.*