2018 - IID - MD4043 - Eksamen 3. Eksamensdato: 2018-12-17

A 34-year old woman attends your GP surgery. She has had problems with obesity all her life. As part of her programme to lose weight she has started to exercise. But exercising is limited because she leaks urine and her underwear gets wet.

She has just been to see a private gynaecologist who has not found anything wrong at examination, and who strongly recommends that she loses weight before any further investigations for the urine leakage. The patient feels she is in a vicious circle. What is the most correct treatment to prescribe?

## A Local oestrogens

- Presumably her oestrogen levels are not so low that Vagifem alone would be beneficial **B X** Incontinence pads on a reimbursed prescription
- This is the correct answer and will benefit her financially. And perhaps her incontinence will diminish when she has lost weight.
- C Anticholinergics on a reimbursed prescription
   Is used for symptomatic treatment of urge incontinence and/or frequent urination and an
   increased urge to urinate which can occur in patients with an overactive bladder; here it is more
   likley to be stress incontinence as it happens wth physical activity.

   D Antidiuretic hormone prior to exercise
- This is used for enuresis and not during the day

## 2

A woman is a pregnant for the first time; she is in week 32, healthy and so far has had an uncomplicated pregnancy. She wants to be delivered by Caesarian section. You are her GP. What do you preferably say to her?

- A That Caesarian sections are only performed if there is a medical indication
- **B** That she can go to a private hospital where the baby will be delivered as she wishes **C X** That the risks are lowest with an uncomplicated vaginal delivery for both the mother and
- **C X** That the risks are lowest with an uncomplicated vaginal delivery for both the mother and child, and you motivate her to have this *This is the recommendation from the experts in obstetrics*
- **D** That she can decide herself how she will give birth

# 3

A 32-year old woman attends her GP for her first pregnancy check-up. Which blood samples are to be taken at this consultation according to the national clinical guideline for antenatal care?

A Blood group antibody, HIV, Hepatitis B and C, Hb, CRP and leukocytes

- **B X** Blood group and blood group antibody, Hb, rubella, HIV, syphilis, as well as hepatitis B and C if indicated
- In accordance with the national clinical guideline for antenatal care.
- C Blood group antibody, Hb, HIV, and hepatitis B and C
- D Blood group and blood group antibody, Hb, CRP and leukocytes

# 4

What characterises a frank breech?

- A The fetus has flexed hips and knees *Complete breech*
- B The fetus has extended hips and flexed knees
- Kneeling breech very rare, almost impossible
- C The fetus has extended hips and knees Footling breech (the fetus stands in the vaginal canal)
- D X The fetus has flexed hips and extended knees
   A frank breech is also known as an extended breech

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A 32-year old woman attends her first pregnancy check-up with her GP. Which clinical examinations must be done at this consultation according to the National Guideline for Antenatal Care?

- **AX** Height, weight, blood pressure, urine test and gynaecological examination, if indicated *According to the National Guideline for Antenatal Care*
- B Height, weight and gynaecological examination, if indicated
- C Body Mass Index, blood pressure and chlamydia test
- D Body Mass Index, urine test and gynaecological examination, if indicated

## 6

Below, you can see a photo of a pair of newborn twins. What is wrong with these twins?



**A X** One of the twins has anaemia, the other has polycythemia

Twin anemia polycythemia sequence, TAPS is the correct answer. Communication in the placenta has resulted in anaemia in the one twin and polycythemia in the other. This is not the same as twin transfusion syndrome in which there is a fluid imbalance between the twins.

- B One of the twins has severe birth asphyxia, the other has normal pH
- One of them is pale which could be from asphyxia, while the other has an abnormal red colour. C One is healthy, the other is dead
- The pale twin is also holding its arms in a normal position which demonstrates that there is tonus.
   D One of the twins has severe jaundice, the other twin has normal bilirubin Neither of them appear to be icteric

Shoulder dystocia is a feared obstetric complication. Which gorup of factors most increases the risk of shoulder dystocia?

- High BMI, large foetus and long labour Α
- BMI >40 in the mother and large foetus Mother is short with high BMI В
- С

D X Previous shoulder dystocia, diabetes in the mother and large foetus These are the most important factors

# 8

Below you can see an ultrasound image from a pregnant woman. What does this image show?



- Twin pregnancy where the twin on the left has acrania (head is absent) Α For one twin we can see both head and body because we are looking at a longitudinal section; for the other twin we see only one structure, but this is because this view is a cross-section. **B X** Dichorionic diamniotic (DCDA) twins
- Correct answer. The twins lie in two separate cavities and each have an amnion. The amnion can be clearly seen for both of them.
- С Monochórionic diamniotic (MCDA) twins MCDA twins will lie in the same cavity (gestation sac), but these in the image each have their own amnion
- Monozygotic twins D We cannot determine this; DCDA twin pregnancies can be either monozygotic or dizygotic.

What characterises an occiput posterior position of the head during a birth?

- Vaginal delivery is impossible if the fetus' back faces posteriorly (towards the mother's back) Α Vaginal delivery is possible with occiput posterior, and it is normal that the back faces posteriorly
- R If occiput posterior is present with full cervical dilation, it is highly unlikely that the head will turn to the occiput anterior during the second stage of labour Most occiput posterior will turn to occiput anterior when the head reaches the pelvic floor
- **C X** The birth often takes longer Correct
- This is a common condition that occurs in about 15% of all births D Occurs in about 7% of all births

## 10

What is the most correct relationship between a twin pregnancy and time of delivery in regard to due date?

- A Generally give birth around the due dateB X Generally give brith as late premature
- Most frequently occur as a late premature birth
- The birth is generally induced in weeks 37-38 С
- D Most often delivered by Caesarian in weeks 37-38

# 11

A 21-year old woman comes to your surgery. She is concerned because she has had amenorrhea for almost 2 years. She is an ambitious and hard-working student. In addition she exercises for at least 1 hour 5 times a week. Her BMI is 17 kg/m2 (normal weight: 18.5 - 24.9kg/m2). She does not use contraception.

What is the most probable pathogenetic mechanism/hormone disturbance underlying her amenorrhea?

AX Hypogonadotropic hypogonadism, i.e. low gonadotropins (FSH and LH), and slightly low oestradiol

Correct answer. Central (hypothalamic/pituitary) inhibition of ovulation as is seen in cases of underweight, stress or over-exercising

- Hypergonadotropic hypogonadism, i.e. high gonadotropins (FSH and LH), and low oestradiol Incorrect answer. It is highly unlikley that a 21-year old woman with the above-mentioned medical R history would have premature ovarian failure/premature menopause.
- С Both urine and serum hCG (human chorionic gonadotropin) are positive

Low probability that this woman is pregnant - she has most probably been anovulatory for 2 vears.

D Normogonadotropic hypogonadism, i.e. normal gonadotropins (FSH and LH), and slightly low oestradiol Is seen in polycystic ovarian syndrome (PCOS), but is not probable based on the medical history.

# 12

What is saline infusion sonography (SIS) used for in a gynaecological examination?

- To visualise endometriosis Α No.
- **BX** To visualise the uterine cavity Correct answer. It can visualise endometrial polyps and submucosal myomas. To test whether the Fallopian tubes are open С
- No, that test is called pertubation.
- D To avoid metastases if endometrial cancer is supsected No.

What is the treatment principle in ovarian cancer with metastases outside the ovaries?

A Anti-estrogen therapyB X Surgery + chemotherapy

- Surgery plus chemotherapy is the standard treatment
- **C** Primary radiotherapy
- D Surgery + radiotherapy

# 14

What is the most important reason for the decrease in the incidence of cervical cancer in Norway over the last 40-50 years?

- A HPV screening HPV screening is not yet in use as a national screening method in Norway, but will be introduced over the next 2-3 years.
- **B** HPV vaccination *HPV vaccination started in Norway in 2009; it is too early to see the effect on the incidence of cervical cancer.*
- **C X** Cervical cytology screening The national cytology screening program started in Norway in 1995, but cytology screening was common as early as the 70s, and it is the effect of this screening that is the reason for the decresase in the incidence of cervical cancer.
- **D** Increasing use of contraceptive pills The use of contraceptive pills is not related to the decrease in the incidence.

# 15

What are the most common histologic types of endometrial cancer?

**A X** Endometrioid adenocarcinoma.

- The most common histologic type, comprising about 80% of endometrial cancers.
   B Papillary serous adenocarcinoma. This is the most common histologic type for endometrial cancer type II which comprises 15% of
- endometrial cancers.
- C Clear cell carcinoma.
- **D** Carcinosarcoma.

# 16

What is the most common histologic type of vulvar cancer?

A Malignant melanoma

Malignant melanoma comprises about 10% of vulvar cancers.

- B Basal cell carcinoma
- Basal cell carcinomas, adenocarcinomas and sarcomas together comprise about 5% of vulvar cancers
- **C** Adenocarcinoma Basal cell carcinomas, adenocarcinomas and sarcomas together comprise about 5% of vulvar cancers
- **D X** Squamous cell carcinoma *Squamous cell carcinoma comprises at least 85% of vulvar cancers.*

A 24-year old woman who is pregnant for the first time comes to you in a general practice in town. She cohabits with her partner, and has a planned pregnancy, her last period was 5 weeks ago. Over the last two days she has had some slight vaginal bleeding, but no pain. She is very worried that there is something wrong with the pregnancy. Urinary HCG (human chorionic gonadotropin) test is positive. As a GP in the town, what should you do?

- A Refer the patient to a fetal medicine clinic for an early ultrasound examination (about week 12). *This would be an unacceptably long time to wait for this worried woman.*
- **B** Perform a gynaecological examination with chlamydia testing and cytology from the cervix. It is not wrong to do this, but you do not get any closer to a diagnosis on whether the pregnancy is vital or not; i.e. whether a spontaneous miscarriage is ongoing.
- C X Take quantitative HCG tests in serum with a 2-day interval. This is the correct action at this early stage of pregnancy. A doubling (or satisfactory increase in HCG) in these 2 days will indicate that the pregnancy is vital, and you can put the patient's mind at ease. At a later time point you can then refer the patient for ultrasound examination.
   D Refer her to a gynaecology specialist for ultrasound as an emergency examination.
- **D** Refer her to a gynaecology specialist for ultrasound as an emergency examination. *This is not correct; this is too early in the pregnancy to be able to give a definite diagnosis of the pregnancy*

# 18

A 19-year old girl attends your surgery. She is worried because she has had total amenorrhea for a year. She is an ambitious and hard-working student. In addition, she exercises for at least 1 hour, 5 times a week. Her BMI is 16 (normal weight: 18.5-24.9). She does not use contraception. The girl is worried that she will not be able to have children later. The gynaecologist measures her s-AMH (Anti-Mullerian Hormone).

What is the most probable result for this girl, and how would you interpret the result?

- A X s- AMH 20 pmol/L (normal) Interpretation: The girl has normal egg reserves and will have a good chance of becoming pregnant if her underlying condition is treated succesfully *Girls with amenorrhea due to anorexia have normal egg reserves; if their weight normalises they can regain their periods and can become pregnant.*B s-AMH 70 pmol/L (high) Interpretation: The girl's AMH is 2-3 times higher than normal, and she has good ovarian reserves with a reasonable chance of becoming pregnant later in life *AMH levels that are 2-3 times higher than normal are most often seen in polycystic ovarian syndrome (PCOS); this is not the most probable diagnosis in this case.*
- C s- AMH 10 pmol/L (normal) and positive pregnancy test Interpretation: The girl is already pregnant and there is therefore no need to worry about not being able to have children in the future Improbable based on the medical history
- D s-ÁMH <1.1 pmol/L (low) Interpretation: Low/not detectable AMH indicates emptied egg reserves, and the girl's chances of becoming pregnant are unfortunately very low Improbable based on the medical history.

The patient is 38 years old, pregnant with her 3rd child in week 36. Her two previous children weighed 3,900 g and 4,500 g.

A glucose tolerance test was performed in week 24, and revealed fasting blood glucose of 5.0 mmol/L (ref.: 4.2 - 6.3 mmol/L) and a 2-hour glucose load gave 8.3 mmol/L (ref.: < 7.8 mmol/L). She was then given detailed dietary and lifestyle advice. She has only put on 7 kg during the pregnancy, and all HbA1c levels have been below 6.0%.

Today's fundal height measurement gives the same value as 3 weeks ago.

What is the most correct course of action for you as her GP?

- A You arrange a new check-up of the fundal height measurement in 1 week by the midwife
- **B** You tell her it is normal that the child's head descents into the pelvic entrance with the 3rd child, and therefore the fundus is a little lower
- **C X** You refer her to the maternity outpatients clinic/foetometry Correct answer. The fact that the fundal height measurement has not increased can indicate placental failure and growth inhibition of the fetus. This must be followed up, particularly in a woman with gestational diabetes.
- **D** You tell her that this child will probably not be as large as the previous babies because of the good glucose regulation

# 20

Siri is pregnant for the first time in week 31. She is admitted to the Maternity Dept. with a blood pressure of 175/120, and urine proteins 4+. The urine appears concentrated. She has an intense headache and is restless. She asks what will happen next in the pregnancy. Which is the most correct information to give here?

- A Prompt treatment with i.v. fluid and diuretics to trigger urine production is essential to stabilise the situation Treatment with increased fluid intake gives a risk of pulmonary oedema and is contraindicated, as is the use of diuretics.
- **B** X She should receive an infusion of magnesium to prevent convulsions, antihypertension treatment to stabilise her BP, and a Caesarian section a few hours after admission In severe preeclampsia where the patient shows symptoms of threatening eclampsia, Caesarian section is the only option to reverse preeclampsia.
- **C** She should be kept in the department with strict bedrest and quiet so that a premature birth can be prevented, and the birth can then be induced at term *It is not possible to treat preeclampsia solely with rest*
- D Rest and quiet will normalise the blood pressure and urine findings, and she can therefore be discharged to home with a sick leave Severe preeclampsia does not disappear spontaneously.

# 21

A 38 years old woman wants your advice for very heavy but regular periods. You have taken a smear for cervical cytology and an endometrial biopsy; these results are normal. At bimanual palpation the uterus is anteflexed, freely mobile and judged to be not palpatory enlarged. What would be the first choice of treatment in this case?

- A Embolisation Only in cases of uterine myoma
   B Endometrial ablation This is normally effective, but is an invasive method that requires day surgery as a minimum and is therefore not the first choice.
- C X Hormonal intra uterine device *The most effective of the simple and least invasive treatment options.* 
   D Contraceptive pill
- Contraceptive pills are an option but are generally not as effective as the hormonal coil.

A 30-years old woman has previously had a deep vein thrombosis in her right leg. She used anticoagulants for a while, but now has stopped. She needs a contraceptive and you consider putting her on a progestogen-only pill (desogestrel). You look up in the WHO guidelines which give 4 levels of risks vs. benefits when using the different contraceptive agents. What will be the evaluation for prescribing progestogen pills for this woman?

- **A** The risks exceed the benefits when using this method
- B There is an unacceptable health risk when using this method
   C X Using this method has more benefits than risks
   Soc: http://oppa.who.int/inic/toppa.//o
- See: http://apps.who.int/iris/bitstream/handle/10665/173585/9789241549257\_eng.pdf; jsessionid=296924C6829678BFF5A3BA169EB566F1?sequence=1
- **D** No restrictions when using this method

# 23

Understanding internal working models was an important development in attachment theory. What is this model?

- A An internal working model is the parents' knowledge and understanding of how to provide care to one's child.
- **B** An internal working model is the knowledge parents have acquired through their experiences with children, and which governs how they stimulate their own child
- **C** X An internal working model is a representation of early care experience that affects the child's expectations to parents, and the parents' expression of care to the child. Correct answer. Bowlby (1980) explained internal working models as representations that develop through the child's subjective experience with their caregivers, and which form emotional, cognitive and behavioural responses and expectations in later relationships. These internal working models are activated when one becomes a parent and affect what one thinks and feels in relation to one's own children, and how one provides care to them.
- **D** An internal working model is the child's expectation of care from an attachment figure that they are born with and which is demonstrated by the child communicating from birth.

24

A 16-year old girl has been given the diagnosis "Severe depressive episode without psychotic symptoms".

Which of the most typical symptoms (according to ICD-10) must be present to make this diagnosis?

**AX** Tiredness, decreased energy/activity and decreased interest in things the person is normally interested in. *Tiredness, decreased energy/activity and decreased interest in things the person is normally* 

interested in comprise the three most typical symptoms required to make the diagnosis "Severe depressive episode without psychotic symptoms".

- **B** Tiredness, problems concentrating, loss of self-esteem and decreased energy/activity Tiredness and decreased interest in things the person is normally interested in are two of the three most typical symptoms required to make the diagnosis, while problems concentrating and loss of self-esteem are additional symptoms.
- **C** Decreased energy/activity, feelings of guilt and sadness Decreased energy/activity and sadness are two of the three most typical symptoms required to make the diagnosis, but feelings of guilt is an additional symptom.
- D Decreased interest in things the person is normally interested in, sadness, suicidal thoughts and loss of self-esteem. Decreased interest in things the person is normally interested in and sadness are two of the three most typical symptoms required to make the diagnosis, while suicidal thoughts and loss of self-esteem are additional symptoms.

An 8-year old boy attends the doctor's surgery with his mother. He has stomach ache and has not been to school for 4 weeks. He was examined at the Paediatric Clinic 3 weeks ago, and the paediatrician concluded that there was no evidence for a somatic cause of the stomach pains. The mother relates that she and the boy's father have recently separated and are in conflict about visiting rights for the boy and his little sister who is 4 years old. The boy has recently changed school and has no friends where he now lives. You assess this to be a psychosomatic problem. In this situation, what is the best help you can provide as the GP?

- A X Provide pyschoeducation for the boy and mother on maintaining mechansims. Contact the district nurse and any municipal educational and psychological counselling services for assistance with a gradual return to school over a couple of weeks. New check-up in 2-3 weeks. *Psychoeducation is an important element in the treatment of psychosomatic problems, and it is essential that parents have an understanding of maintaining mechanisms. No signs of wider psychiatric problems have been described nor serious trauma. This type of problem should therefore be managed by the GP with collaboration partners in first-line services. Referral to Child and Adolescent Mental Health Services or extended investigations in the specialist healthcare services is not immediately indicated. Isolation from friends and absence from school could be a possible maintaining factor. Absence from school should therefore be minimised, and postponing return to school by another 4 weeks would not be recommended.*
- **B** Refer to the Paediatric Clinic for extended investigations because the stomach pains have persisted. New check-up in 3-4 weeks.
- **C** Refer to Child and Adolescent Mental Health Services for investigation and assessment of trauma treatment. Contact the District nurse and municipal educational and psychological counselling services, if available, for assistance with a gradual return to school over a couple of weeks. New check-up in 2-3 weeks.
- **D** Apply for carer benefits for the mother, initially for 4 weeks, so that she can be together with the boy the whole time; check the status of the stomach ache and other symptoms that occur. New check-up in 4 weeks.

## 26

Six months ago a 15-year old girl witnessed a dramatic incident in which a person was shooting randomly close to her school killing 5 people and finally him self. One of those killed was the girl's younger sister. Now: she is very sad and anxious, stays at home most of the time with her parents and has not been to school since the shooting. She has problems with insomnia and nightmares, and problems concentrating.

As the girl's GP, what is the most important thing you can do to help her?

- A X Refer to the Child and Adolescent Mental Health Services for investigation and treatment The most probable diagnosis is PTSD. The girl has severely impaired functionality, and has already had problems for 6 months. An awaiting approach is not recommended; it is most important therefore to refer to the Child and Adolescent Mental Health Services. Investigation of PTSD in adolescents includes mapping the incident, family and social relationships, and symptoms of anxiety and depression. Individual therapy, family therapy and group therapy are all used to help children with PTSD symptoms. Many different theories have a role in the range of methods that are offered: psychodynamic theory, behavioural theory, cognitive theory, insightoriented theories, and various theories in family therapy. Unfortunately, there are few treatment studies that have sufficiently documented the effect of the various types of treatment. Of the studies that have been conducted, trauma-focussed cognitive behavioural therapy has been shown to have the best effect. Antidepressants may be relevant, but not as first-choice treatment.
- B Start treatment with antidepressants, instruct her in sleep hygiene and give her a new appointment in 4-6 weeks
- C Start treatment with antidepressants, give her a sick note for school and a new appointment in 2-3 weeks
- **D** Weekly meetings for 1-2 months, then refer to the Child and Adolescent Mental Health Services if there is no improvement

Per is ten years old. His teacher contacts you because you are the school doctor. He describes Per as precocious and odd without close friends. He seems happiest alone. He speaks adequately, but talks about others using numbers instead of names. For his age he has very advanced mathematical knowledge, but is struggling with concentration in class, and is struggeling with his handwriting – he has been given a PC. If somebody jolts him he can become very angry.

What is the most important diagnostic criterion for the most probable psychiatric condition in this child?

# A Motor clumsiness

- **B** X Deviating contact and social functioning He shows signs of deviating contact, communication and social functioning, and very special interests. These are the traits that determine his function. Thus, the most probable condition is autism spectrum disorder; Asperger's syndrome. Concentration problems, motor problems and lack of emotional flexibility can be associated traits, as can high intelligence "pockets" in some, but are not diagnostic criteria.
- C High intelligence and special skills
- **D** Difficulties in regulating emotions

## 28

Compulsive disorder (obsessive-compulsive disorder - OCD) can occur in children, adolescents and adults.

What is the prevalence of this disorder in children and adolescents?

A Less than 0.5%

- BX 1-2% Correct answer.
- **C** 3-4%
- **D** More than 5%

# 29

A 9-year old boy has a "difficult temperament" with a lot of anger. The following problems have developed since he was 7 years old: He gets up to a lot of mischief, boycotts school work, disregards rules, is restless, bullies others and often get into fights. Which treatment has a documented effect on his condition?

A Psychodynamic therapy

**B** X Parental training in behavioural regulation

The probable diagnosis is conduct disorder with pronounced aggression and distruptive behaviour which crosses expected social norms for the age and/or breach other people's boundaries (violence, etc.). For this condition, parental training programmes in behavioural regulation have a documented effect. There is currently no comparable documentation for the effectiveness of psychodynamic therapy, central nervous system stimulants (which are indicated in hyperactivity disorder/ADHD), or neuroleptics (which are not specifically indicated or documented in behavioural disorders, but can be used in the event of concomitant impairment of mental development and severely disturbed behaviour).

- C Stimulants acting on the central nervous system
- D Neuroleptics

# 30

In addition to increased mood, what cerebral effects does cannabis have?

- A Slower respiration rate, poorer memory, planning and organisation ability.
- Slower respiration rate is more typically an effect of opiates, and is not associated with cannabis.
   B Slow motor responses, improved concentration, planning and organisation ability. Concentration becomes poorer when using cannabis, but can be increased by central nervous system stimulants.
- **C** Faster motor responses, improved memory, planning and organisation ability. *Motor responses are typically slower with cannabis use. Memory and concentration are typically poorer with cannabis use.*
- **D X** Slow motor responses, poorer memory, planning and organisation ability. *Correct answer*

In your general practice, you see a 14-year old girl. During the appointment she says that she often feels so depressed that she cannot bear to be with her friends any more. Her life has become so difficult because of the "strange thoughts" as she calls them. She says that she thinks most surfaces and places outside her home are infectious; therefore she can't take home things she has used at school, and that she must first wash her hands and then have a shower and change her clothes when she comes home from school or a trip to town. She justifies this by saying she is afraid of being infected, because she can't know whether the person who recently sat in a chair or touched an object could have been sick and infectious. Neither can she eat unknown food because that could be dangerous. Deep inside she knows that these thoughts are exaggerated, but she cannot control them. What is the most probable explanation of her symptoms?

- A X The patient has an obsessive-compulsive disorder. The difference between this correct answer "obsessive-compulsive disorder" and the three other diagnoses depression, anxiety and psychosis is the description of obsessive actions in addition to the pronounced avoidance behaviour - for example that she must shower and change clothes.
- B The patient has an anxiety disorder.C The patient is developing psychosis.
- **D** The patient has depression with psychotic thoughts (depressive psychosis).

# 32

A girl (15 years old) has been admitted to the somatic paediatric department, and the department is conducting a suicide risk assessment of the girl.

What are the most important areas to be mapped in this assessment?

- A Psychiatric disorders in the family, actual medical history, actual suicidal thoughts/plans, family/ care situation, protective factors and current psychiatric status
- **B** Current psychiatric status, actual substance use, actual suicidal thoughts/plans, previous psychiatric disorders, review of risk factors and protective factors
- **C X** Actual medical history, actual suicidal thoughts/plans, review of risk factors, current psychiatric status, family/care situation and protective factors Actual medical history, actual suicidal thoughts/plans, review of risk factors, current psychiatric status, family/care situation and protective factors are all important areas in suicide risk assessment of children and adolescents which have emerged from research and national guidelines, which there have also been lectures on.
- **D** Actual medical history, actual suicidal thoughts/plans, actual substance use, previous psychiatric disorders, review of risk factors and protective factors

# 33

Hyperbilirubinemia is a condition that we often see in the neonatal unit. Which of these statements is correct in regard to a newborn infant?

- **AX** Conjugated bilirubin that is not excreted can be converted back to unconjugated bilirubin *Correct answer.*
- **B** A newborn baby can have a significanlty lower bilirubin production than an adult Incorrect answer. A newborn baby has a high production of bilirubin in part due to rapid breakdown of erythrocytes, reduced conjugation due to an immature enzyme system, reduced excretion across the intestines and increased enterohepatic circulation.
- **C** A newborn baby is visibly yellow only when bilirubin levels are higher than 200 micromol/L *Incorrect answer. One can see that a child is yellow with levels as low as 80-90 micromol/L*
- D Unconjugated bilirubin cannot cross the blood-brain barrier Incorrect answer. Unconjugated bilirubin is fat soluble and toxic precisely because it can cross the blood-brain barrier. This can result in Kernicterus

You are a GP and are contacted by a 13-year old girl who is your patient. She arrives with her mother. The girl says that she was out with some friends the night before. There she met a 19-year old boy and went with him to his room. There he allegedly forced himself on her and had vaginal intercourse which resulted in genital bleeding.

The girl told her parents about this in the morning and they have come to your surgery. What will you do?

**AX** You send the girl as an emergency to the nearest Paediatric Dept. for urgent evidence collection, documentation of injury and health care. This is the most urgent. The police can be contacted afterwards.

- You say that the girl and mother must first notify the child welfare services, and that you will send R a note of concern there.
- This is not initially a typical case for the child welfare services, as the perpetrator is not a member of the family.
- С A pelvic examination is performed, findings are documented and emergency contraception is provided. Afterwards, you ask them to contact the police. Evidence collection is lacking here - a factor that is very important.
- You say that the girl must first of all go to the police, and you recommend that the girl and her D mother contact the Criminal Dept as soon as possible. The case should also be reported to the police, but first evidence must be collected, any injury documented and health care must be provided.

# 35

You are the GP and examine a 2-year old boy who was born prematurely with a gestation age 30 weeks. The boy needed light respiratory assistance for 3 weeks in the neonate period. For the presenting medical history, the mother says that the boy has generally been healthy, but quickly becomes chesty when he plays with his dog or gets a cold. The mother says that the boy's sleep is often disturbed, and particularly in the morning he is bothered by a lot of coughing and mucous. Several family members have a known allergy, but the boy has not yet been tested. What is the most probable diagnosis and what will you do now?

- The boy is most probably allergic and should be tested for allergy to animals Α Incorrect answer.
- The boy most probably has a viral infection and you start inhalation treatment В Incorrect answer.
- С The boy most probably has bronchopulmonary dysplasia (BPD) and you start inhalation treatment Incorrect answer.
- D X The boy most probably has asthma; you start treatment and refer for investigation for allergies Correct answer.

# 36

You are the GP. Ole is 6 years old and attends his appointment with you with his mother. The mother says that Ole has a tight foreskin; it is not possible to retract the foreskin back over the head of the penis. Ole doesn't have any problems with this normally; he has not had any infections and the foreskin does not swell up when he urinates. What is the correct action?

- **AX** Put the mother's mind at rest that since Ole doesn't have any problems one can wait. In most cases, the foreskin eventually gets less tight.
- Tight foreskin without any problems is normal and does not require treatment
- В Treat with corticosteroid ointment for a few weeks to soften the foreskin
- С Refer for surgery for tight foreskin (dorsal slit/circumcision)

You are a GP. A mother and father come to you with their newborn baby (6 weeks old). They have recently noticed a lump in his right groin. The parents say that the lump is soft and can be pressed back. When you examine the child you cannot find anything wrong in the right groin. What is the correct action?

- A Refer for ultrasound querying the presence of enlarged lymph nodes in the right groinB X Refer for surgery for a suspected inguinal hernia
- A history of a lump in the groin in a child indicates an inguinal hernia and requires surgical evaluation
- **C** Reassure the parents that you cannot find anything wrong with the child

# 38

Lina is 8 months old and was born after a normal pregnancy. Over the last few days she has had a cold with fever, but is still in general good health. The mother comes to your surgery as the girl's GP. At clinical examination your only finding is a low frequency, musical systolic murmur that has not been registered previously. In a sitting position the murmur becomes weaker and disappears almost completely when the girl stretches backwards. What is the most probable diagnosis?

- A PDA
- *In this case a more swirling systolic and diastolic murmur would be heard* **B** Pulmonary stenosis
- Systolic murmur that does not change with change of position
- C VSD
- Most often a systolic murmur that does not disappear with a change of position **D X** Still's murmur

Correct answer. The girl has not previously had a murmur and her cold with fever can have provoked the murmur. Still's murmur is characterised by variation with a change in position, and it is often weaker when sitting and can disappear completely with hyperextension of the chest

# 39

You are working as a doctor in Paediatric emergency reception. A critically ill child arrives that is now one week old. The girl was born after a normal pregnancy and the paediatric examination on day 1 was completely normal.

Over the last few hours the girl has become increasingly ill with rapid respiration, and costal and subcostal retractions; she is peripherally cold with grey, pale skin and has a capillary refill time of 4 sec. You palpate an enlarged liver and find no femoral pulses. When you auscultate the child you hear a weak systolic murmur.

Which treatment must you start as emergency help?

- A i.v drip with indomethacin
- Incorrect answer. Indomethacin is used in premature babies to close the ductus arteriosus **B X** i.v. drip with prostaglandin
- This is most probably coarctation of the aorta and i.v infusion with prostaglandin must be started immediately to prevent closure of the ductus arteriosus. After this, the child can be transferred to Rikshospitalet for surgical intervention
- C i.v drip with furosemide Incorrect answer. Treatment to increase diuresis is not relevant
   D i.v drip with dopamine
- Incorrect answer

The frequency of meningitis in children has dropped in recent years in a number of European countries. This is due to a number of reasons. What is the most important reason?

- A Inclusion of conjugate vaccines against Haemophilus influenzae and meningococci in the national vaccination programmes
- **B** Fewer pneumococci (unknown cause), and inclusion of vaccine against meningococci in the national vaccination programmes
- C Inclusion of conjugate vaccines against meningococci and pneumococci in the national vaccination programmes
- **D** X Inclusion of conjugate vaccines against pneumococci and Haemophilus influenzae in the national vaccination programmes

# 41

What are the most common food allergies in children under 3 years of age?

- A Cod and egg
- **B** Nuts and shellfish
- C Wheat and soya
- **D X** Egg and milk

# 42

10-month old Jørgen has a high fever. The doctor demonstrates purulent otitis media in the left ear. *Which treatment should the doctor recommend?* 

- A Amoxicillin and paracetamol
- **B** Erythromycin and paracetamol
- **C X** Phenoxymethylpenicillin and paracetamol
- D Plenty of fluids and paracetamol

# 43

Karoline (7 months old) has previously been healthy with no tendency to atopy. She has a fever, nasal congestion and problems breathing, and the last 24 hours she has been listless and will not feed. When examined at the hospital she is pale, has a respiration rate 65/minute with sub- and intercostal retractions. Capillary refill time < 2 seconds and pulse 140/minute. Oxygen saturation 90%. Crackling can be heard over both lungs on both sides with prolonged expiration. Blood tests reveal:

Blood test	Result	Ref. range
CRP	43 mg/L	< 5 mg/L
Hb	10.8 g/dL	10.8 – 13.5 g/dL
Leukocytes	7.8 x 10 <sup>9</sup>	4.0 – 20.0 x 10 <sup>9</sup> /L
рН	7.30	7.35 – 7.45
pCO2	7.35 – 7.45	4.5 - 6.0
BE	-6	-3 - +3

She is given fluids and oxygen.

Which other treatment should she have?

A Saline nasal drops, saline or beta-2 agonist inhalation

**B** Penicillin, saline or racemic adrenaline inhalation

- **C** Steroids, penicillin, saline or racemic adrenaline inhalation
- D X Saline nasal drops, saline or racemic adrenaline inhalation
  - The medical history is typical for aute bronchiolitis (without risk factors for asthma/atopy). This is the recommended treatment.

Why is the relationship between the number of chest compressions and ventilations different for newborn infants (3:1) and adults (30:2) at resuscitation in connection with cardiac arrest?

- A The residual volume of the lungs in newborn infants is poorly developed
- **B** 100% oxygen will harm a newborn infant
- **C** Newborn normally have a higher heart rate than adults.
- **D** X The cause of cardiac arrest in newborns is normally hypoxia.

45

Eva (15 years) has asthma and uses an inhalation medication with a combination of long-acting beta-2-agonist and glucocorticoid twice daily. She has previously reacted to peanuts, hazelnuts and fish/seafood with a rash and stomach ache. Eva attends your surgery now because she has a slight problem breathing shortly after eating crisps and the packet stated that it could contain traces of peanuts. The medical secretary calls you urgently to the waiting room because she has become worse. When you get there, her lips are blue, she has great difficulty breathing and she appears to be losing consciousness. You ask the medical secretary to get the oxygen cylinder. Which medical treatment should you give Eva first?

- **A** Antihistamine intramuscularly
- BX Adrenaline intramuscularly
- **C** Glucocorticoid intramuscularly
- **D** Beta-2-agonist as inhalation

46

A 2-year old boy comes to check his heart condition. Clinical examination reveals a grade 3/6 high frequency ejection systolic murmur at the upper right sternal edge radiating to the carotid vessels. What is the most probable diagnosis?

- A Ventricular septal defect
- B Pulmonary stenosis
- **C X** Aortic stenosis
- **D** Aortic insufficiency
- E Mitral stenosis

# 47

A 6-year old girl was referred to the department for suspected sexual abuse by an uncle. The girl has told her teacher that "my uncle put his finger in my wee wee hole (vulva/vagina)". It is unclear when this was supposed to have happened.

You examine the girl and find that everything is normal, including examination of the genital organs and anus. You note in particular that the hymen is sharp-edged and without signs of damage. Later that evening the police call, and ask for preliminary information on the results of the examination. You have a written exemption from the duty of confidentiality from the parents. What do you say to the police?

- **A** That everything looks normal. This does not exclude sexual abuse, but it does exclude abuse with penetration of the vagina.
- **B** That everything looks normal, and it is completely improbable that the girl has been the victim of sexual abuse.
- **C X** That everything looks normal, but this does not exclude that the girl has been the victim of sexual abuse.
- **D** That everything looks normal so the girl's statement is probably an expression of her childish imagination.

A 3-year old girl with watery stools several times a day for 3 days has been admitted to hospital due to dehydration. She does not have a fever. What is the most probable cause of the diarrhoea?

**AX** Viral infection

- Viral gastroenteritis is the most common cause of watery diarrhoea in children. Often caused by norovirus, rotavirus (but more seldom after vaccination), or adenovirus В
- Ulcerative colitis Often more prolonged duration, often concomitant blood and mucus С **Bacterial infection**
- More rare cause compared ti viral infection. More often bloody diarrhoea. D Malabsorption Can cause diarrhoea, but rare watery.

49

What does investigation of red reflex in the neonate give particular information about?

**AX** The refractive system and retina

- The neonate's vision at close hold В
- С The size of the pupils and reaction to light
- D Squinting (strabismus)

## 50

A girl is referred from the health centre because her growth has dropped from the 50th percentile at 4 years of age to the 10th percentile at 6 years of age. She has previously had problems with constipation, and now has problems with stomach pains. Her mother's height is 167 cm and her father's height is 180 cm.

Which assessment of this growth pattern is most correct?

- **AX** The growth pattern is pathologic and must be investigated to determine any underlying chronic disease.
- В The girl's current height lies within the normal variation of the mid-parental height, and does not need to be investigated further.

Both parent's heights lie on the 50th percentile. The point of this task is that you must know that it *is pathological to cross a percentile channel.* Classic growth hormone deficiency could give this growth pattern, and the girl should therefore be

- С investigated further.
- The growth normally varies from year to year, and the girl's height should therefore be checked D annually.

During the autumn and winter (last six months), a 5-year old boy with atopic eczema has had 3 longterm respiratory infections with symptoms from the lower respiratory tract for more than 3 weeks. The first 2-3 days of each infection, he has had a slight fever and runny nose. Afterwards he has been fever-free, but has had a cough, mucous in the lower airways, cough with phlegm vomiting at night, heavy breathing and sometimes wheezing. He feels it is more difficult to breathe when he is outside playing. The boy attends your health centre with his mother. He has not had a fever or runny nose the last week, and has been to nursery school.

What should you do with him at your surgery?

A Clinical examination; take a blood sample for CRP analysis and consider a course of antibiotics if CRP >50.

He has not had a fever the last week. These are long-term symptoms. Bacterial infection is unlikely.

**B** Clinical examination; take a sample of nasal secretion for analysis for a panel of respiratory viruses to elucidate the agent.

He has not had a runny nose the last week. He has had long-term symptoms that are probably triggered by a number of respiratory tract viruses as he attends kindergarten where many children are in close proximity and various viruses are present in the environment. If a virus is detected in a nasal secretion test now, it may be the triggering factor for the present condition, but nevertheless does not explain the sympoms over the last six months. There is no specific treatment for the virus.

- **C** Clinical examination; spirometry investigation at the health centre, then consider a short course of peroral steroids if the spirometry is abnormal. A child of 5 has little ability to perform a spirometry investigation because of technical difficulties. Spirometry would therefore not be representative and could be interpreted incorrectly. A short course of peroral steroids can be considered in the treatment of children with known asthma, which this child does not have.
- D X Clinical examination; inquire about family diseases, start inhalation treatment with a short-acting Beta2-agonist; follow-up in 6 weeks.
   A family history is important. His medical history of atopic eczema and symptoms of lower respiratory tract infections last autumn/winter could indicate development of asthma. Starting treatment with a short-acting Beta2-agonist and spacer can be effective on his symptoms. At follow-up, the effect will be evaluated and treatment adjusted accordingly.

# 52

For which age group does a rotavirus infection most frequently result in hospital admission?

- A 4 10 years
- BX 3 months 2 years

It is actually most frequent from 3 months - 2 years. This is the period after loss of maternal antibodies and when a child typically gets their first rotavirus infection, which is the most severe. With subsequent rotavirus infections the child is older, and it is believed that the earlier rotavirus infection gives them a certain protection so that a new infection is normally not so serious that it results in hospital admission.

- **C** 2 4 years
- **D** >10 years

53

Mother is in her second pregnancy, blood type 0 Rhesus +. The pregnancy has been normal. The birth occurs spontaneously at term without complications. Birth weight 3,410 g. When 12 hours old, the staff notice that the baby appears yellow. Bilirubin is 259  $\mu$ mol/L (Light-treatment threshold at this timepoint is 120  $\mu$ mol/L, exchange transfusion threshold is 450  $\mu$ mol/L). General health is good. What is the most probable condition?

- A Neonatal GBS sepsis
- **BX** ABO incompatibility
- C Physiological neonatal jaundice
- D Rhesus incompatibility

During the autumn, 12-year old Siri has appeared very tired, but she has gone to school and played handball. Her mother has previously had a lot of migraine and a cousin has epilepsy. The parents take the girl to the doctor's because of headache and vomiting in the morning over the last 2-3 days. At examination at the health centre, she appears pale and quiet. BP 100/60, pulse 78/minute. There are no definite pathological findings at clinical examination, but the doctor is uncertain whether there are blurred papillary margins in the left eye.

Which diagnosis should be suspected and what should the doctor do?

- A Congenital AV malformation; refer for cerebral MRI
- **B** Migraine; prescription for ibuprofen and an appointment for follow-up
- **C** X Brain tumour in the posterior cranial fossa; admission to hospital
- D Subarachnoid haemorrhage; admission to hospital

#### 55

A previously healthy young student aged 20 attends your surgery for the second time due to symptoms from her bladder. A week ago you gave the patient a 3-day course of Selexid for what you interpreted as an uncomplicated urinary tract infection. She felt better immediately after starting the course, but the frequent urination and burning has returned. What do you do now?

- A You assume that Selexid was not the correct antibiotic and switch to Ciproxin, which is a wide spectrum antibiotic. You give 500mg x 2 for 5 days. In this case it is important to take a urine sample for culture. Ciproxin should not be used for what
- is assumed to be an uncomplicated urinary tract infection.
  B X You test with a urine dipstick and send urine for bacteriological investigation. Switch the antibiotic to Bactrim 2 tbl x2 for 1 week. Here you have taken urine for culture. You are also testing for chlamydia, or other sexually transmittable diseases. Since she has symptoms, you switch to Bactrim which can cover bacteria in this group.
  C Because the treatment had an effect on the patient's symptoms you consider that the treatment
- **C** Because the treatment had an effect on the patient's symptoms you consider that the treatment duration was too short. You give her a new prescription for Selexid, this time for a 1-week course of treatment. In this case it is important to test the urine for the type of bacteria. If a 3-day course of treatment
- has not been effective, the wrong antibiotic has most probably been used.
   D You test with a urine dipstick and send urine for bacteriological investigation. You await the results of urine culture before prescribing antibiotics. Because the patient has recurring infections, you refer her for cystoscopy.

Cystoscopy is not necessary in young women with such a short history of illness.

56

What is the first-choice of treatment for an MS patient with urge and mild incontinence?

- A Botox injection into the bladder
- *Is used if anticholinergics are not adequate* **B X** Anticholinergics
- Reduces bladder activity and can be adequate treatment for moderate problems. Is generally the first choice.
- **C** BCG injection into the bladder
- Is used in carcinoma in situ and stage T1 cancer of the bladder
   D Alpha-reductase inhibitor
   Is used in benign prostatic hyperplasia

One of your GP patients has now had kidney stones for the second time. The stone has been analysed and is a calcium oxalate stone. The patient wonders whether you have any good advice to avoid the formation of new stones. What do you recommend?

- A With calcium oxalate stones it is important to acidify the urine. This can be done by drinking orange juice every day.
- Incorrect. It has nothing to do with acidity.
- **B X** The patient shoud drink at least 2 litres per day. The only prophylaxis against new stone formation is drinking more fluids. The recommendation is 2-2.5 litres.
- **C** With calcium oxalate stones, the patient should not eat rhubarb or red meat. There is no research that supports banning any foods for patients with stones. A normal moderate diet is recommended
- **D** The patient shoud reduce the intake of milk and cheese because the stone is made primarily of calcium.

If the patient has a normal intake of milk products, there is no point in reducing these. Quite the opposite, this could result in more stones. So milk products must be taken as part of the diet.

# 58

For several years, you have had a woman with MS as your patient at your GP surgery. She has now been investigated for problems with urge incontinence and slight leakage. Which two investigations are the most relevant?

**AX** cystoscopy and urodynamics

Cystoscopy must always be performed to exclude any pathology in the bladder. Investigation with urodynamics is necessary to evaluate the detrusor for uninhibited contractions. This can often result in urine leakage. Patients with MS can also have problems emptying the bladder; urodynamics allows mapping the flow and residual urine.

- B cystoscopy and urodynamics if the patient has residual urine It is not sufficient to investigate only when the patient has residual urine. The patient can have uninhibited contractions which are also important to diagnose if we are to provide the correct treatment.
- **C** cystoscopy and three-phase CT of the urinary tract *CT is not performed for this indication.*
- D cystoscopy and measurement of residual urine Can be performed but is not sufficient

# 59

Which symptoms or findings must you as the GP be particularly aware of in a patient whom you presume has an episode of kidney stones?

# A macroheamaturia

Macrohaematuria is often seen with stones, but is not dangerous. Separate investigations are not necessary if the haematuria ceases when the stone has gone

**B** palpation tenderness in the costovertebral angle There may be palpation tenderness in the costovertebral angle but this is not sufficient evidence of urine obstruction

C X fever

Fever is the most serious finding because the patient can develop urosepsis. The patient must in that case be admitted to hospital.

D severe pain The pain itself is very hard for the patient but not normally the most dangerous symptom.

Kidney or ureter stones can pass spontaneously. How large must a stone be for it to most probably need removal by surgery

# A 7mm

B X 5mm Stones larger than 5 mm generally need to be removed by surgery.
C 10mm D 12mm

61

In overactive bladder or urge incontinence which is not treated succesfully with medication or bladder exercises, botox treatment can be an option.

Which statement is correct?

- A The treatment gives lower reservoir capacity.
- **B** Botox is contraindicated in neurogenic bladder dysfunctions.
- **C X** Clostridium botulinum toxin is a potent toxin that paralyses the bladder muscles.
- **D** The treatment gives permanent paralysis of the bladder muscles.

# 62

Which of the statements about prostate cancer is correct?

- A Prostate cancer only affects men older than 60.
- **BX** Prostate cancer is the most common form of cancer in men in Norway.
- **C** PSA is always elevated in prostate cancer.
- D Tissue samples are taken assisted by MRI.

# 63

A previously healthy man aged 35 comes for a health check-up in connection with a new job. You perform a urine dipstick test which shows +2 for blood. The patient has an uncle with kidney stones. What should you do?

- A Order CT urinary tract and cystoscopy.
- B Order CT for the stone.
- **C X** Check the urine with a new urine dipstick test in 2-3 weeks.
- **D** Check the prostate-spesific antibody (PSA), perform a digital rectal examination (DRE) and serology for sexually transferable diseases (STD).

# 64

A 62-year old woman was admitted as an emergency 8 days after an uncomplicated Robot hysterectomy for benign myomas. She has pain in her right flank and nausea. She has cold sweats and chills, and is pale. Pulse: 120/min, blood pressure (BP) 80/50, and Temp 39.8°C. Blood tests reveal normal creatinine and electrolytes, elevated infection parameters and a haemoglobin (Hb) of 12.6 (pre-op Hb was 15.2). Emergency ultrasound of the abdomen reveal right-sided hydronephrosis and hydroureter as well as moderate amounts of free fluid in the pelvic cavity. The time is 22:00. How should the patient be treated?

- A The patient should be given intravenous antibiotics and emergency surgery for insertion of a JJ stent in the right ureter.
- **B** The patient should be taken directly to the operating theatre for exploratory laparotomy due to probable postoperative bleeding; possibly with an abscess.
- **C X** The patient should be given intravenous antibiotics and referred for emergency insertion of a nephrostomy tube.
- D The patient should be given intravenous antibiotics and ultrasound-guided drainage of a possible abscess in the pelvic cavity. The patient is in septic shock and needs acute relief; in this case nephrostomy is the best solution. Creatinine may not necessarily be elevated as the other kidney is functioning normally.

A 22-year old woman attends for a repeat prescription for contraceptive pills. She feels well, exercises regularly and works in a nursery school. You measure her blood pressure to be BP 160/100. What should you do?

**A X** Ask her to come back in a few days to take a new blood pressure measurement and blood and urine samples.

Three blood pressure measurements at three different consultations are required to make the diagnosis of hypertension. Informative blood samples and urine samples should be taken to evaluate any effect on the kidneys.

- **B** Give her an appointment in a few days for 24-hour blood pressure measurement.
- **C** Contact the local hospital for admission and further investigations.
- **D** Start treatment with a calcium antagonist, Adalat Oros 30 mg x 1 and give her an appointment for check-up in 1 week.

# 66

In nephrotic syndrome there is always a primary or secondary glomerular disease. In which glomerular disease is it important to look for an unrecognised cancer?

- A Minimal change nephropathy
- **B** X Membranous nephropathy
- C Diabetic nephropathy
- **D** IgA nephropathy

# 67

IgA nephropathy can sometimes develop to chronic progressive kidney disease. Which clinical finding/sign best signals that the disease is progressing to a more serious phase?

**AX** Increasing proteinuria.

- **B** More dysmorphic erythrocytes are observed at urine microscopy.
- C Oedema
- D Episodes with macroscopic haematuria.

# 68

Morten (52 years of age) has diabetes, hypertension, cardiac failure and impaired renal function eGFR 42 ml/min/1.73 m<sup>2</sup> (>60 ml/min/1.73 m<sup>2</sup>) and albuminuria with albumin/creatinine ratio 60 mg/mmol (<3 mg/mmol). At examination, his BP is 128/73 mmHg, and he has very slight ankle oedema. The patient is being treated with a number of drugs including an ACE inhibitor.

The patient wonders whether his impaired kidney function will affect his risk of cardiovascular disease in the future and whether the albuminuria means anything.

Which of the following statements is the most correct?

**A X** Chronic kidney failure and albuminuria are two independent risk factors for cardiovascular disease.

- **B** Chronic kidney failure increases the risk of cardiovascular events and albuminuria has no additional effect.
- **C** Chronic kidney failure increases the risk of cardiovascular events but not for stroke.
- **D** Chronic kidney failure is only associated with an increased risk of cardiovascular disease when eGFR<15 ml/min/1.73m<sup>2</sup> (>60ml/min/1.73 m<sup>2</sup>).

Kåre (44 years old) has had chronic kidney disease for 5 years. A biopsy has not been taken, but it is suspected that he has hypertensive kidney injury. He has now been admitted due to severe pneumonia, and there has been a gradual increase in s-creatinine over the last week - 160 umol/L increasing to currently 480 umol/L (normal range: 50-100 umol/L). Serum potassium has also increased from 5.3 mmol/L to 5.9 mmol/L (normal range: 3.5-5.5 mol/L) at the last ordinary sample taken this morning.

Kåre has slightly increasing dyspnoea during the evening, and you therefore take a sample for blood gasses which reveals relatively unchanged values for oxygen and carbon dioxide (pO2 9.2 (normal range: 11-13), and pCO2 7.1 (normal range: 4.5-6.0)). The results show however that serum potassium has increased to 6.9mmol/L. What should you do now?

- Correct his acidosis by giving bicarbonate supplement so that more potassium is transported into Α the cells.
- В Check the blood test results by sending a new sample to the laboratory.
- Refer for groin catheterisation and prepare to start haemodialysis within the next few hours. С
- **D** X Take an ECG, start glucose-insulin i.v. infusion and check serum potassium in 2 hours.

# 70

An 86-year old woman was found lying on the floor in her bathroom with right-side peripheral paralysis. She had been lying on the floor for about a day before her daughter came by and found her. In A&E she is awake, but has reduced sensitivity and movement in her right upper and lower limbs. A month ago she had been for her annual check-up with her GP who had found slightly elevated blood pressure, atrial fibrillation, normal blood and urine tests, including normal eGFR. She is taking an anticoagulant (Marevan) because of the atrial fibrillation, and 1 tablet NSAIDS (Voltaren) a day due to arthritis.

You find BP 105/64 mmHg. S-creatinine 246 µmol/L (45 - 90 µmol/L). Urine dipstick reveals 4+ for blood and 1+ for leukocytes and albumin.

What is the most probable cause of the acute renal damage?

**AX** Acute renal damage due to rhabdomyolysis and dehydration The patient has been lying on a (warm) bathroom floor and received compression damage to the muscles. The myoglobin that is excreted from the damaged muscle is toxic for the kidneys, particularly when the patient is dehydrated. Myoglobin is expressed as blood on the urine dipstick.

- Acute renal damage due to use of NSAID В
- С Embolism in the kidneys due to atrial fibrillation
- D Acute renal damage due to renal haemorrhage

# 71

A 65-year old woman has chronic kidney disease due to nephrosclerosis. Her kidney function has gradually gotten worse and the last measurement gave eGFR 18 ml/min/173m<sup>2</sup>. At the last check-up Hgb was measured at 8.9 g/dl versus 9.4 (11.7 - 15.3 g/dL) 6 months ago. You perform an anaemia screening and find that it is a normocytic normochromic anaemia. What is probably the most important cause of her anaemia?

- B12 deficiency Α
- В Haemolysis
- Iron deficiency С
- **D** X Erythropoietin deficiency
  - Such a low GFR will cause an erythropoietin deficiency in the kidneys and thereby decreased erythropoiesis.

A 60-year old woman with cardiac failure and normal kidney function (eGFR > 90 ml/min) has started diuretic treatment with a loop diuretic (Furosemide) 40 mg in the morning and evening. She notices this is effective with good diuresis after taking each tablet.

Some weeks later she feels less well, and notices pronounced muscle weakness, but it is easier to breathe. Her blood pressure is measured at 135/80mmHg.

Which of the following is the most probable reason for her muscle weakness.

# A Hypernatremia

- **B** X Hypokalemia
- Diuretics will lower potassiium. This will change the resting potential in muscle cells causing muscle weakness. None of the alternatives will cause these problems, and neither are they common complications when using loop diuretics.
- **C** Hyperkalemia
- **D** Hyponatremia

# 73

A 78-year old woman is admitted after being found lying in the bathroom in her flat. She is fully conscious, but her right-side limbs are paralysed, and she has therefore not been able to raise herself up off the floor. She has had access to water from a tap low down on the wall. She has lain there for 2 days. At admission she is anuric with serum creatinine of 500 micromol/L. Her blood pressure is normal and she does not feel thirsty. The woman is now being monitored due to oliguric kidney failure. You must prescribe fluid treatment for the next 24 hours. **How will you do this?** 

- A Indicate a desired volume of fluid and specify the types of fluids (e.g. 1,000 ml Nacl i.v. and by mouth about 1,000 ml water)
- **B** X Indicate a desired fluid balance and specify the types of fluids (e.g. 2,000 ml, use alternating Ringer's and Na-bicarbonate 167 mmol/L) This gives a more flexible and ongoing assessment of the fluid status. You avoid ending up in a completely different situation than that planned. This can be demanding for nurses and doctors but is clearly better for the patient.
- C Indicate a desired fluid balance generally indicated as +, or 0 balance depending on urine production, perspiration, medication fluids and other infusions, peroral intake, loss as diarrhoea or via drains, etc. (e.g. +2,000 ml)
- **D** Indicate a desired volume of fluid to be administered (e.g. 2,000 ml)

# 74

A 35-year old man has just been diagnosed with hypertension by his GP; average blood pressure measured is 152/97. He is somewhat overweight, weighs 98 kg and is 178 cm tall, corresponding to BMI 31. He does not smoke and appears otherwise healthy. What is the most correct first course of action?

A Refer him for investigation for secondary hypertension Nothing in the presenting medical history indicates secondary hypertension

- **B X** Start lifestyle interventions and map cardiovascular risk; new check-up in about 3 weeks *Comment: Source: Journal of Hypertension 2013, 31: 1281-1357 and the Norwegian Directorate of Health Guidelines*
- C Start antihypertensive treatment with calcium antagonist; new check-up in about 3 weeks
- **D** Start antihypertensive treatment with an ACE inhibitor or angiotensin 2-antagonist; new check-up in about 3 weeks

Sverre is 35 years old and has had diabetes mellitus type 1 for 5 years which is well-controlled. Recently, he has felt tired and had a tendency to faint when he stands up from sitting. Even though he has not made any changes to his insulin regimen or lifestyle, he has more frequent and more serious attacks of hypoglycaemia than before.

What is the most probable cause of these changes?

- A Secondary adrenal insufficiency
- **B** Hypothyroidism
- **C** Malabsorption
- **D** X Primary adrenal insufficiency (Addison's disease)

## 76

A prevously healthy 31-year old woman is pregnant with her first child. From week 8-9 of the pregnancy she has had increasing palpitations, feels hot and sweats, in addition to increasing nausea. You are her GP. When you examine her, her blood pressure is 110/55, pulse 74 regular, indications of finger tremors, slightly clammy skin. No struma, no palpation tendernesss over the thryoid gland. Blood test results:

	Patient	Reference range
Serum Human Choriogonadotropin (HCG)	83 000 IE/L	Non-pregnant < 3IE/L
C-reactive protein	3 mg/dl	< 5 mg/L
Free thyroxine (FT4)	30.2 pmol/L	12.0 - 22.0 pmol/L
Thyroid Stimulating Hormone (TSH)	<0.01 mIE/L	0.27 - 4.20 mIE/L
Anti-TPO (Anti-thyroid peroxidase)	25 kU/L	Negative < 35 kU/L Positive $\geq$ 35 kU/L
TSH receptor antibody (Anti-TSH receptor, TRAS)	< 1.0 IU/L	Negative < 1.0 IU/L Positive ≥ 1.0 IU/L

Which treatment should she have?

- A Start with an antithyroid drug (Neo-Mercazole or Propyltiouracil) at a low dose. Based on the history of illness and biochemistry, the diagnosis is gestational (transient) thyrotoxicosis. The patient does not have elevated TRAS (which is seen in >90% of patients with autoimmune hyperthyroidism) and neither is anti-TPO elevated. During pregnancy, HCG is highest around week 10 and decreases gradually thereafter. HCG can stimulate the TSH receptor and result in transient thyrotoxicosis. This condition resolves after a few weeks and in most cases requires no treatment. This woman has relatively mild hyperthyroidism, and treatment with antithyroid drugs is not advisable since these drugs cross the placenta and can affect the fetus.
   B Give a beta-blocker at low dose, but not an antithyroid drug (Neo-Mercazole or Propyltiouracil).
- **B** Give a beta-blocker at low dose, but not an antithyroid drug (Neo-Mercazole or Propyltiouracil). Not correct. See the answer under A. Beta-blockers cross the placenta and can affect the fetus. Beta-blockers must only be used in pregnancy "if the benefits outweigh the risk to the fetus" (cf Felleskatalogen text). This is not the case with this woman; she has relatively mild symptoms which may in part also be due to the pregnancy.
- **C X** No treatment, but appointment for check-up of metabolism in 2 weeks. Correct answer. See the answer under A. It is important to reassure the patient that this a a temporary condition which in most cases resolves without any treatment.

77

A 35-year old previously healthy man contacts his GP because over the last 4-5 days he has had sweats and palpitations, and influenza symptoms. At examination his skin is clammy, his lungs are normal, blood pressure 130/ 65, pulse 85 regular, and he has extreme palpation tenderness over his thyroid gland. Blood test results:

	Patient	Reference range
Haemoglobin in blood	14.1 g/dL	13.4 - 17.0 g/dL
C-reactive protein	78 mg/dL	< 5 mg/L
Leukocytes	13.5 x 10 <sup>9</sup> /L	3.7 - 10.0 x 10 <sup>9</sup> /L
Free thyroxine (FT4)	55 pmol/L	12.0 - 22.0 pmol/L
Thyroid stimulating hormone (TSH)	<0.01 mIU/L	0.27 - 4.20 mIU/L
TSH receptor antibody (Anti-TSH receptor, TRAS)	< 1.0 IU/L	Negative < 1.0 IU/LPositive ≥ 1.0 IU/L

What is the most probable diagnosis?

#### **AX** Subacute thyroiditis

Correct answer. The medical history and blood tests are typical with elevated CRP, elevated FT4 and suppressed TSH. Palpation tenderness over the gland is a common finding of this condition. B Graves' diseease (autoimmune hyperthyroidism)

- Incorrect answer. The following are not compatible with Graves': Medical history, palpation tenderness over the gland, elevated CRP. TRAS is not elevated, and 90% of patients with autoimmune hyperthyroidism have elevated TRAS.
- С Toxic adenoma in the thyroid gland Incorrect answer. The following are not compatible with this diagnosis: Medical history, palpation tenderness over the gland, elevated CRP.

78

A 60-year old man has an appointment with you because of episodes with sweating, palpitations and anxiety. You measure his blood pressure which is considerably elevated. You refer him for CT of the adrenals which reveals a tumour on the left side. You also order blood tests. What do you expect the results of the blood tests to show in this patient?

High cortisol, low ACTH

- **B** X high levels of metanephrine and normetanephrine (catecholamines) Based on the history of illness, the patient has a pheochromocytoma, and we would therefore expect high levels of catecholamines
- high cortisol high ACTH С
- D high aldosterone, low renin

# 79

A 60-year od woman has an appointment with you because of episodes of sweating which have increased in recent months. Together with this she also has palpitations and anxiety. You measure her blood pressure which is considerably elevated. You now refer her for CT of the adrenals and blood tests. CT reveals a left-side tumour, while the blood results are compatible with pheochromocytoma. The patient has previously been healthy. How would you treat this patient?

- Treatment of the blood pressure with beta-blockers and supplementation with other blood Δ pressure-lowering drugs if no effect.
- **BX** Pre-treat with alpha-blockers for about 2 weeks and then surgery Pre-treatment with alpha-blockers results in relaxation of the blood vessels and reduces the risk of complications in connection with secretion of adrenaline during surgery
- Treat the blood pressure with alpha-blockers and follow the patient with 6-monthly check-ups С
- D Immediate surgery to remove the tumour

A 65-year old woman comes to her GP because of acute back pain that started after a fall on the ice. Previously she has had a fracture of her forearm in connection with a small trauma. She visits her GP wondering whether she can have osteoporosis. She uses a proton pump inhibitor for dyspepsia problems, otherwise she has previously been healthy. Physical examination reveals a height loss of 6 cm.

What treatment would you give this patient in addition to calcium and vitamin D supplements?

- A denosumab (Prolia) s.c. every 6 months
- **B** Alendronic acid perorally once a week
- Alendronic acid can cause gastrointestinal side efffects and i.v. bisphosphonate is therefore the preferred treatment
- C Oestrogen/gestagen
- **D** X zoledronic acid (aclasta) i.v. Bisphosphonate is the first-choice treatment for this patient. Because she has dyspepsia she should have bisphosphonate i.v.

# 81

A 65-year old woman comes to her GP because of acute back pain that started after a fall on the ice. Previously she has had a fracture of her forearm in connection with a small trauma 4 years ago. She has had treatment with Calcigran forte and Alendronic acid after the break. X-ray of the spinal column reveals two compression fractures. Bone density measurement reveals persistent pronounced osteoporosis.

What treatment is now indicated for this patient?

A Zoledronic acid (Aclasta)

- **B X** Teriparatide (parathyroid hormone analogue) This treatment stimulates bone formation and improves the microarchitecture and is the best treatment available for osteoporosis. Due to the high price, one must apply for preapproved medicines available for general reimbursement. Indication for general reimbursement includes fracture during ongoing treatment with a bisphosphonate (Alendronic acid or zoledronic acid) or denosumab
- C Continued Alendronic acid
- D Denosumab (Prolia)

# 82

While being investigated for osteoporosis, a 65-year old man is shown to have high calcium and low phosphate, normal kidney function. He has also recently had a kidney stone. Otherwise his general health is good. What is the most probable reason for his hypercalcemia?

- A Familial hypocalciuric hypercalcemia Ocurs in 10-15% of patients with primary hyperparathyroidism, but is then called normocalcemic PHPT.
- **B** X Primary hyperparathyoidism In primary hyperparathyroidism there is an overproduction of PTH which stimulates increased excretion of Ca from bone resulting in increased plasma levels of calcium. Consequently, osteoporosis develops. Phosphates are often low. The kidney stone is an additional complication
- C Myelomatosis D Tertiary hyperparathyroidism High PTH and calcium as a result of impaired kidney function

A 55-year old woman has been shown to have hypercalcemia at a routine check-up. Her serum level of active vitamin D (1,25 vit D) was elevated, while the serum level of parathyroid hormone was normal.

Which of these conditions explain this pattern?

- Primary hyperparathyroidism Α
- В **Myelomatosis**
- Rare
- CX Sarcoidosis
- Due to increased conversion of 25(OH)D to active vitamin D in the granulomas
- Vitamin D intoxication D

# 84

A 45-year old woman has an appointment with you, her GP, because she is afraid of getting a serious disease in her breasts. She examines herself sporadically, and is a little unsure of whether this is good enough. She wants a doctor to examine her. How do you examine this woman?

- You ask the patient to pull up her clothes on the upper part of her body. You examine both breasts Α and the relevant lymph nodes which are the supraclavicular, infraclavicular and axillary nodes. Not good enough. The patient must undress the upper part of her body. Visual inspection is part of the examination in addition to examination of both breasts and the relevant lymph nodes which are the supraclavicular, infraclavicular and axillary nodes.
- **BX** You ask the patient to undress the upper part of her body. After visual inspection, you examine both breasts and the relevant lymph nodes which are the supraclavicular, infraclavicular and axillary nodes.

*Correct answer. Cancer in the breasts can spread to these lymph nodes.* You ask the patient to undress the upper part of her body. After visual inspection, you examine С both breasts and the relevant lymph nodes which are the neck, supraclavicular, infraclavicular and axillary nodes.

Almost correct, but the neck lymph nodes are not relevant for the breasts.

D GPs have too little experience with clinical examination of the breasts; so the patient is referred to a breast surgeon.

Incorrect answer. GPs are good at examinations. You ask the patient to undress the upper part of her body. After visual inspection, you examine both breasts and the relevant lymph nodes which are the supraclavicular, infraclavicular and axillary nodes.

You are a doctor in the surgical department and see a patient in the out-patients' clinic. This is a 40year old woman who has been diagnosed with breast cancer. She has had a mammography, ultrasound of the breasts and axilla, and a tissue biopsy has been taken from the tumour. The tumour is reported to measure a good 5 cm. In addition, the axillary lymph nodes have a pathological appearance. You know this patient is to be assessed for chemotherapy before surgery. Which investigations should you suggest?

- A You contact the oncologist and suggest referring the patient for PET CT of the head, spine, thorax, abdomen and pelvis to detect metastases. Incorrect answer. The first part is correct but PET CT is not used for investigation of metastases in breast cancer.
- B You contact the oncologist and suggest referring the patient for X-ray of the lungs and ultrasound of the liver to detect metastases. Incorrect answer. The first part is correct, but X-ray of the lungs or ultrasound of the liver are not
- useful in regard to detecting remote metastases.
   C X You contact the oncologist and suggest referring the patient for CT of the spine/thorax/abdomen and pelvis, as well as bone scintigraphy to detect metastases.
   Correct answer. This is current practice and is considered to be the best method for detecting metastases in breast cancer. Metastases detection is only performed in cases of locally advanced disease where there is a risk of remote metastases.
- **D** You contact the oncologist and suggest referring the patient for CT of the spine/thorax/abdomen/ pelvis to detect metastases. The answer is almost correct, but not completely. The CT investigation does not cover the skeleton sufficiently well in regard to metastases.

# 86

Bente (36 years old) has macroscopic haematuria and flank pain/discomfort on the left side. During investigation of haematuria, a 3-phase CT is performed comprising a precontrast phase, parenchymal phase and excretory phase.

Which conditions that cause haematuria are best diagnosed in the pre-contrast phase?

# A Infection

B X Concrement

CT pre-contrast offers high sensitivity for demonstrating concrements because the calcification will give high attenuation. Small endophytic tumours and urothelial cancers are more difficult to detect, as are infections in the form of mild pyelonephritis and abscesses which do not give particularly indirect signs of infectijon.

- C Urothelial tumour
- **D** Tumour in the renal parenchyma

# 87

A premature baby boy born in week 28 has problems breathing. Because of his prematurity, RDS (respiratory distress syndrome) is suspected. This is also called hyaline membrane disease or surfactant deficiency.

# What would be the typical appearance of an X-ray of the thorax?

- A Prominent and marked bronchovascular structures
- B Normal air-containing spaces in both lungs, sharp cardiac and diaphragm contours
- **C** Coarse reticular lung densities (paving stone pattern) in both lungs
- **D X** Somewhat grey lungs bilaterally, with general fine granular pulmonary densities *Fine granular lung densities bilaterally are typical for RDS in premature babies*

Lars (36 years old) has been diagnosed with proteinuria and haematuria. In addition, his face and legs are swollen. Clinical results indicate a glomerulonephritis. How is this diagnosis confirmed using imaging techniques?

- Diffusion restriction with diffusion MRI Α
- A Diffusion restriction with diffusion MRI
   B X Imaging techniques are not useful. Imaging techniques are not useful; only renal biopsy can confirm the diagnosis. Occasionally increased echo' is seen in renal failure due to GN but is non-specific. FDG PET-CT and MRI are not used. Moreover, FDG is excreted in the kidneys which would perhaps swamp any weak uptake in the renal parenchyma (imagined situation).
   C High uptake with PET (FDG)
   Decreased echogenicity with ultrasound
- Ď Increased echogenicity with ultrasound

#### 89



Case courtesy of A.Prof Frank Gaillard, Radiopaedia.org, rID: 6351

A newborn baby became rapidly cyanotic with severely laboured respiration. First an X-ray was taken and, based on this, treatment was initiated. Later, an X-ray of the thorax abdomen was taken, see attached image.

Which is the most probable condition based on the X-ray of the thorax and abomen?

A Bronchopulmonary dysplasia

The absence of an intraabdominally located small intestine, very blurred medial border of the left diaphragm supports a diaphragmatic hernia. Bronchopulmonary dysplasia affects both lungs, and displacement of the heart to the right is rarely seen.

**B** X Diaphragmatic hernia The X-ray reveals that the left hemithorax is filled with multiple low density areas, and the heart is displaced towards the right. The multiple low density areas represent the small intestines. One would expect to see some signs of air-containing intestines in the abdomen, which however are not observed. Do not be fooled by the nasogastric tube which passes down into the abdomen because the stomach lies here, while the rest of the intestines have herniated to the left hemithorax.

https://radiopaedia.org/cases/congenital-diaphragmatic-hernia https://www.uptodate.com/contents/congenital-diaphragmatic-hernia-in-the-neonate?source= search\_result&search=congenital%20diaphragmatic%20hernia&selectedTitle=2~44

- **C** Transient tachypnea of the newborn This is a benign condition with normal lung parenchyma that is characterised by interstital oedema and interlobular septal thickening. Moreover, the condition affects both lungs.
- D Meconium aspiration Characterised by diffuse patchy densities bilaterally and hyperinflated lungs, which we do not see here. Displacement of the heart to the right hemithorax also suggests it is not meconium aspiration. Absence of an intra-abdominally located small intestine with findings of intestine-like structures in the left hemithorax support a diaphragmatic hernia.

90



Case courtesy of Dr Chris O'Donnell, Radiopaedia.org, rlD: 16638

A 65-year old man comes to A&E with strong colic pain in his left flank radiating to the groin. You take a quick presenting history and find out that he has known primary hyperparathyroidism, and has had problems with recurring urinary tract stones. The pain started 3 hours ago, and his general health is poor. You then quickly assess his vital signs and find a pulse of 108, BP 95/70, respiration rate 22, temperature 39.0. The on-call radiologist performs an ultrasound of the left kidney, see the attached image.

## How should this patient be treated?

Ureterorenoscopy with stone crushing must be performed and antibiotic treatment started with Α cloxacillin + gentamicin i.v.

Urosepsis with hydronephrosis must be managed by an urgent nephrostomy and treated with ampicillin + gentamicin i.v.

**BX** A nephrostomy should be performed and the patient started on antibiotics with ampicillin and gentamicin i.v.

The patient meets the SIRS criteria and, based on the medical history, urosepsis is strongly indicated. Ultrasound of the right kidney reveals pronounced hydronephrosis with thinning of the cortex and dilated ureter. The combination of hydronephrosis, stones and probably urosepsis indicate the need for an urgent nephrostomy.

http://sites.helsedirektoratet.no/sites/antibiotikabruk-i-sykehus/terapikapitler/sepsis/Sider/default. aspx

https://sml.snl.no/nyrestein

- C ESWL shold be performed and antibiotic treatment started with ciprofloxacin + gentamicin i.v. Urosepsis with hydronephrosis must be managed by an urgent nephrostomy and treated with ampicillin + gentamicin i.v.
- D A JJ stent should be inserted and antibiotic treatment started with cefotaxim + gentamicin i.v. Urosepsis with hydronephrosis must be managed by an urgent nephrostomy and treated with ampicillin + gentamicin i.v.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3577588/

91

Premature babies born before week 32 are routinely examined using ultrasound of the head after the birth

#### What does one primarily want to exclude/demonstrate and for which ultrasound is very suitable?

# **AX** Brain haemorrhage

Premature babies are particularly prone to bleeding in the germinal matrix, because the blood vessels here are highly sensitive to hypoxia and increased blood pressure. Bleeding here can cause development of CP, but this is an umbrella term for disorders of muscle function and cannot be demonstrated using ultrasound. Hydrocephalus is never screened for postnatally, it is generally demonstrated at prenatal US. HIE is a clinical entity after asphyxia.

- Hypoxic-ischemic encephalopathy В
- Hvdrocephalus С
- D Cerebral paresis

92

Bente (36 years old) has macroscopic haematuria and flank pain/discomfort on the left side. During investigations for haematuria, a 3-phase CT is performed comprised of a precontrast phase, parenchymal phase and excretory phase. Which conditions that cause haematuria are best diagnosed in the parenchymal phasen?

- **AX** Tumour in the renal parenchyma A tumour in the renal parenchyma will take up contrast that is best detected in the parenchymal phase. It is possible to see stones, but very small concrements can drown in both the parenchymal and excretory phases. Urothelial tumours are not necessarily obvious in the parenchymal phase and can easily be overlooked when they are small. Glomerulonephilis is often not seen with CT but is a histological diagnosis.
- Urothelial tumour B
- Concrement С
- D Nephritis

A 4-year old boy has been diagnosed with a nephroblastoma (Wilm's tumour) originating in the right kidney. Before starting treatment with chemotherapy and surgery, the paediatrician must investigte the scope of the disease (stage). Supplementary CT of the thorax and abdomen is ordered. We assume that the effective child dose for a CT thorax is 3 mSv and for a CT abdomen 4 mSv. What is the radiation exposure time period that is equivalent to background radiation in Norway?

- A 1.5 months
- **B** 15 years **C** 1.5 days
- **C** 1.5 days **D X** 1.5 years

The annual background radiation is about 5 mSv

#### 94

Metastases from prostate cancer can spread hematogenously. Which imaging modality is the most important for demonstrating this?

- A Scintigraphy
- Detects bone metastases, but is not as sensitive as MRI.
- B CT Can detect bone metastases, but is not as sensitive as MRI
- C X MRI Has the best sensitivity for bone metastases
- PET-CT with FDG
   The prostate and most tumours in the prostate have very low glucose metabolism and therefore do not take up FDG, which is a glucose analogue

95



#### Case courtesy of Radiopaedia.org, rID: 11675

You are doing foundation training at a small district hospital and you are on duty when a 2-year old boy arrives with his father. The boy is listless and inactive, and you get the impression that he has severe pain in his right hemithorax; he also points vaguely to his navel. The boy has previously been healthy and both the pregnancy and birth were normal. He is allergic to penicillin, citrus frutis and egg. You try to conduct a clinical examination of the boy who gives very poor contact and does not cooperate well. The father tries to reassure him, but the boy responds poorly. As part of investigations, an X-ray of the thorax is taken, see the attached image **How do you further manage this boy?** 

## How do you further manage this boy?

**A X** You admit the boy to the Paediatric Dept, contact the Specialist Registrar and notify the Child Welfare Services.

Multiple posterior costal fractures with varying appearance are highly indicative of abuse. The boy gives very poor contact and cooperates poorly during the examination and does not repsond well to the father's attempts to reassure him which also support this suspicion. If abuse is suspected, a doctor should not act alone in these matters and the Speciaist Registrar or other personnel should be quickly contacted. if there is reason to believe that the child has been abused at home or there are other forms of neglect, healthcare personnel are obligated on their own initiative to notify the Child Welfare Services.

http://www.helsebiblioteket.no/retningslinjer/akuttveileder-i-pediatri/sosialpediatri/generelleretningslinjer

http://www.helsebiblioteket.no/retningslinjer/akuttveileder-i-pediatri/sosialpediatri/fysiskmishandling

**B** You order extensive biochemical investigation including ionised Ca, albumin, phosphates, ALP, s-PTH, 25OH-Vit D, and ceruloplasmin, and refer the boy to the Paediatric Medical Outpatients Clinic.

The medical history and findings from radiology are strongly indicative of abuse; the boy should therefore be admitted for further investigations and not sent home with an Outpatient Clinic appointment.

- C You order extensive biochemical investigations including CRP, SR, IgA, IgM, IgG, IgE, specific IgE against citrus, nuts, birch and other known allergens and then refer the boy to the Paedatric Medical Outpatient Clinic. The medical history and findings from radiology are strongly indicative of abuse; the boy should therefore be admitted for further investigations and not sent home with an Outpatient Clinic appointment.
- **D** You admit the child to the Paediatric Dept. and start treatment with i.v. erythromycin. The boy is, correctly, allergic to penicillin, but there is nothing on the X-ray of the thorax that indicates a lung condition. However, the multiple posterior costal fractures combined with a medical history are strongly indicative of abuse.

96

The images present sections from the adrenals (hematoxylin, eosin and saffron (HES) staining, x100 and x400 magnification).

Which condition is most compatible with the findings in the images?



- Adrenal with acute adrenal failure triggered by sudden discontinuation of treatment with Α corticosteroids.
- **B** X Adrenal with acute adrenal failure as part of DIC (disseminated intravascula coagulopathy): Waterhouse-Friderichsen syndrome. The image shows an adrenal with extensive fresh bleeding which has occurred as part of DIC (disseminated intravascular coagulopathy) in connection with sepsis.
- С Adrenal with chronic adrenal failure: Addison's disease.

A 50-year old woman felt a lump in her right breast. A biopsy was taken and fluorescence in situ hybridisation (FISH) was performed to investigate the HER2 gene, as shown on the image below. The HER2 gene is labelled with red fluorescence and the chromosome 17 centromere is labelled with green fluorescence. Based on the image and what you know about HER2, which statement is correct?



- The image shows that the HER2 protein is overexpressed in the tumour cells Δ
- В The image shows that there are repeated mutations in the HER2 gene
- HER2 protein overexpression is most often due to a point mutation С The image shows that the HER2 gene is amplified in the tumour cells HER2 protein expression can be investigated using immunohistochemistry. Overexpression of the DΧ HER2 protein is generally due to amplification of the HER2 gene.

Tumours in the ovaries originate in different types of tissue and, of the malignant tumours, serous cystadenocarcinomas are the most frequent. In which type of cells do these tumours originate?

- A Sex-coru suon B X Epithelial cells Sex-cord stromal cells

Teratomas, embryonal carcinomas and endodermal sinus tumours (yolk sac tumours) are tumours that originate in the germ cells. Sex-cord stromal tumours originate in the support cells around the egg itself, e.g. granulosa cells and theca cells. Cystadenocarcinomas are epithelial tumours and therefore originate in the epithelium either on the surface of the ovary or in the tube epithelium.

- С Germ cells
- D Connective tissue cells

# 99

A 24-year old woman has a 5 cm diameter tumour in her right breast. This is removed surgically and the image shows a hematoxylin-erythrosin-saffron (HES) stained histology section from the tumour (x400).



Which diagnosis is the most compatible with the findings in the image?

- A Infiltrating carcinoma Incorrect answer. The image shows a well-demarcated tumour composed of stromal cells and ductular structures. There is no proliferation of atypical cells.
- B X Fibroadenoma This is the correct answer. A fibroadenoma is a well-demarcated benign tumour composed of a stromal component and an epithelial component. The stromal component is dominant.
   C Ductal carcinoma in situ (DCIS)
- Incorrect answer. The image shows a well-demarcated tumour composed of stromal cells and ductular structures.
- D Lobular carcinoma in situ (LCIS) Incorrect answer. The image shows a well-demarcated tumour composed of stromal cells and ductular structures. There is no proliferation of atypical cells in the glandular sections.

#### 100

A 62-year old man who has previously undergone surgery for bladder cancer, has a cystoscopy in connection with his cancer check-up. Cells from the irrigation fluid from the bladder cystoscopy are examined using fluorescence in situ hybridisation (FISH) with probes for chromosome 17, chromosome 3, chromosome 7 and locus 9p21. The image shows two cell nuclei from the sample after hybridisation with the four probes.



## Which answer is most compatible with the findings in the image?

- **A X** Change in the number of copies, compatible with recurrence of urothelial carcinoma *Correct answer. There are more than two copies of all three chromosomes, compatible with recurrence of his bladder cancer.*
- B Inflammatory cells, compatible with cystitis In cystitis we can see reactive urothelial cells and leukocytes. Both will only have two copies of the three chromosomes and locus 9p21.
- C Normal urothelial cells Incorrect answer. Normal urothelial cells will only have two copies of the three chromosomes and locus 9p21.
- **D** Reactive changes in the urothelial cells, compatible with effect of treatment *Reactive urothelial cells will only have two copies of the three chromosomes and locus 9p21.*

#### 101

Around 300 new cases of testicular cancer are diagnosed every year in Norway, and about 50% of the patients are younger than 32. Almost 95% of the cases can be classified as seminomas or non-seminomas. The image shows a hematoxylin-erythrosin-saffron (HES) stained histology section from a testicular tumour (x400).



# Which diagnosis is most compatible with the findings in the image?

- A Choriocarcinoma Incorrect answer. Here we see immature germ cells, lymphocytes and fibrous bands compatible with seminoma
- **B X** Seminoma Correct answer. Here we see immature germ cells, lymphocytes and fibrous bands compatible with seminoma
- **C** Teratoma Incorrect answer. Here we see immature germ cells, lymphocytes and fibrous bands compatible with seminoma
- **D** Chronic inflammation Incorrect answer. The lymphocytes seen here are not an expression of chronic inflammation.

## 102

As a foundation doctor at a hospital you see a 2-year old child who is admitted after having been diagnosed with a tumour in one of his kidneys.

What would you consider to be the most probable type of tumour?

#### **AX** Nephroblastoma

Of the kidney tumours, nephroblastoma (Wilm's tumour) is the most common in children. Sacrococcygeal teratoma is localised in the os coccygis, neuroblastomas normally arise in the adrenals, and embryonal carcinoma is a germ cell tumour that normally originates in the gonads, but can be localised in other areas.

- B Embryonal carcinoma
- **C** Sacrococcygeal teratoma
- D Neuroblastoma

#### 103

A woman in her 30s has had increased urge to urinate and dysuria over the last 3-4 days. Clinical examination revealed no flank pain or tenderness. Urine analysis did not demonstrate glucose, protein or blood, but was nitrite positive with numerous leukocytes. Serum creatinine was normal. Which of the following diagnoses is the most probable?

- A IgA nephropathy
- B Kidney stones
- **C** Interstitial cystitis
- **DX** Acute cystitis

Typical history of illness with acute onset of symptoms and findings as well as positive dipstick.

#### 104

A 43 year old man is admitted with a serious infection. Investigations reveal a positive HIV test, and his condition is eventually classified as AIDS. Microscopy of an India ink specimen of spinal fluid (1000x magnification) reveals large round cells with very large capsule (see image below). Antigen test of the spinal fluid for the agent in question is also positive. Which microbiological agent is this?



- A Haemophilus influenzae
- *Rod bacteria***B** Neisseria meningitidis
- Bean-shaped diplococci
- C Herpes simplex virus
- Too small to be seen at light microsopy
   D X Cryptococcus neoformans There is an increased risk of cryptococcal meningitis with AIDS, India ink specimens are used to demonstrate the large capsule; antigen test is more sensitive than microscopy.

Which species of fungus is the most common cause of invasive fungal infections in Norway?

- A Histoplasma capsulatum
- Causes systemic mycosis, but is no longer to be found in Norway Trichophyton rubrum Dermatophyte, does not cause invasive disease
- C Cryptococcus neoformans Causes invasive fungal infections, but not common
   D Aspergillus fumigatus The most common cause of invasive fungal infections, but rarer than Candida.
- The most common cause of invasive fungal infections, but rarer than Candida infections **E X** Candida albicans

# 106

A man who has just returend from a hunting safari in South Africa comes to your office with a fever (39.5 degrees) and headache. He has some swollen lymph nodes in the neck and a general maculopapulous rash. You find some black crusts (scabs) on both legs with a red ring round. The patient believes these are from tic bites when he was on safari. What is the most probable diagnosis?

# A Malaria

- **B** Ring worm (fungal infection)
- C Dengue fever
- DX Rickettsiosis

Rickettsia africae which gives rickettsiosis is transferred by tic bites particularly in tourists who are on safari and/or hunting. The tic bite is characterised by black crusts and surrounding red ring (eschar). There has been a particularly large numbe of cases in Norway in tourists who have been in South Africa.

A woman who is pregnant in the first trimester comes to your surgery and says she has to urinate frequently and it burns when she urinates. Urine dipstick reveals pyuria. You interpret this as a urinary tract infection and decide to start her on a course of antibotics. Which antibiotic should you choose?

- Ciprofloxacin (Ciproxin) tablets
- Trimethoprim/sulfamethoxazole (Bactrim) tablets В
- Amoxicillin (Imacillin) tablets С
- **D X** Mecillinam (Selexid) tablets Selexid is the first-choice drug for treatment of UVI in pregnant women. Ciproxin is contraindicated throughout pregnancy; Bactrim in the 1st and 3rd trimester. Imicillin must not be used as empirical treatment due to the high resistance to this drug.

## 108

You are working as the District Medical Officer and want to try to limit the number of new HIV cases in the municipality through an information campaign.

Which risk groups should you preferably direct your campaign at as most of the new cases will occur in these groups?

- Female prostitutes and immigrants from Asia Α
- В Men who have sex with men and drug addicts who inject
- С People with a compromised immune system and drug addicts who inject

**D** X Men who have sex with men and immigrants from Africa The latest reports from the Public Health Institute reveal that men who have sex with men and immigrants (particularly from Africa) clearly comprise the largest at-risk group for HIV

#### 109

A patient who has a severely suppressed immune system with high dose corticosteroids is admitted with breathing problems and fever. X-ray of the thorax reveals no infiltrates. Which investigation should you do next?

- **AX** High resolution CT (HRCT) of the thorax to detect a lung infection X-ray of the thorax has a sensitivity of <50% for detecting opportunistic lung infections in people whose immune systems are heavily suppressed. HRCT of the thorax is thus recommended as this investigation has a negative predictive value above 90% CT of the pulmonary arteries to detect a pulmonary embolism
- В
- С US urinary tract to detect a urinary tract infection
- CT head to detect a brain abscess D

#### 110

When kidney function is impaired a number of analgesics must be used with particular care. The dose must often be reduced, and dose escalation must be done with care. However, this is not the case for the widely used analgesic paracetamol. Why not?

Α Because the therapeutic window of paracetamol is so wide that dose adjustments are not necessary

This is not correct - paracetamol does not have a wide therapeutic window; there is little difference between therapeutic doses and toxic doses.

- B Because a variable and significant part of an administered dose of paracetamol is excreted via the kidneys No
- C Because the toxic metabolite NAPQI is produced in low and non-dangerous concentrations in impaired renal function
- NAPQI production is independent of renal function
- **D X** Because paracetamol is almost exclusively conjugated to inactive metabolites in the liver *Correct answer. Paracetamol is bound to glucuronic acid or sulphate, which inactivates the* compound. Very little paracetamol is excreted in an unchanged/inactive form via the kidneys.

Therapy options in hyperthyroidism include antithyroid drugs, radioactive idoine therapy and surgery. Which other drug group is often used in the symptomatic treatment of hyperthyroidism?

- A X Non-selective beta-blockers Correct answer. Are effective on sympathetic nervous system-dependent symptoms of hyperthyroidism.
   B Alpha-blockers
- C Combined alpha- and beta-blockers
- D Selective beta-blockers
  - Are not effective on the symptoms of hyperthyroidism such as tremors which are due to stimulation of beta-2 receptors.

## 112

One clinically important difference between angiotensin receptor blockers and ACE inhibitors is that the angiotensin receptor blockers have a lower risk of dry cough and angioneurotic oedema. This is linked to the biological effects of bradykinin. **What mechanism is involved?** 

- A Angiotensin receptor blockers inhibit bradykinin by blocking bradykinin receptors
- BX ACE inhibitors inhibit breakdown of bradykinin via ACE
- It is well established that ACE, in addition to converting angiotensin I to angiotensin II, is also important in breakdown of bradykinin to inactive metabolites. The characteristic dry cough experienced by many patients as a side effect of ACE inhibitors is considered to be caused by bronchoconstriction resulting from bradykinin accumulation in lung tissue. Similarly, ACE inhibitortriggered angioneurotic oedema is considered to be related to accumulation of bradykinin in the tissues. Vascular dilation and oedema formation, probably also mediated via affects on other mediators, is a known biological effect of bradykinin.
- **C** ACE inhibitors increase synthesis of bradykinin
- **D** ACE inhibitors increase activation of bradykinin in plasma

# 113

A 27-year old woman with epilepsy has an appointment with her treating neurologist and says that she is pregnant. Her last period was 7 weeks ago. She takes levetiracetam and lamotrigin and has had no episodes with seizures for several years. Repeated serum concentration measurements over the last few years have shown levels of both drugs in the middle of the reference range. The neurologist orders new blood tests which reveal levels of both levetiracetam and lamotrigin about 40% lower than previous measurements. The neurologist knows the patient to be very conscientious and has all reason to believe that she takes her medicines regularly, which she also confirms when asked about this.

#### What is the most probable explanation of the drop in serum concentration?

- A Decreased absorption due to reduced gastrointestinal motility No. The absorbtion is, correctly, somewhat slower than in the non-pregnant state but the bioavailability s nonetheless almost as high, i.e. the area below the concentration-time curve and the drug-fasting serum concentration are almost unchanged, even though the curve appears to be flatter.
- B Increased volume of distribution via an increase in body fat No, this effect alone will not cause such a large drop in serum concentration, particularly because it is so early in the pregnancy when not so much fat has yet been laid down. Also applies for highly lipophilic drugs which neither lamotrigin nor levetiracetam are known to be.
- **C X** Increased elimination of drugs via the kidneys This is the most probable explanation because the glomerulær filtration rate increases by up to 80% as early as 2 weeks after conception
- D Dilution effect due to fluid retention in the body (increased "total body water") No, this effect alone will not cause such a large drop in serum concentration, particularly because it is so early in the pregnancy when the fluid volume in the body has not yet increased that much.

A number of drugs can increase the QT interval on ECG and trigger a special form of ventricular tachycardia, torsades de pointes. This arrhythmia can progress to ventricular fibrillation and result in death.

## Which of the antibiotics below are associated with this adverse effect?

AX Erythromycin

Erythromycin is associated with prolongation of the QT interval and occasional instances of arrhythmia. Cases of torsades de pointes and deaths have been reported. None of the other answers are particularly associated with a long QT interval as an adverse effect.

- B Phenoxymethylpenicillin
- **C** Gentamicin
- D Dicloxacillin

## 115

You are the GP for a 57-year old man who has recently been investigated for high blood pressure. You have diagnosed moderate essential hypertension and, based on his total cardiovascular risk profile, have found indication for antihypertensive treatment. He is otherwise quite healthy, but has Raynaud's syndrome, an idiopathic condition with episodic painful circulatory failure in the fingers and toes, which can be quite troublesome. It is now time to choose the antihypertensive drug.

Of the various categories of blood pressure-lowering drugs, one type could be particularly useful for this patient, which one?

- A Beta-blockers (e.g. metoprolol)
- **B X** Calcium blockers (e.g. nifedipine) *Effective against Raynaud's disease, dilates peripheral blood vessels. Supplementary indication.*
- **C** Thiazide diuretics (e.g. hydrochlorthiazide)
- **D** ACE inhibitors (e.g. lisinopril)

#### 116

С

Morphine is commonly a first-choice treatment for patients with opioid-requiring acute pain. However, in patients with renal failure, use of morphine can pose problems. Which of the following alternatives would be the best in this case?

 A Refrain from giving opioid analgetics Not giving opioids to patients with strong acute pain that is not sufficiently alleviated with weaker analgesics must be considered to be a professional failure.
 B Pethidine

Pethidine Pethidine is converted to both active and inactive metabolites that are primarily excreted via the kidneys. Long-term use or impaired renal function can result in accumulation of the active and neurotoxic metabolite norpethidine which has a long half-life.

Codeine At therapeutic doses, codeine must be converted to morphine to have an analgesic effect. This conversion is subject to much genetic variation giving an unpredictable effect and side effect risks depending on the amount of morphine that is formed. In practice, this is therefore a more uncontrolled/unpredictable way of giving morphine. Accumulation of morphine-6-glucuronide in impaired renal function can have serious side effects also when using codeine.

**DX** Oxycodone

Oxycodone is primarily converted to inactive metabolites. The metabolites and some unconverted oxycodone are excreted primarily via the urine, and the half-life increases with impaired renal function. However, oxcycodone is accumulated less than morphine in impaired renal function. Even though oxycodone is less affected by renal function than morphine it shoud be used with care, and renal function should be taken into account when deciding the dose.

D

You are the GP for a man in his 60s who 2 weeks ago made an appointment and wanted a "health check". He had noticed that he got tired more quickly and had pain in his legs when out walking, otherwise he felt healthy. He takes no medicines and has no known allergies. He smokes 15 cigarettes a day, as he has done for the last 35 years.

Standard physical clinical examination revealed no pathological findings. Blood pressure was measured at 168/107, and ankle-arm index at 0.7. ECG revealed left ventricular hypertrophy, evaluated using the Sokolow-Lyon criteria. Urine dipstick showed proteinuria 2+. You gave the patient detailed lifestyle advice.

Blood pressure was re-measured 3 days later at 166/108. At today's consultation you measure his blood pressure again and find 172/109. You also have the results of the blood tests you ordered. You decide that the patient's blood pressure should be treated.

Analysis	Value	Reference range
Na	142 mmol/L	137 – 145 mmol/L
К	3.4 mmol/L	3.3 – 4.4 mmol/L
Hb	15.2 g/dl	13.2 – 17.3 g/dl
pro-BNP	5 pmol/L	<15 pmol/L
Fasting p-glucose	6.4	4.2 – 6.3 mmol/L
HbA1c	46 mmol/mol (6.4%)	28 – 40 mmol/mol (4.7 – 5.8%)
Uric acid	510 micromol/L	230 – 480 micromol/L
Triglycerides	2.50 mmol/L	0.45 - 2.60 mmol/L
LDL	6.2 mmol/L	2.0 – 5.3 mmol/L
HDL	0.7 mmol/L	0.8 – 2.1 mmol/L
Total cholesterol	6.9 mmol/L	3.9 – 7.8 mmol/L
eGFR	85 ml/min	>90 ml/min

Which antihypertensive drugs are the most appropriate for this patient?

**A X** ACE inhibitor and calcium antagonist

- B ACE inhibitor and thiazide Thiazide is incorrect, see previous answer.
   C Calcium antagonist and thiazide Thiazides are often beneficial in older poeple, because they often have a salt-sensitive hypertension. However, this patient has high levels of uric acid, and uric acid excretion will drop when using thiazides. This will confer a risk of painful gout which constitutes unnecessary suffering for him, and will increase the chances of future non-compliance in regard to his medication. Other factors that can be taken into account are a low potassium level, HbA1c just on
  - the limit for diabetes and an unfavourable lipid profile. Overall, thiazides should therefore be avoided in this patient. http://legemiddelhandboka.no/Generelle/60904 ACE inhibitor and beta-blocker Beta-blockers will probably exacerbate the patient's claudication as these drugs cause peripheral

vasoconstriction. Moreover, our patient will be exposed to other side effects of beta-blockers including erectile dysfunction and the unfavourable metabolic effects on glucose and lipid metabolism. If the patient had had heart failure, the situation would have been different, but with such low proBNP values together with his clinical status, caridac failure is highly improbable. http://legemiddelhandboka.no/Legemidler/61515/?ids=61516#i61516

ACE inhibitors are beneficial in reducing the patient's proteinuria, and would therefore have a renal protective effect. ACE inhibitors are also beneficial in reducing pathologic remodelling of the myocardium, a process which according to the ECG is already underway. The calcium anatagonist will be beneficial in reducing the symptoms of the patient's Intermittent claudication. This will increase his quality of life and make it easier to contnue with an active, healthy lifestyle. http://legemiddelhandboka.no/Legemidler/62503/?ids=62504#i62504

You diagnose hypertension in a patient, and consider starting drug therapy. Some drugs can cause hypertension as an adverse effect.

#### Which drug group is particularly associated with this effect?

- A Opioid analgesics
- B Aminoglycosides
- C X NSAIDS

NSAIDs increase the plasma volume and vascular resistance by reducing prostaglandin synthesis in certain vascular areas.

**D** Dopaminergic antiparkinson agents

#### 119

Biological availability or bioavailability is a central pharmacological variable that determines for example whether a drug can be given orally. **What is the definition of this term?** 

- **A** The fraction of an an ingested dose of the active substance that passes unmetabolised through the portal vein.
- **B** The fraction of an an ingested dose of the active substance that is absorbed from the intestines.
- **C X** The fraction of an an ingested dose of the active substance that appears in the systemic circulation.

Correct answer. Bioavailability depends on several factors - breakdown in the gastric acid, incomplete absorption, breakdown by enzymes in the intestinal mucous membrane and breakdown in first pass metabolism.

**D** The fraction of an an ingested dose of the active substance that is not bound to albumin or other plasma proteins.

Testen har 119 oppgaver. På utskriftstidspunktet var 0 oppgaver blitt trukket og det var gjort fasitendringer på 0 oppgaver.