



## CASE STUDY 1

Clara (22) who studies architecture at college, comes to her gynecologist for a check-up, complaining that she hasn't had her period in several months.

1. What do we call a condition when a woman does not have a period in medical terminology? Name at least this condition that could lead to such a condition.

Clara has never had a regular period, and it was accompanied by severe pain, so she was not so concerned about not having a period for several months. On the other hand, she complains about a lack of appetite, tiredness, and nausea. She thought these difficulties arose due to stress from school, but when she did not get better after the semester ended, she decided to seek her GP. He took her blood and, based on the results, recommended she see a gynecologist. Apart from her current state, she does not have any other underlying medical conditions, she has been involved in athletics and has a BMI of 20. Her extended family comes from Germany, and none of them are being treated for any disease.

In the following table, you will find Clara's blood sampling results:

sodium		130 mmol/l
potassium		3.7 mmol/l
chloride		97 mmol/l
urea		4 mmol/l
cholesterol		5,5 mmol/l
High density lipoprotein (HDL)		3,5 mmol/l
Low density lipoprotein (LDL)		2 mmol/l
albumin		30 mg/l
Aspartate Transferase (AST)		0,3 $\mu$ kat/l

total protein		58 mg/l
glucose		3 mmol/l
Alanine transaminase (ALT)		0,3 $\mu$ kat/l
Triacylglycerol (TAG)		3 mmol/l
Erythrocytes		$3,3 \times 10^{12}/l$

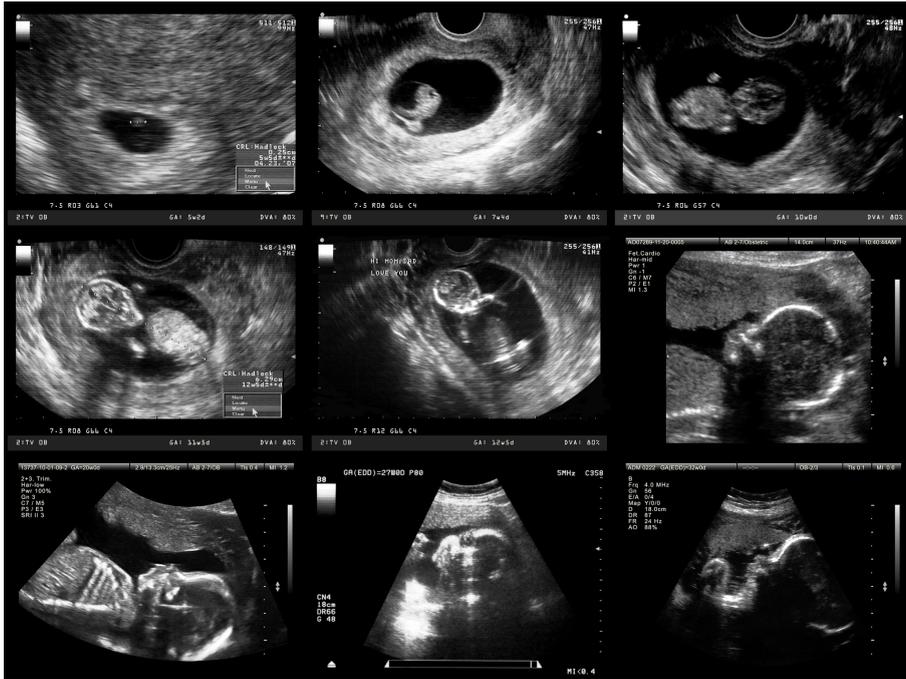
2. In the empty column of the table, write the normal ranges in SI units and color the rows with abnormal values. (7 pt for correct entry of values, 3 pt for marking abnormal values)

The gynecologist will also be interested in her hCG value - 15000 mIU/ml.

3. What is hCG? Besides pregnancy, what could be the other three causes of elevated hCG? (2 pt)

Ultrasound confirms that Clara is pregnant. Since she is pregnant for the first time, the doctor informs Clara about the course of the pregnancy and the next steps. Based on the sonography image, the doctor determines the age of the fetus.

4. Why do gynecologists use the gestational, not the embryological/fetal age, to calculate the length of pregnancy? What is the difference between them? (1 pt)
5. The hCG value indicates that Clara is in the first trimester. What fetal biometric parameters are used to analyze the sonography image and determine fetal age? (3 pt)



The gynecologists measure the following values

BPD (biparietal diameter): 48 mm

Femur length: 34 mm

Head circumference: 170 mm

Abdominal circumference: 151 mm

6. What is the gestational age of the fetus based on the measurements of the ultrasound scan? (2 week tolerance) (1 pt)
7. If Clara had come to the doctor 3 weeks earlier, would her hCG levels have been higher or lower? How does the production of hCG develop during pregnancy and where in the body is it produced? (3 pt)
8. Pregnant women are often prescribed vitamin B9 as a dietary supplement. Is it reasonable to prescribe B9 to Clara? At what stage of fetal development is the abundance of folic acid the most important, and how would a lack of this vitamin impact fetal development? (1 pt)
9. Which value from Clara's blood test would indicate a lack of B9? (1 pt)
10. Pregnant women are often examined for gestational diabetes. Why does it develop during pregnancy? Does Clara belong to the risk group for its development? (2 pt)
11. What three other examinations should Clara's doctor perform to confirm that the fetus is healthy and that there will most likely be no birth complications? (3 pt)

## **CASE STUDY 2**

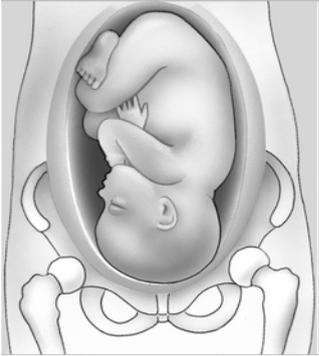
### **Child delivery**

After pregnancy without any major complications, Clara arrives at the hospital in the 39th week of pregnancy. She has been having contractions for a few hours, and the pain has been worsening.

The doctor looks at her health card and finds out that Clara was tested positive for Group B Streptococcus during 35. week of pregnancy.

1. Where in the body is Group B Streptococcus found? How will this information impact the doctor's procedure? What could be the consequences for the child if the doctor neglects this information? (2 pt)
2. You need to know the stage of Clara's labor to determine the next steps. What are the individual stages of labor and delivery? What happens during these stages? (3 pt)
3. The doctor finds out that Clara is currently dilated to 6 centimeters. What is the ideal dilation? Could she start operating in this condition? (1 pt)
4. Doctor connects Clara to CTG. What can be seen in CTG? What are normal CTG values? (1 pt)
5. The doctor determines the fetal position using ultrasound and touch. Which of the following positions allow for normal birth through the birth canal without major complications? Which position/positions allow for vaginal delivery, but it will be more complicated for the doctor? For which of the positions would you recommend cesarean section delivery?

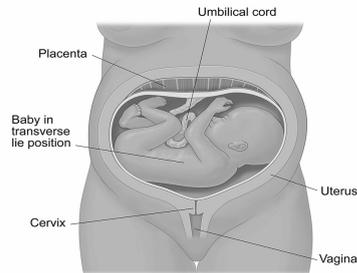
### 1. Head down position



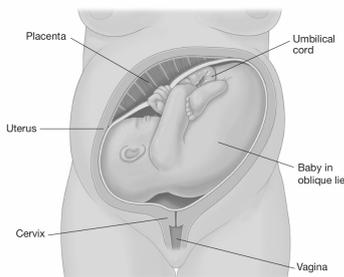
### 2. Breech position



### 3. Transverse position



### 4. Lying sideways



(2 pt)

Clara's baby is in the head-down position. Clara dilates very slowly and the contractions are accompanied by intense cramps with tightening.

6. Oxytocin is sometimes given to speed up labor. What is oxytocin and how does it help with childbirth? (1 pt)

Klara's baby is gradually moving out of the birth canal, but it is quite big in size, specifically in the 90th percentile. The doctor decides to perform an episiotomy to prevent her perineum from tearing.

7. What are the degrees of perineal tears? What do they mean? What is an episiotomy? (3 pt)
8. Despite the episiotomy, the doctor is unable to guide the baby's head through the birth canal. What two tools would help the doctor? Describe how they work. (1 pt)
9. Clara gives birth to a beautiful boy called Adam. Next, a pediatrician examines Adam. He is pink, his heart rate is 90 bpm, he screams, but he does not move much and reacts poorly to stretching out his hand. What APGAR score would the doctor give to Adam? Should a neonatologist be concerned about the result? Where and how many times is Adam examined? When and how many times is the child evaluated? (2 pt)
10. After cutting the umbilical cord, it goes through a morphological assessment. Name at least two diagnostic markers that can be checked in the umbilical cord sample. (1 pt)
11. After the delivery of the placenta, the doctor notices that part of the placenta stayed inside the uterus. Can this lead to any complications and if yes, why? (1 pt)
12. A large number of physiological changes take place in Adam's body after birth. One of them is a switch from the production of fetal hemoglobin to the production of adult hemoglobin. Why does Adam have different hemoglobin before birth? (1 pt)
13. How does low hemoglobin affect the newborn? What is the treatment for these conditions? (1 pt)

### CASE STUDY 3

Lauren and Micheal have been married for 3 years. Lauren is 32 years old, with a blood group of A- and a family history of hypertension. Micheal is 34 years old, with blood group of AB+ and a family history of diabetes. Lauren is 5 weeks pregnant. Following her prenatal appointment, her hematologic and biochemistry parameters are as follows:

Hb 140 g/L	24 hr protein 0.3 g
WCC 14 x 10 <sup>9</sup> /L	Creatinine clearance 170 mL/min
Platelets 300 x 10 <sup>9</sup> /L	Bilirubin 13 µmol/L
MCV 100 fl	Total protein 50 g/L
CRP 6 g/L	Albumin 35 g/L
Sodium 141 mmol/L	AST 30 iu/L
Potassium 4 mmol/L	ALT 32 iu/L
Urea 3.9 mmol/L	GGT 43 iu/L
Creatinine <69 µmol/L	Alkaline phosphatase 400 iu/L
Urates 375 µmol/L	Bile acids 12 µmol/L

1. Based on her chart and lab results, her gynecologist diagnosed her with which condition? (1 pt)
2. What are the diagnosis tests done to confirm the condition. (1 pt)
3. Explain the signs & symptoms. (2 pt)
4. Does this condition affect the mother or the fetus? (1 pt)
5. With this condition, how does a second pregnancy differ from the first? (1 pt)
6. What are the treatment options? Explain the mechanism of action. (mention route of administration for the same, number of doses and dosage schedules as well) (3 pt)
7. What is the prognosis for the same? (1 pt)