

Format toets met open vragen, casusvragen, essayvragen

1. Aan de ontwikkelaar van de toets, lees door voordat je begint:
2. Vul alleen de grijze delen in, verwijder daarbij de #. De rest van de tekst ligt vast.
3. Bepaal hoe groot de invulvakken moeten zijn qua uiterlijk. Geef indien van toepassing zowel in de vraag als in het invulvak aan of er een woordenlimiet op het antwoord zit (bijv. max 750 woorden). Bij geen vermelding is het aantal woorden ongelimiteerd.
4. Wijzig niets aan opmaak, lettertype en –grootte (Arial 11, kopjes vetgedrukt)
5. Stuur je toets voor feedback naar A) een vakinhoudelijke collega en B) [toetsing-ioo@vumc.nl](mailto:toetsing-<u>ioo@vumc.nl</u>) voor een toetsdeskundige controle.
6. Stuur je definitieve versie, vrij van vakinhoudelijke fouten en taal- en spelfouten, op naar toetsbeheer@vumc.nl

Minortrack Child Healthcare

CAT Current research in pediatrics date 28 October 2016

This examination contains 9 open questions. Each question contains information about how many points can be earned. The maximum number of points to earn for the test is 70. The results of this test determine 50% of the final grade for this course. The other 50% is determined by the results from the writing assignment.

Only write down answers in logical sentences, no loose information with lack of structure. Your grade is not influenced by the number of words you use in your answers, unless this is specified otherwise at the question.

It is not permitted to give more answers than specified in the question (e.g. three criteria, four aspects). So don't write down six answers in hoping three of them are correct.

This examination takes two hours (+ 30 minutes for the students with extra time).

Practical matters

- Mobile phones have to be switched off and be put in your bag under your chair.
- Only necessities for this examination are allowed on the table.
- Questions about the content of the examination will not be answered.
- You can send your comments to the course representation (CVW) afterwards.
- Visiting the toilet is not permitted.
- Fraud will be punished.
- You are obliged to follow the instructions of the invigilator at all times.
- In the event of a technical malfunction, raise your hand so that your name can be written down by the invigilator. If your name is not written down, you have no right to complain afterwards.
- If you have not signed up for this examination, you will not receive a result.
 - You can object to the fact that you can no longer sign up for the examination after the subscription deadline.
 - Send in your appeal within one week after the examination. More information you will find on www.vu.nl/intekenen.

Good luck!

Question 1a (3 points;1 point per criterium)

Mention three important functions of the neonatal intestinal microbiome

Question 1b (2 points)

Explain what intestinal microbial dysbiosis means.

Question 1c (2 points)

How can intestinal microbial dysbiosis hypothetically provoke sepsis?

Question 1d (3 points;1 point per criterium)

Several pediatric diseases are associated with microbial dysbiosis.
Name three factors of significant influence on the neonatal microbiome.

Question 1e (4 points; 2 points per characteristic)

Over the past decade, an increasing number of studies demonstrated that microbiota has an important role in the etiology of pediatric inflammatory bowel disease (IBD). In addition, recent studies demonstrated an alteration in microbiota prior to an exacerbation of IBD, making microbiota analysis an interesting candidate as biomarker for predicting IBD exacerbations. You want to develop a device which allows for microbiota analysis which can be used in the outpatient clinic.

Mention two important characteristics the aforementioned device should possess, before it can be implemented in clinical practice.

Question 1f (2 points; 1 point per reason)

You want to develop a device allowing for microbiota analysis which can be used in the outpatient clinic in order to detect IBD exacerbations. You have the option to use blood or feces as analytical medium for your new device. Assume that both feces and blood samples provide exactly the same results.

Mention a pro- (1point) and a contra reason (1point) for using blood instead of feces.

Question 2a (3 points; 1 point per example)

One of the features of encephalitis is encephalopathy.

Give three examples of encephalopathy that have NO direct infectious origin.

Question 2b (2 points)

Which form of viral meningo-encephalitis is the most common in the Netherlands?

Question 2c (2 points; ½ point per item)

Name 4 characteristics of a normal clinical course of viral meningo-encephalitis (1/2 point per item, 2 points total).

Question 2d (2 points)

What is the long term prognosis for this disease?

Question 2e (2 points; 1 point per cause)

Name two other viral causes for meningo-encephalitis. (1 point per cause)

Question 2f (2 points; 1 point per cause)

Name two viral causes for congenital encephalopathy. (1 point per cause)

Case 1 (3 points)

Case vignette

A 15-year-old girl presents to the emergency department (ED) with confusion and a seizure. Her parents note that she has been more forgetful and irritable for the past 10 days. Her behavior has also become bizarre, and at one point she thought the television was talking to her. The pediatrician ordered basic blood work and a urine toxicology, which were normal. On the morning of presentation, she had a generalized tonic-clonic seizure while eating breakfast. On arrival to the ED, she is alert and oriented to place and person but not time. She has poor short-term memory and decreased attention span. She exhibits a postural tremor in her upper extremity.

Question 3a (1 point)

What is the most probable diagnosis in this girl?

Case vignette

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Question 3b (2 points)

Cerebrospinal fluid demonstrates 12 cells/2L with normal protein and glucose levels. Intravenous acyclovir and phenytoin are started. MRI of the brain and EEG are normal. After 3 days, her clinical status does not improve and the CSF PCR testing is negative for herpes simplex virus, varicella-zoster virus, cytomegalovirus, Epstein-Barr virus, and human herpesvirus 6.

Which autoantibodies are most likely to be responsible for her presentation? Name the type.

Question 4 (7 points; 1 point for each correct answer)

Below you find an abstract from Pubmed.

Neurology, 2005 Apr 26;64(8):1461-4.

Leukoencephalopathy with ataxia, hypodontia, and hypomyelination.

Wolf NI¹, Harting I, Boltshauser E, Wiegand G, Koch MJ, Schmitt-Mechelke T, Martin E, Zschocke J, Uhlenberg B, Hoffmann GF, Weber L, Ebinger F, Rating D.

Author information

Abstract

The authors describe four unrelated girls with a distinctive neurologic disorder with early-onset progressive ataxia and hypodontia with a characteristic pattern of delayed dentition. Cerebral MRI shows hypomyelinated white matter and cerebellar atrophy; 1H-MRS of white matter reveals a marked elevation of myo-inositol.

The authors of this article describe 4H syndrome.

Which of the following symptoms are typically found in hypomyelinating disease?

Please mark 'yes' or 'no' for each symptom.

Symptom	Yes	No
Ataxia		
Nystagmus		
Spasticity		
Hypodontia		
Low visus		
Epilepsy		
Dystonia		

Question 5a (1 point).

What is the cause of Alexander disease?

Question 5b (4 points; 1 point per right answer).

Mutations in genes can lead to protein changes in different celltypes of the brain, which in turn lead to a whitematter disorder.

In which four cell-types are these protein changes seen?

Question 6 (4 points; 2 points per right answer).

Professor Van der Knaap collected 5 patients with similar MRI abnormalities consistent with a leukodystrophy with a pattern of white matter abnormalities that were never identified in the described diseases. All these patients have consanguine parents and Van der Knaap expects an autosomal recessive genetic disorder. In order to find the genetic mutations responsible for the condition she considers whole exome sequencing (WES).

There is the possibility of secondary or incidental findings. Describe how incidental findings can have consequences for patients and their relatives and therefore should be addressed during counseling.

Case 2

A five-year old girl is presented to the pediatric oncology department with a history of fever for two weeks, pallor and bruises. On physical examination you see an apathetic girl, with some bruises, petechiae and hepatosplenomegaly; otherwise normal. Her blood sample provides the following results: hemoglobin 4.6 mmol/L (norm values: 8.5-11.0 mmol/L), thrombocytes: $18 \times 10^9/L$ (norm values: $150-400 \times 10^9/L$), leucocytes: 200×10^9 ($4-10 \times 10^9/L$), differentiation of peripheral white blood cells: 81% lymphoblasts. You work as a resident of the department and you suspect an acute childhood leukemia.

Question 7a (3 points; 1 point per right answer)

You are meeting this patient at the emergency ward of your hospital and inform her and the parents about your suspicion and the diagnostic tests that should take place now.

Which 3 diagnostic tests on blood and/or bone marrow do you explain to the patients and the parents that should be performed to differentiate between acute lymphoblastic leukemia and an acute myeloid leukemia in this patient?

Question 7b (2 points)

Since the early 1960's the focus of pediatric acute lymphoblastic leukemia research has been to improve survival. Over the last decade there has been a shift in the research focus of acute lymphoblastic leukemia.

What is nowadays the focuspoint of acute lymphoblastic leukemia research instead of survival (1 point) and what was the reason of this shift in focus (1 point)?

Question 7c (2 points)

The overall survival and event free survival of children with acute lymphoblastic leukemia is superior to that of pediatric acute myeloid leukemia.

Name 2 reasons for these differences.

Case 3

A fifteen year old post-puberal girl underwent biopsy for a swollen lymph node in her neck. Diagnosis: a stage II Hodgkin lymphoma. The girl and her parents have come to the hospital to discuss the test results. After the initial news some questions arise.

The girl and her parents had anticipated this diagnosis and did some online research concerning the disease and its treatment. During this search they questions raised about possible late effects of childhood cancer and its treatment.

One of the potential late effects of childhood cancer and its treatment, that may significantly impair quality of life, is infertility. When at risk for this particular side-effect of treatment, several fertility preservation techniques can be offered to a female cancer patient before treatment starts.

Question 8a (2 points; 1 point per right answer)

Name 2 types of fertility sparing techniques that can be offered to this particular girl before treatment starts.

Question 8b (2 points; 1 point per right answer)

Name 2 ethical dilemmas which we face when we try to preserve female fertility before the start of treatment

Question 8c (4 points; 1 point per right answer)

Name four other common late effects than infertility that survivors may develop as a consequence of their pediatric oncology treatment.

Question 9

Your department performs a trial concerning a new test for diagnosing meningitis in children. The trial is titled 'meningitis trial'. The participants will be asked to give two extra blood samples. A 4 year old girl is admitted to your department and she would be a good candidate for the trial. You decide to ask the parents for informed consent. The parents are married and thereby they have both the guardianship over this child.

Question 9a (3 points; 1 point per item)

Name 3 mandatory components of a patient information form according to the CCMO (Central Committee on Research Involving Human Subjects).

