

Federal State Budgetary Educational Institution of Higher Education  
"Privolzhsky Research Medical University"  
Ministry of Health of the Russian Federation

**BANK OF ASSESSMENT TOOLS FOR DISCIPLINE/PRACTICE**

**NEUROLOGY**

Training program (specialty): **31.05.01 GENERAL MEDICINE**

Department: **NERVOUS DISEASES**

Mode of study **FULL-TIME**

Nizhniy Novgorod  
202\_

## 1. Bank of assessment tools for the current monitoring of academic performance, mid-term assessment of students in the discipline / practice

This Bank of Assessment Tools (BAT) for the discipline "Neurology" is an integral appendix to the working program of the discipline "Neurology". All the details of the approval submitted in the WPD for this discipline apply to this BAT.

*(Banks of assessment tools allow us to evaluate the achievement of the planned results stated in the educational program.*

*Assessment tools are a bank of control tasks, as well as a description of forms and procedures designed to determine the quality of mastering study material by students.)*

## 2. List of assessment tools

The following assessment tools are used to determine the quality of mastering the academic material by students in the discipline/ practice:

No.	Assessment tool	Brief description of the assessment tool	Presentation of the assessment tool in the BAT
1	Situational tasks	A method of control that allows you to assess the criticality of thinking and the degree of the material comprehension, the ability to apply theoretical knowledge in practice.	List of tasks
2	Test	A system of standardized tasks that allows you to automate the procedure of measuring the level of knowledge and skills of a student	Bank of test tasks

*Approximate list of assessment tools (select the one you need)*

№	Name of assessment tool	Brief description of the assessment tool	Presentation of assessment tool in the bank
1	Test №1	A system of standardized tasks that allows you to automate the procedure of measuring the level of knowledge and skills of a student	Bank of test tasks
	Test №2		
3	Course work (project)	A tool of verifying the ability to present the results of theoretical, calculated, analytical, experimental studies	List of coursework topics (projects)
4	Business/role-playing game	Joint activity of a group of students and a teacher under the guidance of a teacher in order to solve educational and professionally-oriented tasks by game modeling of a real problem situation. It allows you to evaluate the ability to analyze and solve typical professional tasks	Topic (problem), concept, roles and expected outcome for each game
5	Case - task	A problem task in which the student is offered to comprehend a real professionally-oriented situation necessary to solve this problem.	Tasks for solving cases
6	Colloquium	A tool of controlling the mastering of study materials of a topic, section or sections of a discipline, organized as a class in the form of an interview between a teacher and students.	Questions on topics/sections of the discipline

<b>7</b>	Round table, discussion, controversy, debate	Assessment tools that allow students to be included in the process of discussing a controversial issue, problem and evaluate their ability to argue their own point of view	List of discussion topics for a round table, discussion, polemic, debate
<b>8</b>	Portfolio	A targeted selection of student's works, revealing his/her individual academic achievements in one or more academic disciplines	Portfolio structure
<b>9</b>	Project	The final product obtained as a result of planning and execution of a complex of educational and research tasks. It allows students to evaluate the ability to independently construct their knowledge in the process of solving practical tasks and problems, navigate the information space and the level of formation of analytical, research skills, practical and creative thinking skills. It can be performed individually or by a group of students	Topics of group and/or individual projects
<b>10</b>	Workbook	A didactic complex designed for independent work of the student and allowing to assess the level of mastering study materials	Workbook sample
<b>11</b>	Solving sets of tasks	The following tasks are distinguished : a) of reproductive level, allowing to evaluate and diagnose knowledge of factual material (basic concepts, algorithms, facts) and the ability to correctly use special terms and concepts, recognition of objects of study within a certain section of the discipline; b) of reconstructive level, allowing to evaluate and diagnose the ability to synthesize, analyze, summarize factual and theoretical material with the formulation of specific conclusions, the establishment of cause-and-effect relationships; c) of creative level, allowing to evaluate and diagnose skills, integrate knowledge of various fields, argue your own point of view	A set of multi-level tasks
<b>12</b>	Essay	A tool that allows you to evaluate the student's ability to state the essence of the problem in writing, independently analyze this problem using concepts and analytical tools of the relevant discipline, and draw conclusions summarizing the author's position on the problem.	The subject of the essay
<b>13</b>	Control work	A tool of checking the ability to apply acquired knowledge for solving problems of a certain type by topic or section	Set of control tasks in variants
<b>14</b>	Creative task	A partially regulated task that has a non-standard solution and allows you to diagnose skills, integrate knowledge of various fields, and argue own point of view. It can be performed individually or by a group of students.	Group topics and/or individual creative tasks

15	Abstract	The product of the student's independent work, which is a summary in writing of the results of the theoretical analysis of a certain scientific (educational and research) topic, where the author reveals the essence of the problem under study, provides various points of view, as well as his /her own views on it.	List of abstract topics
16	Terminological dictation	A knowledge testing tool that allows you to evaluate the theoretical training of a student.	List of terms
17	Individual survey	A control tool that allows you to assess the degree of comprehension of the material	List of questions
18	Interview	A tool of control organized as a special conversation between the teacher and the student on topics related to the discipline being studied, and designed to clarify the amount of knowledge of the student on a specific section, topic, problem, etc.	Questions on topics/sections of the discipline
19	Situational tasks	A method of control that allows you to assess the criticality of thinking and the degree of the material comprehension, the ability to apply theoretical knowledge in practice.	List of tasks
20	Report	The product of the student's independent work, which is a public presentation about the results obtained by solving a certain educational, practical, research or scientific topic	Topics of reports, presentations

**3. A list of competencies indicating the stages of their formation in the process of mastering the educational program and the types of evaluation tools**

Code and formulation of competence*	Stage of competence formation	Controlled sections of the discipline	Assessment tools
GPC-9 PC – 5 PC - 6	Current	Section: Motor system. Motor paralysis Section: Extrapyramidal system. Parkinsonian syndrome. Dyskinesias. Cerebellar anatomy. Cerebellar disorders symptoms Section: Sensory system Section: Cranial nerves Section: Autonomic nervous system Section: Higher mental functions. Gnosis, praxis, speech, consciousness Section: Topical diagnosis of brain and spinal cord injury Section: Ophthalmoscopy in neurology. Cerebrospinal fluid analysis. Instrumental methods in the diagnostic of neurological disorders.	Situational tasks, Test
UC-4 GPC-8 GPC-9 PC – 1	Current	Section: Ischemic stroke. Hemorrhagic stroke and subarachnoid hemorrhage. Section: Meningitis, encephalitis, brain abscess. Neurological complications of	Situational tasks, Test

PC – 5 PC – 6 PC – 8 PC – 10 PC – 11 PC – 14 PC - 16		HIV/AIDS Section: Multiple sclerosis. Section: Epilepsy. Migraine. Section: Tumors of the brain and spinal cord Section: Brain and spinal cord injuries. Section: Diseases of the peripheral nervous system. Section: Back pain. Section: Hereditary neuromuscular diseases. Myasthenia gravis Section: Disorders of consciousness. Fainting. Comas	
UC-4 GPC-8 GPC-9 PC – 1 PC – 5 PC – 6 PC – 8 PC – 10 PC – 11 PC – 14 PC - 16	Mid-term	All sections	Situational tasks, Test

#### 4. The content of the assessment tools of entry, current control

Current control is carried out by the discipline teacher when conducting classes in the form of: Task

Assessment tools for current control.

##### 4.1. Tasks for the assessment of competence "GPC-9":

###### Task

A 52 year- old man developed right arm, hand and leg weakness two hours prior to admission to the emergency department. At the time of examination, dysphasia was noted. Over the ensuing hour the patient became obtunded, areflexic on the right side, and completely unable to lift the right arm against gravity. The physical exam added no new information.

- What syndrome should be diagnosed?
- What structures are involved?
- Where is the focus of the lesion?

###### Task

A 65 year-old man complained of weakness in the right arm. For 3 months he had been dropping objects, and it was gradually getting worse. There were no sensory symptoms. On exam, the patient was mildly confused and speech was slow and slurred. The right nasolabial fold was flat. Muscle bulk was normal. No fasciculations were seen. Muscle tone was increased in the right extremities ("clasp-knife"). Strength was diminished in the right intrinsic hand muscles, the wrist dorsiflexors, triceps, deltoids, iliopsoas, hamstrings and tibialis anterior. A right pronator drift was observed. Finger movements were slow on the right. The right leg circumducted while walking. Reflexes were hyperactive on the right. The right plantar response was extensor. Sensation to touch, pin, cool, vibration was normal. Two-point discrimination, point localization and graphesthesia were poorly done on the right in comparison with the left.

- List features of the clinical upper motor neuron and low motor neuron syndromes.
- What are possible sites of a lesion in this case?
- Name possible causes of the disease in this patient

### **Task**

A 67 year old patient complains of general weakness, headache and weakness in the left arm. Objectively: range of active movements in the left arm is limited, upper Barre test is positive on the left side, a muscle tone is increased in the muscles- flexors of the left arm, tendon reflexes in the left side biceps and triceps muscles are higher than on the right side.

- Name the syndrome.
- Make a topical diagnosis.

### **Task**

A 10 year old female patient has the seizures in the left arm, that continue for 2-3 minutes without loss of consciousness. For the last 2-3 weeks the attacks have become more frequent and accompanied with the twitching in the left half of the face.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 38 year old patient complains of the gradually growing weakness in the left arm in the last few months. Objectively: hypotrophy of the hand muscles and forearm on the left side. Muscle strength in the fingers flexors is rated by 3/5 scores on the left side. Upper Barre test is positive on the left side. Tendon reflexes on the left side are less than on the right side. Fasciculations are present in the left forearm flexors.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 20 year old patient complains of the weakness and periodical disturbances of a micturition. Objectively: a muscle tone in the legs is increased. Muscles strength in the tight flexors is rated by 3/5 scores. Tendon reflexes in the legs are increased; clonus positive Babinski signs are present on the both sides. Superficial abdominal reflexes: high lines are intact, middle and lower are decreased.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 57 year old patient complains of the gradually growing weakness in the arms. In the last 2 month the weakness in the legs and disturbances of a micturition have been observed.

Objectively: muscles strength is rated by 3/5 scores in the arms and 4/5 scores in the legs. Hypotrophy of the muscles in the upper extremities and fasciculation in the shoulder muscles are present. A muscle tone is decreased in the arms and increased in the legs. Tendon reflexes in the arms are decreased and increased in the legs. Superficial abdominal reflexes are absent.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A patient complains of the weakness in the right leg while long walking.

Objectively: range of active and passive movements is not limited. Knee jerk reflex is decreased on the right side. Fasciculations are present in the right tight muscles.

- Identify the syndrome.
- *Make a topical diagnosis.*

**Task**

A patient complains of the staggering in the left side while walking, awkwardness in the left arm and leg, disturbances of the speech (words are fragmented into syllables). Objectively: ataxia in the left extremities, a decreased muscle tone in them, tilting to the left side in Romberg's test

- Identify the syndrome.
- Make a topical diagnosis.

**Task**

A 9 year old patient complains of the headache, staggering while walking, awkwardness in the extremities.

Objectively. Great amplitude nystagmus. Decreased muscle tone in the extremities on both sides. Instability in Romberg posture and while walking (staggering forward and backward). Ataxia in the lower and upper extremities.

- Identify the syndrome.
- Make a topical diagnosis.

**Task**

A 30 year old female patient applies to the ambulance with complaints of the sluggishness, disturbances while walking, general slowness of the movements, tremor in the arms on rest. Objectively: an increased muscle tone in the extremities on both sides, growing after the repetitive passive movements. Hypomimic face. Tremor at rest in the distal parts of extremities.

- Identify the syndrome.
- *Make a topical diagnosis.*

**Task**

A patient complains of the staggering in the left side while walking, awkwardness in the left arm and leg, disturbances of the speech (words are fragmented into syllables). Objectively: ataxia in the left extremities, a decreased muscle tone in them, tilting to the left side in Romberg's test

- Identify the syndrome.
- Make a topical diagnosis.

**Task**

A 9 year old patient complains of the headache, staggering while walking, awkwardness in the extremities.

Objectively. Great amplitude nystagmus. Decreased muscle tone in the extremities on both sides. Instability in Romberg posture and while walking (staggering forward and backward). Ataxia in the lower and upper extremities.

- Identify the syndrome.
- Make a topical diagnosis.

**Task**

A 30 year old female patient applies to the ambulance with complaints of the sluggishness, disturbances while walking, general slowness of the movements, tremor in the arms on rest. Objectively: an increased muscle tone in the extremities on both sides, growing after the repetitive passive movements. Hypomimic face. Tremor at rest in the distal parts of extremities.

- Identify the syndrome.
- Make a topical diagnosis.

**Task**

The parents of a 5 year old child began to observe awkwardness in his arms and instability while walking 3-4 months ago.

Objectively. Horizontal nystagmus while looking to both sides is present. Muscle tone is decreased, more in the right extremities. A finger-nose test is made with dysmetria and intentional tremor by the both arms. The patient deviates to the right while walking.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 40 year old female patient . The relatives begin to observe the behavioral disturbances. The patient became untidy and began to write worse. Objectively: repetitive, brief, irregular involuntary movements that involves the hands, feet, and face. The movements are not rhythmic and they seem to flow from one muscle to the next. The mouth and tongue continually move and the speech of the patient is not clear.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 16 year old female patient complains of the staggering while walking, awkwardness in the extremities (difficult to button up), disturbances of the handwriting. Objectively: horizontal nystagmus with more amplitude while looking to the right. Muscle tone in the right extremities is decreased. In Romberg test and while walking the right side staggering is observed .A finger-nose test is made with intentional tremor and missing a target. Ataxia in the heel- shin test is present. Dysdyadochokynesia and dysmetria on the right side are observed.

- Identify the syndrome.
- Make a topical diagnosis

### **Task**

A 55 year old right-handed man presented with a 4 hour history of weakness, tingling of the right hand and numbness of the right half of the mouth. Mild difficulty was experienced with word finding. Symptoms had improved since onset, but had not fully resolved. There was no significant past symptomatology.

Vital signs and general physical exam were normal. Mental status and speech were normal. Right nasolabial fold was flat relative to the left, but all other cranial nerve functions were intact. Subjective numbness was noted over the right distal hand, with errors exhibited in tests for two-point discrimination and graphesthesia. A mild right arm pronator drift and clumsiness of finger tapping in the right hand were observed. Reflexes were slightly more active on the right. The right toe was upgoing.

- What syndromes are revealed in the patient?
- Where is the likely focus of the lesion?

### **Task**

A 47 year-old right-handed man developed progressive numbness of feet over a 6 month period. Recently, his fingertips started feeling numb. He described an unpleasant burning sensation. Weakness was denied.

On exam, mentation and cranial nerves were normal. There were no palpably enlarged nerves, nor high arches. Position and vibration sense were grossly diminished in the feet. Cool stimuli and pin were perceived, but there was a subjective stocking distribution of numbness to mid-calf bilaterally. Reflexes were absent at the ankles and diminished elsewhere. Strength was close to normal, except that he could not walk on his heels.

- What type of sensory disorder is present?

### **Task**

A 42 year old patient had been losing the difference between the cold and warmth in the right arm and hand for the last 3 years. As an result, the patient got the burns of the arm and body many

times. Objectively: analgesia and thermoanalgesia in the right arm and in the right half of the body to the level of umbilicus are present. Tactile and deep sensation remain intact, the pain feeling is absent.

- Identify the syndrome.
- Make a topical diagnosis.

#### **Task**

In a 38 year old female patient a girdle pain appears on the level of the lower angle of the scapulae 2 years ago. At present the patient complains of the staggering while walking, especially during darkness. Objectively: decreasing of the proprioception in both legs is present.

- Identify the syndrome.
- Make a topical diagnosis.

#### **Task**

In a 14 year old patient the paralysis in the left extremities and a lost of deep sensation in the left half of the body and left extremities is observed. Objectively: plegia in the left extremities is present. Tendon reflexes on left side are higher than on the right side. Superficial abdominal reflexes are lost on the left side. The pain and temperature sensation are lost from the level of clavicle and below on the right side.

- Identify the syndrome.
- Make a topical diagnosis.

#### **Task**

A patient has been a heavy drinker for the last few years. He has begun to observe the pain and a decreasing of sensation in the arms and legs for the last 2-3 months.

Objectively: A decrease of all types of sensation in the arms and legs according to the type the “socks” and “gloves” is present. Ankle jerk reflexes are absent.

- Identify the syndrome.
- Make a topical diagnosis.

#### **Task**

A patient applies to the doctor with a complaint of the attacks of a decreasing sensation, with “creeping” feeling in the right hand, that last during 1-2 minutes. Between attacks the condition of the patient is satisfied. The sensation disorders are not detected by neurological examination.

- Identify the syndrome.
- Make a topical diagnosis.

#### **Task**

A 26 years old female patient applies to the doctor with a complaint of the decrease of the vision sharpness. Objectively: anosmia on the right side is present. Visual acuity is lost in the right eye. An atrophy of the optical nerve in the right eye and papilloedema in the left eye are detected by ophthalmoscopy.

- Identify the syndrome.
- Make a topical diagnosis.

#### **Task**

A 40 year old male patient applies to the doctor with a complaint of transient attacks of unpleasant smell feeling that last for 1-2 minutes. Objectively: left-side quadrant hemianopia is present.

- Make a topical diagnosis.

#### **Task**

A 26 year-old right-handed woman complained of headache and blurred vision for 6 weeks. There was no history of underlying disease nor head trauma. Fundi showed bilateral papilledema. Visual fields

were concentrically constricted and her blind spot was enlarged, but acuity was 20/20 (normal) in each eye.

- What is papilledema? What may mimic it?
- What is the differential diagnosis of this case?
- How would you proceed?

### **Task**

A 63 year-old man presented to the emergency room because he was unable to see objects to his left. This came to his attention when he was sideswiped by a garbage truck in cross-traffic. On examination he had a left homonymous hemianopsia. Saccades could be made in all directions but smooth eye movements were interrupted by frequent saccadic eye movements. The remaining neurological exam was negative.

- What is the course of fibers from retina to occipital lobe?
- What is the significance of:  
Homonymous hemianopia?  
Heteronymous hemianopia?  
Homonymous superior quadrantanopia?
- What is the significance of congruity in a field defect?
- What is the significance of the smooth pursuit defect in this case?

### **Task**

A 25 year-old woman suddenly notices that her left pupil is larger than her right (5 vs 3 mm).

- What is the pathway mediating the pupillary light reflex?
- What is the differential diagnosis of anisocoria?
- What is a "III-rd nerve palsy"? A "Homer's Syndrome"? What do each signify?

### **Task**

A 50 year old patient was hospitalized with complaints of shooting pains in the left part of his face. The attacks last from several seconds to several minutes. The attacks are provoked by chewing, talking, washing, cleaning teeth. On neurological examination no pathology was revealed.

- Make a diagnosis and prescribe treatment.

### **Task**

A patient complains of the double vision in the eyes, especially looking laterally. Objectively: the movements in the right eye are totally absent, the right upper eyelid is lowered, the right papilla is wider than the left one. There is loss of photoreaction, accommodation and convergence.

- Identify the syndrome.
- Make a topical diagnosis

### **Task**

A 62 year old patient went to a doctor with a complaint of the weakness in the right extremities and a double vision. Objectively: dropping eyelid is present on the left side. Widening of the left papillae, and a strabismus divergence on the left side. On the right side hemiplegia with high muscle tone and tendon reflexes and positive Babinski sign is present.

- Name the syndrome.
- Make a topical diagnosis

### **Task**

In a 65 year old female there was a sudden development of the palsy in the right extremities and a double vision. Objectively: strabismus convergence in the left eye is present. The movements of the left eye are limited laterally. Upper motor hemiparesis on the right side is detected.

- Identify the syndrome.
- Make a topical diagnosis

### **Task**

In a 48 year old male patient weakness and numbness in the right extremities appeared acutely after the physical overstrain. Objectively: the eyes are turned to the left side. The active movements are limited in the right extremities. The muscle strength is rated as 3/5 scores, the tendon reflexes are increased. Right side hemianesthesia is present.

- Identify the syndrome.
- Make a topical diagnosis

### **Task**

A patient has been suffering from a syringobulbomyelia . After the neurological examination the doctor noted the dissociated sensory loss (pain and temperature sensation lost, touch retained) in the lateral face area ("onion skin" pattern). In the central part of the face the sensation was intact.

- Make a topical diagnosis.

### **Task**

In a 55 year old female the acute attacks of the pain in the region of the left cheek with irradiation in the left ear appeared. The pain is short, shoots like very intensive, provoked by chewing, speech, swallowing, cooling. The drugs don't help in the moment of the attacks. Objectively: neurological deficit is not found.

- Identify the syndrome.
- Make a topical diagnosis

### **Task**

In a 16 year old male suddenly, after the cooling, the face distorted and taste became worse. Objectively: the loss of expression in right half of the face with an inability to close the eyes, to raise an eyebrow and to frown. There is also a decrease of lacrimation on the right side, increased sensitivity to sound in right ear, reduced sense of taste in two thirds of the right half of the tongue

- Identify the syndrome.
- Make a topical diagnosis

### **Task**

A 46 year old male patient applies to the doctor with complaint of the double vision in the eyes. Objectively : dropping eyelid and widening of the papillae are present on the left side. The left eye is turned outside and downwards.

Make a topical diagnosis

### **Task**

A 50 year-old woman complained of dizziness when turning over in bed. She was otherwise well and without antecedent illness or medical history of note. Exam demonstrated transient torsional-vertical nystagmus after the patient quickly moved her head back with the right ear down.

- Give a general approach to the "dizzy patient". Begin with likely causes of dizziness.
- When is dizziness "vertigo". What are some important etiologies of vertigo?
- What studies can be done to clarify the etiology of vertigo?

### **Task**

A 33 year-old woman slowly developed tinnitus and lost hearing in her left ear over a 2 year period. There were no other reported symptoms. Exam confirmed decreased acuity on the left, with air conduction greater than bone conduction bilaterally, and Weber lateralizing to the right ear. The left corneal reflex was diminished. A mild clumsiness and intention tremor was noted in the left hand.

- What is the differential diagnosis of hearing loss in one ear?
- What neural systems are impaired in this woman? What is the likely diagnosis?

**Task**

A female patient applies to the doctor with a complaint of the decreasing sharpness of the hearing and presence of the noise in the right ear and dizziness. Objectively: a decrease of sensation in the right half of the face is present. There is loss of the right corneal reflex, right side paralysis of the mimic face muscles, staggering to the right when standing in Romberg's posture and intentional tremor during a finger-to-nose test on the right side.

- Name the syndrome.
- Make a topical diagnosis.

**Task**

A 12 year old patient complains of the decreasing sharpness of the hearing and presence of the permanent noise in the left ear and transient dizziness that are accompanied by nausea and staggering while a walking. Objectively hypoakusia on the left side, nystagmus and staggering the left in Romberg's posture are present..

- Name the syndrome.
- Make a topical diagnosis.

**Task**

A 12 year old patient complains of the decreasing sharpness of the hearing and presence of the permanent noise in the left ear and transient dizziness that are accompanied by nausea and staggering while a walking. Objectively hypoakusia on the left side, nystagmus and staggering the left in Romberg's posture are present..

- Name the syndrome.
- Make a topical diagnosis.

**Task**

A 12 year old child has been suffering from diphtheria. On the 15-d day of the disease disturbances during swallowing, "nasal tone" and hoarseness of the voice appeared,. Objectively: excursion of the palatine during the phonation is limited, palatine and pharyngeal reflexes are lost, tachycardia is present.

- Diagnose the syndrome.
- Make a topical diagnosis.

**Task**

In a 43 year old patient the disorder of the swallowing, slurred speech and loss of sonority of voice appeared during the last 2 months. Objectively: palatal movement is absent on the right side, gag reflex is absent on the same side, dysphagia, dysphonia, dysarthria are present. The protruded tongue is deviated to the right side, a right half of the tongue is wasted and wrinkled.

- Diagnose the syndrome.
- Make a topical diagnosis.

**Task**

A male presents with fever, headache and neck and arm weakness. 2 weeks ago he worked in the forest and removed the tick from the neck. In 7 days flu-like symptoms developed and 8 days later the weakness occurred. Objectively: flaccid paresis of the neck extensors with his head hanging on his chest is present as well as the flaccid paresis of shoulder girdle muscles. The patient can not raise the arms above the horizontal line; the head hangs on the chest.

- Make a topical diagnosis.

**Task**

A 59 y/o right-handed man was brought to the emergency room because of sudden onset of disturbance of speech. On examination, he spoke spontaneously and excessively but conveyed little meaning. There are paraphrasias and neologisms. He could carry out only very simple instructions. Naming, repetition, and reading are impaired.

- 1/ Identify the syndrome
- 2/ Make a topical diagnosis
- 3 Describe Broca's vs. Wernicke's aphasia & usual lesion site.

### **Task**

A 50 year old patient was hospitalized to the emergency . At work he had a transient loss of consciousness

Objectively high arterial pressure was registered. The level of consciousness was normal. The comprehension of the addressed speech was intact and the patient carried out primitive instructions (such as “Shake the hand”). At the same time the patient couldn't not answer the questions and only pronounced the sounds “ yea-yea”.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 30 year old female patient has been suffering from a rheumatic heart valve defect . The relatives said that this disorder had an acute onset. Objectively: he didn't follow the instructions, couldn't not show the parts of his body by request and didn't differentiate the phonemes. The speech was fluid, but the words were not understandable. The speech was so disorganized that it made no linguistic or grammatical sense (“words salad”).

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A patient noted difficulties in reading, (forgot letters) and oral account. Objectively: he is not able to recognize objects by touch with his right arm. He laces up the shoes with difficulty, makes mistakes in counting, and forgets letters.

- Identify the defect of mental functions.
- Make a topical diagnosis

### **Task**

A female patient, a pianist, noted difficulties in playing in quick temp. At the same time the disturbances of the speech developed. Now she is not able to pronounce long words and makes mistakes in writing.

- Identify the movements and speech disorders

### **Task**

A 14 year old patient. The parents noted behavioral disturbances: foolishness, untidiness, a decrease of the memory. Objectively: the patient is disinhibited, doesn't follow the instructions quickly, repeats the words after the doctor, makes stereotypic movements.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

In a 59 old male patient speech disorders and weakness in the right extremities (more in the arm) developed suddenly. Objectively: the range of active movements is limited in the right extremities. Barre test is positive on the right side, more in the arm. The muscle tone is increased in the flexors muscles of the right arm and in the extensors muscles of the right leg. The tendon reflexes on the right side are increased. Babinski sign is positive on the right side. The motor aphasia is present.

1. Determine the syndrome
2. Make a topical diagnosis

### **Task**

A 30 year old female patient . Last year her behavior changed. The patient became untidy and tended to feeble jokes. Deterioration of vision developed. Objectively: there are left optic disc atrophy, papilledema in the right eye and left side anosmia. The speech of the patient is slow and inexpressive.

1. Diagnose the syndromes.
2. Make a topical diagnosis.

### **Task**

A 38 year old male patient applies to the doctor with a complaint of the short transient unpredictable attacks of sensation of rotation of the surrounding objects, unpleasant smell and unusual taste. Objectively: upper right side quadrant hemianopia, instability in Romberg posture with deviation to the right.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 43 year old female patient complains of the periodical transient unpleasant sensation of flashes, luminous points, flame in front of the eyes. The forms of the known objects become distorted for a second or two, then go back. At the same moment face recognition is broken. Objectively: visual acuity is 1, 0. Right side quadrant hemianopia is present.

- Identify the syndromes.
- Make a topical diagnosis.

### **Task**

A 30 year old male patient is an engineer in occupation. The patient applies to the doctor with a complaint of the difficulty performing actions (incorrect button up, difficulty in closing the door with the key); loss of the ability to calculate and to read. Objectively: can't recognize the known objects by touch and by grasping them. He isn't able to name his fingers, to calculate, to read text, to dress independently.

- Identify the syndromes.
- Make a topical diagnosis.

### **Task**

In a 57 old male patient acute weakness and numbness in the right extremities developed after the emotional stress. Objectively: right side hemianopia is present, the right angle of the mouth is lowered, protruded tongue is deviated to the right. Right side hemiparesis (with the increased muscle tone, high tendon reflexes and positive Babinski sign) is present as well as loss of all types of sensation in a right side of the body.

- Identify the syndromes.
- Make a topical diagnosis.

### **Task**

A 60 year old male patient complains of burning pain in the right half of the body and in the right extremities, unsteady gait. Objectively: right side hemianopia; right side hemihypesthesia; deviation to the right when walking. The right hand is flexed in the carporadial joint, it's fingers periodically involuntarily squeezed to each other or fixed in the abnormal, pretentious postures, that are quickly changed .

- Diagnose the syndromes.
- Make a topical diagnosis.

### **Task**

The few last years a female patient complains of the involuntary twitching in the extremities and in different parts of the body, that disturbed the purposeful voluntary movements. Objectively:

fast, arrhythmic, violent, chaotic, systemic loss of movements in extremities, body trunk, muscles of the face; the patient can not fix the protruded tongue and extremities at rest.

- Diagnose the syndromes.
- Make a topical diagnosis.

#### **Task**

In a 49 old male patient the paralysis in the right extremities and a drooping of the upper left eyelid developed acutely after the bath with hot steam. Objectively: strabismus divergence and ptosis on the left side. The left pupil is wider than the right one. The right angle of the mouth is lowered. The deviation of the tongue is present on the right side. There is loss of movements on the right side. Tendon reflexes and muscle tone are higher on the right- side than on the left. Hemihyesthesia on the right side is present.

- Define the syndromes.
- Make a topical diagnosis.

#### **Task**

In a 66 year old patient distortion of the right side of face and loss of movements in the left extremities developed suddenly in the morning. Objectively: inability to close the right eye is present. The wrinkles of the forehead are lost on the right side. The right angle of the mouth is lowered. There is also deviation of the tongue to the left side and left -side hemiparalysis with high tendon reflexes and Babinski sign .

- Define the syndromes
- Make a topical diagnosis

#### **Task**

In a patient paralysis in the right extremities, the deviation of the face and double vision developed acutely. Objectively: strabismus convergence in the left eye, inability to close the left eye , the loss of wrinkles of the forehead on the left side, lowering of the left angle of the mouth, hemiparalysis on the right side with high tendon reflexes and Babinski sign, hemihyesthesia on the right side are present .

- Define the syndromes.
- Make a topical diagnosis.

#### **Task**

In a 66 old male patient, paralysis on the left extremities and disturbances of the speech gradually developed. Objectively: the protruded tongue deviated to the right side. The atrophy of muscles of a right half of the tongue is present. Articulation is disturbed. Active movements are absent in the left extremities. Tendon reflexes are increased and Babinski reflex is positive on the left side.

- Define the syndromes.
- Make a topical diagnosis.

#### **Task**

In a 46 old female patient in the last few months the weakness in the left extremities and disturbances of the voice (“nasal tone”) gradually has developed. Difficulties in the swallowing have appeared. Objectively: the protruded tongue deviates to the right side, the voice is voiceless. The speech is with the nasal tone. The right half of the palatine is paralyzed, the gag reflex is absent on the right side. The muscle strength is decreased in the left extremities, tendon reflexes are increased in the left extremities. Babinski sign is positive on the left side.

- Define the syndromes.
- Make a topical diagnosis.

#### **Task**

In a 17 old male patient acute the paralysis in all extremities and the disturbance of the respiration developed immediately after diving upside down into the pool. Objectively: tetraplegia. The sensation is preserved only in the face and in the parietal region of the head. Respiratory failure is present.

- Define the syndrome.
- Make a topical diagnosis.

### **Task**

In a 10 old male patient the paralysis of arms and legs and disturbances of the micturition developed after the road accident.

Objectively: active movements in the extremities are absent; tendon reflexes in the arms are lost, the superficial abdominal reflexes are absent, tendon reflexes in the legs are increased, feet and kneecap clonus are observed Bilateral pathological pyramidal signs are positive in legs. There is a sensory loss below the C6 level a sensory loss below the C6 spinal segment. The delay of the micturition is present.

- Define the syndrome.
- Make a topical diagnosis.

### **Task**

In a 37 old male patient the weakness in the lower extremities and disturbances of the micturition have gradually developed during the last year,. Objectively: loss of muscle tone, motor function, reflex activity and somatic sensation below a thoracic level.

- Define the syndrome.
- Make a topical diagnosis.

### **Task**

A female patient complains of the pain in the lower back, difficulty walking, numbness in the inner thighs, legs and feet, lack of bladder control; rectal [incontinence](#).

Objectively: motor weakness and partial sensory loss in both legs, and saddle anesthesia (sensory loss in the sacral and coccygeal segments).

- Define the syndrome.
- Make a topical diagnosis.

### **Task**

A 43-year-old woman describes lancinating pains radiating into the right side of her jaw. This discomfort has been present for more than 3 years and has started occurring more than once a week. The pain is paroxysmal and routinely triggered by cold stimuli, such as ice cream and cold drinks. She has sought relief with multiple dental procedures and has already had two teeth extracted. Multiple neuroimaging studies reveal no structural lesions in her head. Assuming there are no contraindications to the treatment, what will you prescribe her?

### **Task**

A patient with diabetes mellitus complains of numbness and tingling in feet. Objectively: all sensory modalities are decreased in a stocking-glove pattern. Ankle reflexes are lost.

- Define the syndrome.
- Make a topical diagnosis.

### **Task**

A patient complains of numbness and tingling in hypothenar region of palm, along the little finger and ulnar half of the ring finger, associated with a weakness of small finger. Objectively: partial clawing of the ring and little finger (hyperextension at the metacarpophalangeal joints and flexion of the interphalangeal joints) and wasting of the small muscles of the hand. Tapping over the cubital tunnel causes pain.

- Define the syndrome.

- Make a topical diagnosis.

### **Task**

A patient complains of pain at the wrist and numbness and tingling in the hand, particularly during the use of the hand with forced flexion or extension at the wrist. Neurological examination: sensory loss in the first three digits and the radial half of the fourth digit. Weakness of thumb abduction and opposition. Thenar atrophy

- Name the syndrome.
- Make a topical diagnosis.

### **Task**

A patient complains of “drooping” of the wrist and fingers and “inability to use the hand” (inability to extend the wrist and fingers). He noticed this disorder in the morning after a long sleep. Neurological examination: weak wrist extension, and weak extension of all digits is present. There is no sensory findings.

- Name the syndrome.
- Make a topical diagnosis.

### **Task**

A patient complains of sensory loss on the ventral thigh, buckling of the knee (on uneven surfaces) and falls (leg “collapses”). Objectively: atrophy and weakness of quadriceps muscles. Knee reflex is absent. Sensory loss over anterior aspect of thigh and medial side of lower leg.

- Name the syndrome.
- Make a topical diagnosis.

### **Task**

A patient complains of left foot drop that leads to falls. Objectively: weakness of extension (“dorsiflexion”) of left foot and toes. Decreased sensation in the dorsum of the foot.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

In a 10-year-old child a weakness and loss of sensation in the right arm developed after the clavicle injury. Objectively: Weakness of proximal and distal muscles of right arm, including levator scapulae and serratus anterior. Complete sensory loss in affected arm with pain. Horner- Clod Bernard syndrome is positive on the right side

- Make a topical diagnosis.

### **Tasks for the assessment of competence "PC – 5":**

#### **Task**

A 52 year- old man developed right arm, hand and leg weakness two hours prior to admission to the emergency department. At the time of examination, dysphasia was noted. Over the ensuing hour the patient became obtunded, areflexic on the right side, and completely unable to lift the right arm against gravity. The physical exam added no new information.

- What syndrome should be diagnosed?
- What structures are involved?
- Where is the focus of the lesion?

#### **Task**

A 65 year-old man complained of weakness in the right arm. For 3 months he had been dropping objects, and it was gradually getting worse. There were no sensory symptoms. On exam, the patient was mildly confused and speech was slow and slurred. The right nasolabial fold was flat. Muscle bulk was normal. No fasciculations were seen. Muscle tone was increased in the right extremities

("clasp-knife"). Strength was diminished in the right intrinsic hand muscles, the wrist dorsiflexors, triceps, deltoids, iliopsoas, hamstrings and tibialis anterior. A right pronator drift was observed. Finger movements were slow on the right. The right leg circumducted while walking. Reflexes were hyperactive on the right. The right plantar response was extensor. Sensation to touch, pin, cool, vibration was normal. Two-point discrimination, point localization and graphesthesia were poorly done on the right in comparison with the left.

- List features of the clinical upper motor neuron and low motor neuron syndromes.
- What are possible sites of a lesion in this case?
- Name possible causes of the disease in this patient

### **Task**

A 67 year old patient complains of general weakness, headache and weakness in the left arm. Objectively: range of active movements in the left arm is limited, upper Barre test is positive on the left side, a muscle tone is increased in the muscles- flexors of the left arm, tendon reflexes in the left side biceps and triceps muscles are higher than on the right side.

- Name the syndrome.
- Make a topical diagnosis.

### **Task**

A 10 year old female patient has the seizures in the left arm, that continue for 2-3 minutes without loss of consciousness. For the last 2-3 weeks the attacks have become more frequent and accompanied with the twitching in the left half of the face.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 38 year old patient complains of the gradually growing weakness in the left arm in the last few months. Objectively: hypotrophy of the hand muscles and forearm on the left side. Muscle strength in the fingers flexors is rated by 3/5 scores on the left side. Upper Barre test is positive on the left side. Tendon reflexes on the left side are less than on the right side. Fasciculations are present in the left forearm flexors.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 20 year old patient complains of the weakness and periodical disturbances of a micturition. Objectively: a muscle tone in the legs is increased. Muscles strength in the tight flexors is rated by 3/5 scores. Tendon reflexes in the legs are increased; clonus positive Babinski signs are present on the both sides. Superficial abdominal reflexes: high lines are intact, middle and lower are decreased.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 57 year old patient complains of the gradually growing weakness in the arms. In the last 2 month the weakness in the legs and disturbances of a micturition have been observed.

Objectively: muscles strength is rated by 3/5 scores in the arms and 4/5 scores in the legs. Hypotrophy of the muscles in the upper extremities and fasciculation in the shoulder muscles are present. A muscle tone is decreased in the arms and increased in the legs. Tendon reflexes in the arms are decreased and increased in the legs. Superficial abdominal reflexes are absent.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A patient complains of the weakness in the right leg while long walking.

Objectively: range of active and passive movements is not limited. Knee jerk reflex is decreased on the right side. Fasciculations are present in the right tight muscles.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A patient complains of the staggering in the left side while walking, awkwardness in the left arm and leg, disturbances of the speech (words are fragmented into syllables). Objectively: ataxia in the left extremities, a decreased muscle tone in them, tilting to the left side in Romberg's test

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 9 year old patient complains of the headache, staggering while walking, awkwardness in the extremities.

Objectively. Great amplitude nystagmus. Decreased muscle tone in the extremities on both sides. Instability in Romberg posture and while walking (staggering forward and backward). Ataxia in the lower and upper extremities.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 30 year old female patient applies to the ambulance with complaints of the sluggishness, disturbances while walking, general slowness of the movements, tremor in the arms on rest. Objectively: an increased muscle tone in the extremities on both sides, growing after the repetitive passive movements. Hypomimic face. Tremor at rest in the distal parts of extremities.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A patient complains of the staggering in the left side while walking, awkwardness in the left arm and leg, disturbances of the speech (words are fragmented into syllables). Objectively: ataxia in the left extremities, a decreased muscle tone in them, tilting to the left side in Romberg's test

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 9 year old patient complains of the headache, staggering while walking, awkwardness in the extremities.

Objectively. Great amplitude nystagmus. Decreased muscle tone in the extremities on both sides. Instability in Romberg posture and while walking (staggering forward and backward). Ataxia in the lower and upper extremities.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 30 year old female patient applies to the ambulance with complaints of the sluggishness, disturbances while walking, general slowness of the movements, tremor in the arms on rest. Objectively: an increased muscle tone in the extremities on both sides, growing after the repetitive passive movements. Hypomimic face. Tremor at rest in the distal parts of extremities.

- Identify the syndrome.

- Make a topical diagnosis.

### **Task**

The parents of a 5 year old child began to observe awkwardness in his arms and instability while walking 3-4 months ago.

Objectively. Horizontal nystagmus while looking to both sides is present. Muscle tone is decreased, more in the right extremities. A finger-nose test is made with dysmetria and intentional tremor by the both arms. The patient deviates to the right while walking.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 40 year old female patient . The relatives begin to observe the behavioral disturbances. The patient became untidy and began to write worse. Objectively: repetitive, brief, irregular involuntary movements that involves the hands, feet, and face. The movements are not rhythmic and they seem to flow from one muscle to the next. The mouth and tongue continually move and the speech of the patient is not clear.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 16 year old female patient complains of the staggering while walking, awkwardness in the extremities (difficult to button up), disturbances of the handwriting. Objectively: horizontal nystagmus with more amplitude while looking to the right. Muscle tone in the right extremities is decreased. In Romberg test and while walking the right side staggering is observed .A finger-nose test is made with intentional tremor and missing a target. Ataxia in the heel- shin test is present. Dysdyadochokynesia and dysmetria on the right side are observed.

- Identify the syndrome.
- Make a topical diagnosis

### **Task**

A 55 year old right-handed man presented with a 4 hour history of weakness, tingling of the right hand and numbness of the right half of the mouth. Mild difficulty was experienced with word finding. Symptoms had improved since onset, but had not fully resolved. There was no significant past symptomatology.

Vital signs and general physical exam were normal. Mental status and speech were normal. Right nasolabial fold was flat relative to the left, but all other cranial nerve functions were intact. Subjective numbness was noted over the right distal hand, with errors exhibited in tests for two-point discrimination and graphesthesia. A mild right arm pronator drift and clumsiness of finger tapping in the right hand were observed. Reflexes were slightly more active on the right. The right toe was upgoing.

- What syndromes are revealed in the patient?
- Where is the likely focus of the lesion?

### **Task**

A 47 year-old right-handed man developed progressive numbness of feet over a 6 month period. Recently, his fingertips started feeling numb. He described an unpleasant burning sensation. Weakness was denied.

On exam, mentation and cranial nerves were normal. There were no palpably enlarged nerves, nor high arches. Position and vibration sense were grossly diminished in the feet. Cool stimuli and pin were perceived, but there was a subjective stocking distribution of numbness to mid-calf bilaterally. Reflexes were absent at the ankles and diminished elsewhere. Strength was close to normal, except that he could not walk on his heels.

- What type of sensory disorder is present?

### Task

A 42 year old patient had been losing the difference between the cold and warmth in the right arm and hand for the last 3 years. As a result, the patient got the burns of the arm and body many times. Objectively: analgesia and thermoanalgesia in the right arm and in the right half of the body to the level of umbilicus are present. Tactile and deep sensation remain intact, the pain feeling is absent.

- Identify the syndrome.
- Make a topical diagnosis.

### Task

In a 38 year old female patient a girdle pain appears on the level of the lower angle of the scapulae 2 years ago. At present the patient complains of the staggering while walking, especially during darkness. Objectively: decreasing of the proprioception in both legs is present.

- Identify the syndrome.
- Make a topical diagnosis.

### Task

In a 14 year old patient the paralysis in the left extremities and a lost of deep sensation in the left half of the body and left extremities is observed. Objectively: plegia in the left extremities is present. Tendon reflexes on left side are higher than on the right side. Superficial abdominal reflexes are lost on the left side. The pain and temperature sensation are lost from the level of clavicle and below on the right side.

- Identify the syndrome.
- Make a topical diagnosis.

### Task

A patient has been a heavy drinker for the last few years. He has begun to observe the pain and a decreasing of sensation in the arms and legs for the last 2-3 months.

Objectively: A decrease of all types of sensation in the arms and legs according to the type the “socks “ and “ glows” is present. Ankle jerk reflexes are absent.

- Identify the syndrome.
- Make a topical diagnosis.

### Task

A patient applies to the doctor with complaint of the attacks of a decreasing sensation, with “creeping” feeling in the right hand, that last during 1-2 minutes. Between attacks the condition of the patient is satisfy. The sensation disorders are not detected by neurological examination .

- Identify the syndrome.
- Make a topical diagnosis.

### Task

A 26 years old female patient applies to the doctor with a complaint of the decrease of the vision sharpness. Objectively : anosmia on the right side is present. Visual acuity is lost in the right eye. An atrophy of the optical nerve in the right eye and papilloedema in the left eye are detected by ophtalmoscopy.

- Identify the syndrome.
- Make a topical diagnosis.

### Task

A 40 year old male patient applies to the doctor with complaint of transient attacks of unpleasant smell feeling that last for 1-2 minutes. Objectively: left-side quadrant hemianopia is present.

- Make a topical diagnosis.

### Task

A 26 year-old right-handed woman complained of headache and blurred vision for 6 weeks. There was no history of underlying disease nor head trauma. Fundi showed bilateral papilledema. Visual fields were concentrically constricted and her blind spot was enlarged, but acuity was 20/20 (normal) in each eye.

- What is papilledema? What may mimic it?
- What is the differential diagnosis of this case?
- How would you proceed?

### Task

A 63 year-old man presented to the emergency room because he was unable to see objects to his left. This came to his attention when he was sideswiped by a garbage truck in cross-traffic. On examination he had a left homonymous hemianopsia. Saccades could be made in all directions but smooth eye movements were interrupted by frequent saccadic eye movements. The remaining neurological exam was negative.

- What is the course of fibers from retina to occipital lobe?
- What is the significance of:  
Homonymous hemianopia?  
Heteronymous hemianopia?  
Homonymous superior quadrantanopia?
- What is the significance of congruity in a field defect?
- What is the significance of the smooth pursuit defect in this case?

### Task

A 25 year-old woman suddenly notices that her left pupil is larger than her right (5 vs 3 mm).

- What is the pathway mediating the pupillary light reflex?
- What is the differential diagnosis of anisocoria?
- What is a "III-rd nerve palsy"? A "Homer's Syndrome"? What do each signify?

### Task

A 50 year old patient was hospitalized with complaints of shooting pains in the left part of his face. The attacks last from several seconds to several minutes. The attacks are provoked by chewing, talking, washing, cleaning teeth. On neurological examination no pathology was revealed.

- Make a diagnosis and prescribe treatment.

### Task

A patient complains of the double vision in the eyes, especially looking laterally. Objectively: the movements in the right eye are totally absent, the right upper eyelid is lowered, the right papilla is wider than the left one. There is loss of photoreaction, accommodation and convergence.

- Identify the syndrome.
- Make a topical diagnosis

### Task

A 62 year old patient went to a doctor with a complaint of the weakness in the right extremities and a double vision. Objectively: dropping eyelid is present on the left side. Widening of the left papillae, and a strabismus divergence on the left side. On the right side hemiplegia with high muscle tone and tendon reflexes and positive Babinski sign is present.

- Name the syndrome.
- Make a topical diagnosis

### Task

In a 65 year old female there was a sudden development of the palsy in the right extremities and a double vision. Objectively: strabismus convergence in the left eye is present. The movements of the left eye are limited laterally. Upper motor hemiparesis on the right side is detected.

- Identify the syndrome.
- Make a topical diagnosis

### **Task**

In a 48 year old male patient weakness and numbness in the right extremities appeared acutely after the physical overstrain. Objectively: the eyes are turned to the left side. The active movements are limited in the right extremities. The muscle strength is rated as 3/5 scores, the tendon reflexes are increased. Right side hemianesthesia is present.

- Identify the syndrome.
- Make a topical diagnosis

### **Task**

A patient has been suffering from a syringobulbomyelia. After the neurological examination the doctor noted the dissociated sensory loss (pain and temperature sensation lost, touch retained) in the lateral face area ("onion skin" pattern). In the central part of the face the sensation was intact.

- Make a topical diagnosis.

### **Task**

In a 55 year old female the acute attacks of the pain in the region of the left cheek with irradiation in the left ear appeared. The pain is short, shoots like very intensive, provoked by chewing, speech, swallowing, cooling. The drugs don't help in the moment of the attacks. Objectively: neurological deficit is not found.

- Identify the syndrome.
- Make a topical diagnosis

### **Task**

In a 16 year old male suddenly, after the cooling, the face distorted and taste became worse. Objectively: the loss of expression in right half of the face with an inability to close the eyes, to raise an eyebrow and to frown. There is also a decrease of lacrimation on the right side, increased sensitivity to sound in right ear, reduced sense of taste in two thirds of the right half of the tongue

- Identify the syndrome.
- Make a topical diagnosis

### **Task**

A 46 year old male patient applies to the doctor with complaint of the double vision in the eyes. Objectively : dropping eyelid and widening of the papillae are present on the left side. The left eye is turned outside and downwards.

Make a topical diagnosis

### **Task**

A 50 year-old woman complained of dizziness when turning over in bed. She was otherwise well and without antecedent illness or medical history of note. Exam demonstrated transient torsional-vertical nystagmus after the patient quickly moved her head back with the right ear down.

- Give a general approach to the "dizzy patient". Begin with likely causes of dizziness.
- When is dizziness "vertigo". What are some important etiologies of vertigo?
- What studies can be done to clarify the etiology of vertigo?

### **Task**

A 33 year-old woman slowly developed tinnitus and lost hearing in her left ear over a 2 year period. There were no other reported symptoms. Exam confirmed decreased acuity on the left, with air conduction greater than bone conduction bilaterally, and Weber lateralizing to the right ear. The

left corneal reflex was diminished. A mild clumsiness and intention tremor was noted in the left hand.

- What is the differential diagnosis of hearing loss in one ear?
- What neural systems are impaired in this woman? What is the likely diagnosis?

### **Task**

A female patient applies to the doctor with a complaint of the decreasing sharpness of the hearing and presence of the noise in the right ear and dizziness. Objectively: a decrease of sensation in the right half of the face is present. There is loss of the right corneal reflex, right side paralysis of the mimic face muscles, staggering to the right when standing in Romberg's posture and intentional tremor during a finger-to-nose test on the right side.

- Name the syndrome.
- Make a topical diagnosis.

### **Task**

A 12 year old patient complains of the decreasing sharpness of the hearing and presence of the permanent noise in the left ear and transient dizziness that are accompanied by nausea and staggering while a walking. Objectively hypoakusia on the left side, nystagmus and staggering the left in Romberg's posture are present..

- Name the syndrome.
- Make a topical diagnosis.

### **Task**

A 12 year old patient complains of the decreasing sharpness of the hearing and presence of the permanent noise in the left ear and transient dizziness that are accompanied by nausea and staggering while a walking. Objectively hypoakusia on the left side, nystagmus and staggering the left in Romberg's posture are present..

- Name the syndrome.
- Make a topical diagnosis.

### **Task**

A 12 year old child has been suffering from diphtheria. On the 15-d day of the disease disturbances during swallowing, "nasal tone" and hoarseness of the voice appeared,. Objectively: excursion of the palatine during the phonation is limited, palatine and pharyngeal reflexes are lost, tachycardia is present.

- Diagnose the syndrome.
- Make a topical diagnosis.

### **Task**

In a 43 year old patient the disorder of the swallowing, slurred speech and loss of sonority of voice appeared during the last 2 months. Objectively: palatal movement is absent on the right side, gag reflex is absent on the same side, dysphagia, dysphonia, dysarthria are present. The protruded tongue is deviated to the right side, a right half of the tongue is wasted and wrinkled.

- Diagnose the syndrome.
- Make a topical diagnosis.

### **Task**

A male presents with fever, headache and neck and arm weakness. 2 weeks ago he worked in the forest and removed the tick from the neck. In 7 days flu-like symptoms developed and 8 days later the weakness occurred. Objectively: flaccid paresis of the neck extensors with his head hanging on his chest is present as well as the flaccid paresis of shoulder girdle muscles. The patient can not raise the arms above the horizontal line; the head hangs on the chest.

- Make a topical diagnosis.

**Task**

A 59 y/o right-handed man was brought to the emergency room because of sudden onset of disturbance of speech. On examination, he spoke spontaneously and excessively but conveyed little meaning. There are paraphrasias and neologisms. He could carry out only very simple instructions. Naming, repetition, and reading are impaired.

- 1/ Identify the syndrome
- 2/ Make a topical diagnosis
- 3 Describe Broca's vs. Wernicke's aphasia & usual lesion site.

**Task**

A 50 year old patient was hospitalized to the emergency . At work he had a transient loss of consciousness

Objectively high arterial pressure was registered. The level of consciousness was normal. The comprehension of the addressed speech was intact and the patient carried out primitive instructions (such as "Shake the hand"). At the same time the patient couldn't not answer the questions and only pronounced the sounds " yea-yea".

- Identify the syndrome.
- Make a topical diagnosis.

**Task**

A 30 year old female patient has been suffering from a rheumatic heart valve defect . The relatives said that this disorder had an acute onset. Objectively: he didn't follow the instructions, couldn't not show the parts of his body by request and didn't differentiate the phonemes. The speech was fluid, but the words were not understandable. The speech was so disorganized that it made no linguistic or grammatical sense ("words salad").

- Identify the syndrome.
- Make a topical diagnosis.

**Task**

A patient noted difficulties in reading, (forgot letters) and oral account. Objectively: he is not able to recognize objects by touch with his right arm. He laces up the shoes with difficulty, makes mistakes in counting, and forgets letters.

- Identify the defect of mental functions.
- Make a topical diagnosis

**Task**

A female patient, a pianist, noted difficulties in playing in quick temp. At the same time the disturbances of the speech developed. Now she is not able to pronounce long words and makes mistakes in writing.

- Identify the movements and speech disorders

**Task**

A 14 year old patient. The parents noted behavioral disturbances: foolishness, untidiness, a decrease of the memory. Objectively: the patient is disinhibited, doesn't follow the instructions quickly, repeats the words after the doctor, makes stereotypic movements.

- Identify the syndrome.
- Make a topical diagnosis.

**Task**

In a 59 old male patient speech disorders and weakness in the right extremities (more in the arm) developed suddenly. Objectively: the range of active movements is limited in the right extremities. Barre test is positive on the right side, more in the arm. The muscle tone is increased in the flexors muscles of the right arm and in the extensors muscles of the right leg. The tendon reflexes

on the right side are increased. Babinski sign is positive on the right side. The motor aphasia is present.

3. Determine the syndrome
4. Make a topical diagnosis

### **Task**

A 30 year old female patient . Last year her behavior changed. The patient became untidy and tended to feeble jokes. Deterioration of vision developed. Objectively: there are left optic disc atrophy, papilledema in the right eye and left side anosmia. The speech of the patient is slow and inexpressive.

3. Diagnose the syndromes.
4. Make a topical diagnosis.

### **Task**

A 38 year old male patient applies to the doctor with a complaint of the short transient unpredictable attacks of sensation of rotation of the surrounding objects, unpleasant smell and unusual taste. Objectively: upper right side quadrant hemianopia, instability in Romberg posture with deviation to the right.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 43 year old female patient complains of the periodical transient unpleasant sensation of flashes, luminous points, flame in front of the eyes. The forms of the known objects become distorted for a second or two, then go back. At the same moment face recognition is broken. Objectively: visual acuity is 1, 0. Right side quadrant hemianopia is present.

- Identify the syndromes.
- Make a topical diagnosis.

### **Task**

A 30 year old male patient is an engineer in occupation. The patient applies to the doctor with a complaint of the difficulty performing actions (incorrect button up, difficulty in closing the door with the key); loss of the ability to calculate and to read. Objectively: can't recognize the known objects by touch and by grasping them. He isn't able to name his fingers, to calculate, to read text, to dress independently.

- Identify the syndromes.
- Make a topical diagnosis.

### **Task**

In a 57 old male patient acute weakness and numbness in the right extremities developed after the emotional stress. Objectively: right side hemianopia is present, the right angle of the mouth is lowered, protruded tongue is deviated to the right. Right side hemiparesis (with the increased muscle tone, high tendon reflexes and positive Babinski sign) is present as well as loss of all types of sensation in a right side of the body.

- Identify the syndromes.
- Make a topical diagnosis.

### **Task**

A 60 year old male patient complains of burning pain in the right half of the body and in the right extremities, unsteady gait. Objectively: right side hemianopia; right side hemihyesthesia; deviation to the right when walking. The right hand is flexed in the carporadial joint, it's fingers periodically involuntarily squeezed to each other or fixed in the abnormal, pretentious postures, that are quickly changed .

- Diagnose the syndromes.

- Make a topical diagnosis.

### **Task**

The few last years a female patient complains of the involuntary twitching in the extremities and in different parts of the body, that disturbed the purposeful voluntary movements. Objectively: fast, arrhythmic, violent, chaotic, systemic loss of movements in extremities, body trunk, muscles of the face; the patient can not fix the protruded tongue and extremities at rest.

- Diagnose the syndromes.
- Make a topical diagnosis.

### **Task**

In a 49 old male patient the paralysis in the right extremities and a drooping of the upper left eyelid developed acutely after the bath with hot steam. Objectively: strabismus divergence and ptosis on the left side. The left pupil is wider than the right one. The right angle of the mouth is lowered. The deviation of the tongue is present on the right side. There is loss of movements on the right side. Tendon reflexes and muscle tone are higher on the right- side than on the left. Hemihyesthesia on the right side is present.

- Define the syndromes.
- Make a topical diagnosis.

### **Task**

In a 66 year old patient distortion of the right side of face and loss of movements in the left extremities developed suddenly in the morning. Objectively: inability to close the right eye is present. The wrinkles of the forehead are lost on the right side. The right angle of the mouth is lowered. There is also deviation of the tongue to the left side and left -side hemiparalysis with high tendon reflexes and Babinski sign .

- Define the syndromes
- Make a topical diagnosis

### **Task**

In a patient paralysis in the right extremities, the deviation of the face and double vision developed acutely. Objectively: strabismus convergence in the left eye, inability to close the left eye , the loss of wrinkles of the forehead on the left side, lowering of the left angle of the mouth, hemiparalysis on the right side with high tendon reflexes and Babinski sign, hemihyesthesia on the right side are present .

- Define the syndromes.
- Make a topical diagnosis.

### **Task**

In a 66 old male patient, paralysis on the left extremities and disturbances of the speech gradually developed. Objectively: the protruded tongue deviated to the right side. The atrophy of muscles of a right half of the tongue is present. Articulation is disturbed. Active movements are absent in the left extremities. Tendon reflexes are increased and Babinski reflex is positive on the left side.

- Define the syndromes.
- Make a topical diagnosis.

### **Task**

In a 46 old female patient in the last few months the weakness in the left extremities and disturbances of the voice (“nasal tone”) gradually has developed. Difficulties in the swallowing have appeared. Objectively: the protruded tongue deviates to the right side, the voice is voiceless. The speech is with the nasal tone. The right half of the palatine is paralyzed, the gag reflex is absent on the right side. The muscle strength is decreased in the left extremities, tendon reflexes are increased in the left extremities. Babinski sign is positive on the left side.

- Define the syndromes.
- Make a topical diagnosis.

### Task

In a 17 old male patient acute the paralysis in all extremities and the disturbance of the respiration developed immediately after diving upside down into the pool. Objectively: tetraplegia. The sensation is preserved only in the face and in the parietal region of the head. Respiratory failure is present.

- Define the syndrome.
- Make a topical diagnosis.

### Task

In a 10 old male patient the paralysis of arms and legs and disturbances of the micturition developed after the road accident.

Objectively: active movements in the extremities are absent; tendon reflexes in the arms are lost, the superficial abdominal reflexes are absent, tendon reflexes in the legs are increased, feet and kneecap clonus are observed Bilateral pathological pyramidal signs are positive in legs. There is a sensory loss below the C6 level a sensory loss below the C6 spinal segment. The delay of the micturition is present.

- Define the syndrome.
- Make a topical diagnosis.

### Task

In a 37 old male patient the weakness in the lower extremities and disturbances of the micturition have gradually developed during the last year,. Objectively: loss of muscle tone, motor function, reflex activity and somatic sensation below a thoracic level.

- Define the syndrome.
- Make a topical diagnosis.

### Task

A female patient complains of the pain in the lower back, difficulty walking, numbness in the inner thighs, legs and feet, lack of bladder control; rectal [incontinence](#).

Objectively: motor weakness and partial sensory loss in both legs, and saddle anesthesia (sensory loss in the sacral and coccygeal segments).

- Define the syndrome.
- Make a topical diagnosis.

### Task

A 43-year-old woman describes lancinating pains radiating into the right side of her jaw. This discomfort has been present for more than 3 years and has started occurring more than once a week. The pain is paroxysmal and routinely triggered by cold stimuli, such as ice cream and cold drinks. She has sought relief with multiple dental procedures and has already had two teeth extracted. Multiple neuroimaging studies reveal no structural lesions in her head. Assuming there are no contraindications to the treatment, what will you prescribe her?

### Task

A patient with diabetes mellitus complains of numbness and tingling in feet. Objectively: all sensory modalities are decreased in a stocking-glove pattern. Ankle reflexes are lost.

- Define the syndrome.
- Make a topical diagnosis.

### Task

A patient complains of numbness and tingling in hypothenar region of palm, along the little finger and ulnar half of the ring finger, associated with a weakness of small finger. Objectively:

partial clawing of the ring and little finger (hyperextension at the metacarpophalangeal joints and flexion of the interphalangeal joints) and wasting of the small muscles of the hand. Tapping over the cubital tunnel causes pain.

- Define the syndrome.
- Make a topical diagnosis.

### **Task**

A patient complains of pain at the wrist and numbness and tingling in the hand, particularly during the use of the hand with forced flexion or extension at the wrist. Neurological examination: sensory loss in the first three digits and the radial half of the fourth digit. Weakness of thumb abduction and opposition. Thenar atrophy

- Name the syndrome.
- Make a topical diagnosis.

### **Task**

A patient complains of “drooping” of the wrist and fingers and “inability to use the hand” (inability to extend the wrist and fingers). He noticed this disorder in the morning after a long sleep. Neurological examination: weak wrist extension, and weak extension of all digits is present. There is no sensory findings.

- Name the syndrome.
- Make a topical diagnosis.

### **Task**

A patient complains of sensory loss on the ventral thigh, buckling of the knee (on uneven surfaces) and falls (leg “collapses”). Objectively: atrophy and weakness of quadriceps muscles. Knee reflex is absent. Sensory loss over anterior aspect of thigh and medial side of lower leg.

- Name the syndrome.
- Make a topical diagnosis.

### **Task**

A patient complains of left foot drop that leads to falls. Objectively: weakness of extension (“dorsiflexion”) of left foot and toes. Decreased sensation in the dorsum of the foot.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

In a 10-year-old child a weakness and loss of sensation in the right arm developed after the clavicle injury. Objectively: Weakness of proximal and distal muscles of right arm, including levator scapulae and serratus anterior. Complete sensory loss in affected arm with pain. Horner- Clod Bernard syndrome is positive on the right side

- Make a topical diagnosis.

### **Task**

A 72 year old woman was hospitalized with speech disorder, weakness in both her arm and leg and paralysis of a gaze. The disease began suddenly when she woke up in the morning. During last week she had two attacks of transient monocular blindness, which lasted for a few seconds.

Objectively: The level of consciousness was normal, but the woman could not speak. Her face was pale, blood pressure was 180/100 mm Hg, pulse was arrhythmical. There was motor aphasia, conjugate gaze deviation to the left, right side hemiparesis and positive Babinsky’s sign.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

### **Task**

A 45 year old man was admitted to clinic. His level of consciousness was reduced, with GCS =10. He had severe headache, vomiting and weakness in both his arm and leg. The disease has developed suddenly after emotional overstrain. Also the patient has been suffering from hypertension for a long time.

Objectively: the patient's face is red. His blood pressure is 220/120 mm Hg, and his pulse is 60 beats per minute. Neck muscles rigidity is about 3 cm, Kerning symptom is positive at an angle of 100°. The left pupil is dilated and right side hemiparesis and hemihyposthesia are observed.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

### **Task**

A 35 year old man was admitted to the emergency room with confused state. The disease had an acute onset. It began suddenly with a very severe headache, after which the disturbance of consciousness and vomiting developed.

Objectively: there is delirium, neck muscles rigidity of 5 cm, Kerning's symptom. Focal neurologic symptoms are absent.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?

### **Task**

How would you comment the following CSF?

- Pleocytosis is 120/mm<sup>3</sup>
- Lymphocytes are 100/ mm<sup>3</sup>
- Polymorphonuclear leukocytes are 20/ mm<sup>3</sup>
- Proteins are 1.66 g/L
- Sugar content is 20 mg/dL
- CSF is cloudy with clots.

### **Task**

How would you comment the following CSF?

- CSF pressure is 400 mm H<sub>2</sub>O
- The CSF is cloudy and of yellow-green color
- Cytosis is 2000/ mm<sup>3</sup> ; polymorphonuclear leukocytes (neutrophils) are prevailed
- Protein is 5,6 g/L
- Sugar content is 20 mg/dL.

### **Task**

A 36 year old woman was hospitalized with severe headache and weakness in both her left arm and leg. Disease has been developing gradually for 2 weeks. The woman has chronic infection in the middle ear.

Objectively: the patient is confused; body temperature is 38,9°. Left side spastic hemiparesis and papilledema are present.

Laboratory blood tests: the cell count and erythrocyte sedimentation rate are elevated.

The brain precontrast CT scan reveals an area of higher density than the surrounding edematous brain in the right frontal lobe. The contrast CT study demonstrates rim enhancing lesion with thickened capsule and hypodense central cavity.

- What is the diagnosis
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### **Task**

A 20 year old female complains of fever, chills, severe headache, nausea and vomiting. The onset of disease was acute

Objectively: level of consciousness is altered (GCS = 13). The body temperature is 39°C. There are petechiae on the skin. Fast pulse, shortness of breath and stiffness of neck muscles are present. Kernig's sign is positive.

- What is an preliminary diagnosis?
- What laboratory data are needed for the final diagnosis?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### **Task**

A 22 year old male patient has been suffering from weakness, irritability, headache, fever, vomiting and insomnia for 8 days. The last 2 days the visual acuity decreased and double vision appeared.

Objectively: body temperature is 37,8°C. Stiffness of neck muscles, positive Kernig's signs, incomplete bilateral ptosis, dilatation of both pupils and slight strabismus divergent are observed.

- What is a preliminary diagnosis
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### **Task**

**What structures of the brain and the spinal cord are not impaired by multiple sclerosis?**

- cranial nerves nuclei
- white matter of the brain in paraventricular localization
- peduncles of cerebellum
- spinal cord white matter
- corpus callosum

### **Task**

**Which of the following CSF findings is least suggestive of acute multiple sclerosis?**

- an IgG index greater than 1.7
- increased myelin basic protein
- increased protein to 200 mg/dL
- presence of oligoclonal bands
- slight to moderate monocytic pleocytosis

### **Task**

**Which of the following signs or symptoms occurring in a young person is the most suggestive of multiple sclerosis?**

- bilateral internuclear ophthalmoplegia
- gait ataxia
- Lhermitte's sign
- optic neuritis
- vertigo

### **Task**

**Persons migrating from a zone with high risk of multiple sclerosis (MS) to one of low risk after age 15 show a risk of developing MS that is**

- equal to that of the high-risk zone
- equal to that of the low-risk zone
- intermediate between the two zones

- lower than that of the low-risk zone
- unpredictable

### Task

**A 21-year-old right-handed female student was working in the photography lab 1 week ago, which required standing all day. After that, she experienced a cold sensation in the left foot and her entire left leg fell asleep. The feeling lasted 4 to 5 days and then slowly went away. Her right lower extremity was fine. Coughing, sneezing, and the Valsalva maneuver did not worsen her symptoms. She had a slight back pain, which she thought was due to using a poor mattress. Past history includes an episode of optic neuritis in the left eye 2 years ago. At that time, she was reportedly depressed and was sleeping constantly. One day, her left eye became blurred and her vision went out. In 1 week, her vision returned to normal.**

**Her vision now is 20/20. She has not had a repeat episode since then. She had an MRI of her brain, which was normal at that time. She drinks alcohol occasionally and does not use any illicit drugs. Her only medication is birth control pills. Examination is significant for brisk reflexes and sustained clonus at the right ankle. Babinski sign is present on the right. Testing is positive for oligoclonal bands. Which of the following is the most likely diagnosis in this case?**

- Seizure
- Transient ischemic attack
- Anaplastic astrocytoma
- Multiple sclerosis
- Parkinson's disease

**What further examination is needed?**

**What results of examination are expected?**

### Task

**A patient has brought some test results from an outside doctor with her today. One of the results indicates that oligoclonal bands were positive. What are oligoclonal bands?**

- Wave frequency changes on the EEG during sleep
- Markings about the iris
- Pathologic features of Alzheimer's disease
- Chromosomal markings found with multiple sclerosis
- Immunoglobulin patterns in the cerebrospinal fluid with multiple sclerosis

### Task

**A 19-year-old man had an episode of left optic neuritis, which resolved over several weeks. Two years later there was a month long episode of bladder dysfunction. The patient underwent many tests and was told that he had multiple sclerosis. The cerebrospinal fluid in persons with multiple sclerosis will typically exhibit which of the following?**

- Glucose content of less than 20% of the serum content
- Persistently elevated total protein content
- Persistently elevated immunoglobulin G (IgG) content
- Mononuclear cell counts of greater than 100 cells per  $\mu\text{L}$ 
  - Erythrocyte counts of greater than 10 cells per  $\mu\text{L}$

### Task

**A 25 year old male patient has been suffering from chronic lymphadenopathy, weight loss, fever, and diarrhea for 2 months. Recently apathy, indifference, reduction of libido, poor concentration and memory impairment have developed.**

**Examination has revealed slight manifestation of Parkinsonism and ataxic gait.**

- What preliminary diagnosis would you make?
- What further examination is needed?
- What results of examination are expected?

- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

#### **Task**

**A 9-year-old boy is brought to your clinic by his parents because he has begun to have episodes of eye fluttering lasting several seconds. Sometimes he loses track of his thoughts in the middle of a sentence. There was one fall off a bicycle that may have been related to one of these events. There are no other associated symptoms, and the episodes may occur up to 20 or more times per day. The boy's development and health have been normal up until this point. He did have two head injuries as a young child: the first when he fell off a tricycle onto the ground, and the second when he fell off of a playset onto his head. Both episodes resulted in a brief loss of consciousness and he did not think clearly for part of the day afterward, but had no medical intervention. Which of the following tests is most likely to confirm this patient's diagnosis?**

- Brain CT scan
- Brain MRI
- Electroencephalogram
- Lumbar puncture
- Nerve conduction study

#### **Task**

**A 19-year-old right-handed man who carries the diagnosis of epilepsy is seen in the urgent care clinic. He had been healthy until about age 12, when he began to have episodes of eye fluttering lasting several seconds. Sometimes he would lose track of his thoughts in the middle of a sentence. There was one fall off of a bicycle that may have been related to one of these events. He has been treated with valproic acid. At one point he was off all medications, but the seizures returned. He is now at the end of his first semester of college and came in today because he had a witnessed generalized tonic-clonic seizure this morning. He had had only about 2 hours of sleep the night before because he was studying for a final exam. Which of the following is the most appropriate thing to tell this patient?**

- "I know that you faked this seizure to avoid taking a test."
- "Lack of sleep may have contributed to triggering this seizure."
- "You can expect to have tonic-clonic seizures on a regular basis from now on."
- "Your seizures are getting worse and there is nothing we can do about it."
- "You should take the next semester off to recover and get extensive testing."

#### **Task**

**A 56-year-old man with epilepsy is brought into the emergency room. He has been having continuous generalized tonic-clonic seizures for the past 30 min. He is treated with 2 mg of intravenous lorazepam. Most physicians recommend using a high dose of intravenous benzodiazepine as part of the management of status epilepticus because it has which of the following qualities?**

- Ability to suppress seizure activity for more than 24 h after one injection
- Lack of respiratory depressant action
- Rapid onset of action after intravenous administration
- Lack of hypotensive effects
- Lack of dependence on hepatic function for its metabolism and clearance
- 

#### **Task**

**A 44-year-old man presents with left arm shaking. Two days ago, the patient noticed left arm paresthesias along the lateral aspect of his left arm and left fourth and fifth fingers while he was reading. He thinks he may have been leaning on his left arm at the time; the symptoms**

resolved after 30 seconds. This morning, he noted the same feelings, lasting a few seconds, but then his fourth and fifth fingers started shaking rhythmically, and the shaking then spread to all of his fingers, his hand, and then his arm up to his elbow. This episode lasted a total of 30 seconds. He denies any strange smells or tastes, visual changes, or weakness. Afterward, his fingers felt locked in position for a few seconds. Then he felt as if he did not have control of his hand and had difficulty donning his socks. He and his wife decided to drive to emergency room, and in the car he had trouble putting his seat belt latch into its socket. Examination and routine labs are normal. Which of the following is the most appropriate next action?

- Discharge the patient to follow up in clinic in 2 weeks
- Obtain a brain MRI
- Obtain an electroencephalogram
- Obtain an orthopedic consult
- Order electromyography and nerve conduction studies

#### Task

A 4-year-old boy has the onset of episodes of loss of body tone, with associated falls, as well as generalized tonic-clonic seizures. His cognitive function has been deteriorating. EEG shows 1.5- to 2-Hz spike-and-wave discharges. Which of the following is the most likely diagnosis?

- Landau-Kleffner syndrome
- Lennox-Gastaut syndrome
- Juvenile myoclonic epilepsy
- Mitochondrial encephalomyopathy
- Febrile seizures

#### Task

A 27-year-old man begins to experience infrequent episodes of nausea, warmth rising through his body, and an unusual odor like rotting fish. His girlfriend notices that afterward he may develop twitching of the left side of his face and an inability to speak for several minutes. Afterward the man appears dazed and cannot remember what has occurred. He has otherwise been well. Magnetic resonance imaging of his brain is most likely to show a lesion in which of the following areas?

- Left occipital lobe
- Right frontal lobe
- Cribriform plate
- Uncus
- Left parietal lobe

#### Task

A 29-year-old man with a history of febrile seizures as a child has developed medication refractory focal seizures with impaired awareness within the past 2 years. An MRI reveals the small volume abnormality in the left temporal lobe. Which of the following is true regarding this condition?

- This patient may benefit from a neurosurgical procedure
- The patient will probably die within 2 years
- The seizures will most likely stop with further medication titration
- A head CT should be performed
- A cerebral angiogram may confirm the diagnosis

#### Task

A 37-year-old man develops involuntary twitching movements in his left thumb. Within 30 s, he notices that the twitching has spread to his entire left hand and that involuntary movements have developed in his left forearm and the left side of his face. He cannot recall what happened subsequently, but his wife reports that he fell down and the entire left side of his body appeared to be twitching. He appeared to be unresponsive for about 3 min and confused for

**another 15 min. During the episode, he bit his tongue and wet his pants. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic seizures
- Absence
- Focal seizure with impaired awareness
- Focal aware sensory seizure
- Jacksonian march

#### **Task**

**A 17-year-old boy reports involuntary jerking movements in his arms when he awakens. This has occurred during the day after a nap as well as in the morning after a full night's sleep. Over the next few months, he developed similar jerks during the day, even when he had been awake for several hours. He did not lose consciousness with these muscle jerks, but did occasionally fall. On one occasion, jerks in his legs caused a fall that resulted in a fractured wrist. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic seizures
- Absence
- Focal aware seizure
- Epilepsia partialis continua
- Myoclonic

#### **Task**

**A 21-year-old man reports several episodes over the previous 4 years during which he lost consciousness. He had no warning of the impending episodes, and with each episode he injured himself. Observers told him that he abruptly developed a blank stare and stopped talking. His body became stiff and he arched his back. After several seconds of this type of posturing, his arms and legs started shaking violently. During one of these episodes, he dislocated his right shoulder. He routinely bit his tongue and urinated in his pants during the episodes. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Generalized absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Focal aware sensory seizure

#### **Task**

**A 25-year-old woman was fired from her job after she misplaced papers vital for the company. She had had recurrent episodes for several years during which she performed nonsensical activities such as burying her plates in the backyard, hiding her underwear, and discarding her checkbook. She did not recall what she had done after performing these peculiar activities. She had been referred for psychotherapy, but the episodes became even more frequent after she was started on thioridazine (Mellaril). Her husband observed one episode and noted that she was unresponsive for about 5 min and confused for at least 1 h. She did not fall down or remain immobile during the episodes. As the episodes became more frequent, she noticed that she would develop an unpleasant taste in her mouth, reminiscent of motor oil, just before an episode. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Myoclonic

#### **Task**

**A 21-year-old cocaine-abusing man develops seizures that persist for more than 30 min before emergency medical attention is available. When examined nearly 1 h later, he is still exhibiting tonic-clonic movements and has never recovered consciousness. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Generalized absence
- Jacksonian march
- Tonic-clonic status epilepticus

**Task**

A 38-year-old patient has been suffering from morning headache for a year. The headache decreases at daytime. During the last months the headache became severe and vomiting appeared. Over the last few weeks the weakness the left extremities developed.

Objectively: papilledema and left-side hemiparesis are observed.

- Make an initial diagnosis. What is the future examination.

**Task**

The patient is a 45-year-old man. Relatives noticed the changes in his behavior: inappropriate humor, impaired ability to judgments, gait abnormalities and urinary incontinence. The patient complains of constant headache and vomiting which begins each morning before he rise from bed.

Objectively: inappropriate behavior, loss of smell sense and papilledema were revealed. Gait was noticed to be without any signs of cerebellar ataxia.

- What clinical syndromes may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis ? Justify your decision

**Task**

The 48-year-old woman complains of headaches, fatigue, muscular pains, vision disturbances and amenorrhea. She notes that she is not able longer to put on rings that used to fit and that her shoe size has progressively increased.

Objectively: enlarged hands and feet, prominent supraorbital ridges, protruded mandible, separated teeth and thick lips, enlarged tongue. Bitemporal hemianopsia.

- Make an preliminary diagnosis.
- Explain the pathophysiological mechanism of bitemporal hemianopsia
- What examinations are necessary to verify a diagnosis?

**Task**

The 46-year-old woman has been suffering from progressive unilateral right side loss of hearing for two years. Tinnitus, unstable gait and systemic dizziness appeared half a year ago. Facial numbness and facial weakness developed two weeks ago.

Objectively: papilledema, nystagmus, right side deafness, facial weakness on the right side, intentional tremor and ataxic gait were observed.

- What clinical syndromes may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

**Task**

A 45-year-old woman complains of pain and paresthesias in the left side of the thorax and weakness in the left leg. Pain appeared two months ago. Her doctor made a diagnosis of "osteochondrosis" and prescribed anti-inflammatory drugs and physiotherapy. However, pains

were growing worse, aggravating at coughing, sneezing and movements of the trunk. The pains were unbearable when the woman was lying down. Last week weakness in her left leg appeared. Objectively: left leg weakness associated with spasticity, high tendon reflexes and positive Babinsky's symptom was revealed. Decreased pain sensation from the right rib arc to the heel and decreased proprioceptive sensation in the left leg were also observed. Tenderness when tapped over the Th6 spinous process was present.

- What clinical syndrome may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### **Task**

The patient is a 45-year-old man. He complains of severe pain, numbness and tingling in the buttocks and legs, weakness in legs, and incontinence of bladder and bowels.

These disorders evolved slowly during last 4 months.

Objectively: asymmetric flaccid paraplegia in legs, absence of both ankle and knee jerks, loss of sensation in L4-S5 dermatomes (in lower extremities and an anogenital area) are observed.

- Make an initial diagnosis and prescribe examination and treatment.
- What are the major types of neurogenic bladder?

### **Task**

The patient is a 35 year old driver. He suffered from recurrent back pain for 4 years. 3 days ago he felt acute pain in the lower part of his back after lifting an heavy object. Pain irradiated to his right leg. Pain becomes worse when coughing and sneezing.

Objectively: the movements in the lumbar area are limited because of pain. Knee jerk reflexes are intact, left ankle jerk reflex is present, but the right one is absent. Reduction of muscle power of the right foot flexors is observed. Sensitivity of the lateral parts of the right foot and shin is decreased.

Make a diagnosis and prescribe the treatment for this patient.

### **Task**

A 25 year old man was admitted 15 minutes ago. He got a blow on his face and lost consciousness for 2-3 minutes. When he regain his consciousness he couldn't understand what had happened. Now he complains of headache and nausea.

Objectively: pallor of the face, sweating of palms, postural tremor of fingers and instability in Romberg's test are observed.

- Make an initial diagnosis and prescribe examination.

### **Task**

A 30 year old woman was hospitalized 2 hours after the accident. She was unconscious for 15 minutes after the trauma. Then she began to understand what she was asked about and became able to answer the questions, but was sleepy.

Objectively: perforation of the right tympanic septum and Bell's palsy were revealed.

Make an initial diagnosis and prescribe examination and treatment.

### **Task**

The patient is a 55 year old woman. A week ago she fell down and damaged the back of the head. After that a headache and vomiting developed. Then she felt satisfactory for three days. But the day before yesterday headache appeared again and became more severe. The woman was not able to go to work yesterday. And today she has been taken to hospital by her relatives.

The examination showed the following: low level of consciousness (CGS = 10), widening of the right pupil, bradycardia and left side hemiparesis with Babinsky's sign.

- Make a primary diagnosis and prescribe examination and treatment.

**Task**

A 32 year-old woman complains of pain in her back and left leg. Three weeks earlier, while standing on a ladder to change a light bulb, she suddenly felt a pain in her left thigh. Later, sharp shooting pain spread down along the posterior side of the left leg to a heel.

Pain was worsened by sitting and standing. Weakness and numbness were denied. There were no sphincter symptoms. There was no history of trauma.

- What nerve(s) and roots are implicated in this woman's pain?
- Where weakness might be expected? What reflex might be lost?
- What are the "danger" symptoms of back pain which would argue for MRI and possible early surgery?
- Give a few etiologies for low back pain.

**Task**

A 28 year old patient fell asleep after alcohol abuse. When he woke up, he felt weakness in his left hand.

Objectively: radial deviation of the hand, weak wrist extension, weak extension of all digits, normal sensory findings are observed.

- Make a diagnosis and prescribe the treatment.

**Task**

A 56-year-old female was hospitalized with complaints of burning pain in shins and feet. For last five years she periodically felt thirsty, suffered from hunger and fatigue.

Objectively: loss of both superficial and deep sensations of the stocking type and absence of ankle reflexes. Systolic blood pressure falls down to 30 mm Hg. when she changes her position from horizontal to vertical one.

- 1) Make a diagnosis and prescribe the treatment.

**Task**

A 6 year-old boy presents to clinic for evaluation of "he straddles when he stands and waddles when he walks". These abnormalities were first noted about 2 years ago, but he walked late. He has pelvic and shoulder weakness but his calves appear hypertrophic. His brother, 2 maternal first cousins, and a maternal uncle all died after becoming wheel chair bound.

- What is the inheritance pattern exhibited in this pedigree?
- What is the clinical difference between Duchenne and Becker muscular dystrophy?
- Why are women only rarely affected with Duchenne's? How can the carrier status of an at risk female be determined?
- What is dystrophin?
- In the 1990s how could the clinical diagnosis of Duchenne's muscular dystrophy be confirmed most reliably?

**Task**

A 35-year-old female presented with complaints of intermittent diplopia and ptosis, worse at the end of the day, for the last year. The diplopia fluctuated between horizontal, vertical and diagonal. She described her left eye as "lazy," and stated it had been getting progressively worse. Upon questioning, she complained of generalized muscle weakness, difficulty swallowing and breathing for the last three months.

1. List key signs and symptoms associated with systemic myasthenia gravis.
2. What history questions should one ask every patient suspected of having myasthenia gravis?
3. Describe the diagnostic tests for myasthenia gravis.
4. What are the classes of medication used to treat myasthenia gravis?

5. Describe the mechanism of action of the pharmaceutical agents involved in the treatment of myasthenia gravis.

6. What medications should be avoided in patients with myasthenia gravis?

### **Tasks for the assessment of competence "PC – 6":**

#### **Task**

A 52 year- old man developed right arm, hand and leg weakness two hours prior to admission to the emergency department. At the time of examination, dysphasia was noted. Over the ensuing hour the patient became obtunded, areflexic on the right side, and completely unable to lift the right arm against gravity. The physical exam added no new information.

- What syndrome should be diagnosed?
- What structures are involved?
- Where is the focus of the lesion?

#### **Task**

A 65 year-old man complained of weakness in the right arm. For 3 months he had been dropping objects, and it was gradually getting worse. There were no sensory symptoms. On exam, the patient was mildly confused and speech was slow and slurred. The right nasolabial fold was flat. Muscle bulk was normal. No fasciculations were seen. Muscle tone was increased in the right extremities ("clasp-knife"). Strength was diminished in the right intrinsic hand muscles, the wrist dorsiflexors, triceps, deltoids, iliopsoas, hamstrings and tibialis anterior. A right pronator drift was observed. Finger movements were slow on the right. The right leg circumducted while walking. Reflexes were hyperactive on the right. The right plantar response was extensor. Sensation to touch, pin, cool, vibration was normal. Two-point discrimination, point localization and graphesthesia were poorly done on the right in comparison with the left.

- List features of the clinical upper motor neuron and low motor neuron syndromes.
- What are possible sites of a lesion in this case?
- Name possible causes of the disease in this patient

#### **Task**

A 67 year old patient complains of general weakness, headache and weakness in the left arm. Objectively: range of active movements in the left arm is limited, upper Barre test is positive on the left side, a muscle tone is increased in the muscles- flexors of the left arm, tendon reflexes in the left side biceps and triceps muscles are higher than on the right side.

- Name the syndrome.
- Make a topical diagnosis.

#### **Task**

A 10 year old female patient has the seizures in the left arm, that continue for 2-3 minutes without loss of consciousness. For the last 2-3 weeks the attacks have become more frequent and accompanied with the twitching in the left half of the face.

- Identify the syndrome.
- Make a topical diagnosis.

#### **Task**

A 38 year old patient complains of the gradually growing weakness in the left arm in the last few months. Objectively: hypotrophy of the hand muscles and forearm on the left side. Muscle strength in the fingers flexors is rated by 3/5 scores on the left side. Upper Barre test is positive on the left side. Tendon reflexes on the left side are less than on the right side. Fasciculations are present in the left forearm flexors.

- Identify the syndrome.
- Make a topical diagnosis.

**Task**

A 20 year old patient complains of the weakness and periodical disturbances of a micturition. Objectively: a muscle tone in the legs is increased. Muscles strength in the tight flexors is rated by 3/5 scores. Tendon reflexes in the legs are increased; clonus positive Babinski signs are present on the both sides. Superficial abdominal reflexes: high lines are intact, middle and lower are decreased.

- Identify the syndrome.
- Make a topical diagnosis.

**Task**

A 57 year old patient complains of the gradually growing weakness in the arms. In the last 2 month the weakness in the legs and disturbances of a micturition have been observed.

Objectively: muscles strength is rated by 3/5 scores in the arms and 4/5 scores in the legs. Hypotrophy of the muscles in the upper extremities and fasciculation in the shoulder muscles are present. A muscle tone is decreased in the arms and increased in the legs. Tendon reflexes in the arms are decreased and increased in the legs. Superficial abdominal reflexes are absent.

- Identify the syndrome.
- Make a topical diagnosis.

**Task**

A patient complains of the weakness in the right leg while long walking.

Objectively: range of active and passive movements is not limited. Knee jerk reflex is decreased on the right side. Fasciculations are present in the right tight muscles.

- Identify the syndrome.
- Make a topical diagnosis.

**Task**

A patient complains of the staggering in the left side while walking, awkwardness in the left arm and leg, disturbances of the speech (words are fragmented into syllables). Objectively: ataxia in the left extremities, a decreased muscle tone in them, tilting to the left side in Romberg's test

- Identify the syndrome.
- Make a topical diagnosis.

**Task**

A 9 year old patient complains of the headache, staggering while walking, awkwardness in the extremities.

Objectively. Great amplitude nystagmus. Decreased muscle tone in the extremities on both sides. Instability in Romberg posture and while walking (staggering forward and backward). Ataxia in the lower and upper extremities.

- Identify the syndrome.
- Make a topical diagnosis.

**Task**

A 30 year old female patient applies to the ambulance with complaints of the sluggishness, disturbances while walking, general slowness of the movements, tremor in the arms on rest. Objectively: an increased muscle tone in the extremities on both sides, growing after the repetitive passive movements. Hypomimic face. Tremor at rest in the distal parts of extremities.

- Identify the syndrome.
- Make a topical diagnosis.

**Task**

A patient complains of the staggering in the left side while walking, awkwardness in the left arm and leg, disturbances of the speech (words are fragmented into syllables). Objectively: ataxia in the left extremities, a decreased muscle tone in them, tilting to the left side in Romberg's test

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 9 year old patient complains of the headache, staggering while walking, awkwardness in the extremities.

Objectively. Great amplitude nystagmus. Decreased muscle tone in the extremities on both sides. Instability in Romberg posture and while walking (staggering forward and backward). Ataxia in the lower and upper extremities.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 30 year old female patient applies to the ambulance with complaints of the sluggishness, disturbances while walking, general slowness of the movements, tremor in the arms on rest. Objectively: an increased muscle tone in the extremities on both sides, growing after the repetitive passive movements. Hypomimic face. Tremor at rest in the distal parts of extremities.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

The parents of a 5 year old child began to observe awkwardness in his arms and instability while walking 3-4 months ago.

Objectively. Horizontal nystagmus while looking to both sides is present. Muscle tone is decreased, more in the right extremities. A finger-nose test is made with dysmetria and intentional tremor by the both arms. The patient deviates to the right while walking.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 40 year old female patient. The relatives begin to observe the behavioral disturbances. The patient became untidy and began to write worse. Objectively: repetitive, brief, irregular involuntary movements that involves the hands, feet, and face. The movements are not rhythmic and they seem to flow from one muscle to the next. The mouth and tongue continually move and the speech of the patient is not clear.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 16 year old female patient complains of the staggering while walking, awkwardness in the extremities (difficult to button up), disturbances of the handwriting. Objectively: horizontal nystagmus with more amplitude while looking to the right. Muscle tone in the right extremities is decreased. In Romberg test and while walking the right side staggering is observed. A finger-nose test is made with intentional tremor and missing a target. Ataxia in the heel-shin test is present. Dysdiadochokinesia and dysmetria on the right side are observed.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 55 year old right-handed man presented with a 4 hour history of weakness, tingling of the right hand and numbness of the right half of the mouth. Mild difficulty was experienced with word finding. Symptoms had improved since onset, but had not fully resolved. There was no significant past symptomatology.

Vital signs and general physical exam were normal. Mental status and speech were normal. Right nasolabial fold was flat relative to the left, but all other cranial nerve functions were intact. Subjective numbness was noted over the right distal hand, with errors exhibited in tests for two-point discrimination and graphesthesia. A mild right arm pronator drift and clumsiness of finger tapping in the right hand were observed. Reflexes were slightly more active on the right. The right toe was upgoing.

- What syndromes are revealed in the patient?
- Where is the likely focus of the lesion?

### **Task**

A 47 year-old right-handed man developed progressive numbness of feet over a 6 month period. Recently, his fingertips started feeling numb. He described an unpleasant burning sensation. Weakness was denied.

On exam, mentation and cranial nerves were normal. There were no palpably enlarged nerves, nor high arches. Position and vibration sense were grossly diminished in the feet. Cool stimuli and pin were perceived, but there was a subjective stocking distribution of numbness to mid-calf bilaterally. Reflexes were absent at the ankles and diminished elsewhere. Strength was close to normal, except that he could not walk on his heels.

- What type of sensory disorder is present?

### **Task**

A 42 year old patient had been losing the difference between the cold and warmth in the right arm and hand for the last 3 years. As a result, the patient got the burns of the arm and body many times. Objectively: analgesia and thermoanalgesia in the right arm and in the right half of the body to the level of umbilicus are present. Tactile and deep sensation remain intact, the pain feeling is absent.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

In a 38 year old female patient a girdle pain appears on the level of the lower angle of the scapulae 2 years ago. At present the patient complains of the staggering while walking, especially during darkness. Objectively: decreasing of the proprioception in both legs is present.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

In a 14 year old patient the paralysis in the left extremities and a loss of deep sensation in the left half of the body and left extremities is observed. Objectively: plegia in the left extremities is present. Tendon reflexes on left side are higher than on the right side. Superficial abdominal reflexes are lost on the left side. The pain and temperature sensation are lost from the level of clavicle and below on the right side.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A patient has been a heavy drinker for the last few years. He has begun to observe the pain and a decreasing of sensation in the arms and legs for the last 2-3 months.

Objectively: A decrease of all types of sensation in the arms and legs according to the type the “socks” and “glows” is present. Ankle jerk reflexes are absent.

- Identify the syndrome.
- Make a topical diagnosis.

### Task

A patient applies to the doctor with a complaint of the attacks of a decreasing sensation, with "creeping" feeling in the right hand, that last during 1-2 minutes. Between attacks the condition of the patient is satisfied. The sensation disorders are not detected by neurological examination.

- Identify the syndrome.
- Make a topical diagnosis.

### Task

A 26 years old female patient applies to the doctor with a complaint of the decrease of the vision sharpness. Objectively: anosmia on the right side is present. Visual acuity is lost in the right eye. An atrophy of the optical nerve in the right eye and papilloedema in the left eye are detected by ophthalmoscopy.

- Identify the syndrome.
- Make a topical diagnosis.

### Task

A 40 year old male patient applies to the doctor with a complaint of transient attacks of unpleasant smell feeling that last for 1-2 minutes. Objectively: left-side quadrant hemianopia is present.

- Make a topical diagnosis.

### Task

A 26 year-old right-handed woman complained of headache and blurred vision for 6 weeks. There was no history of underlying disease nor head trauma. Fundi showed bilateral papilledema. Visual fields were concentrically constricted and her blind spot was enlarged, but acuity was 20/20 (normal) in each eye.

- What is papilledema? What may mimic it?
- What is the differential diagnosis of this case?
- How would you proceed?

### Task

A 63 year-old man presented to the emergency room because he was unable to see objects to his left. This came to his attention when he was sideswiped by a garbage truck in cross-traffic. On examination he had a left homonymous hemianopsia. Saccades could be made in all directions but smooth eye movements were interrupted by frequent saccadic eye movements. The remaining neurological exam was negative.

- What is the course of fibers from retina to occipital lobe?
- What is the significance of:  
Homonymous hemianopia?  
Heteronymous hemianopia?  
Homonymous superior quadrantanopia?
- What is the significance of congruity in a field defect?
- What is the significance of the smooth pursuit defect in this case?

### Task

A 25 year-old woman suddenly notices that her left pupil is larger than her right (5 vs 3 mm).

- What is the pathway mediating the pupillary light reflex?
- What is the differential diagnosis of anisocoria?
- What is a "III-rd nerve palsy"? A "Homer's Syndrome"? What do each signify?

**Task**

A 50 year old patient was hospitalized with complaints of shooting pains in the left part of his face. The attacks last from several seconds to several minutes. The attacks are provoked by chewing, talking, washing, cleaning teeth. On neurological examination no pathology was revealed.

- Make a diagnosis and prescribe treatment.

**Task**

A patient complains of the double vision in the eyes, especially looking laterally. Objectively: the movements in the right eye are totally absent, the right upper eyelid is lowered, the right papilla is wider than the left one. There is loss of photoreaction, accommodation and convergence.

- Identify the syndrome.
- Make a topical diagnosis

**Task**

A 62 year old patient went to a doctor with a complaint of the weakness in the right extremities and a double vision. Objectively: dropping eyelid is present on the left side. Widening of the left papillae, and a strabismus divergence on the left side. On the right side hemiplegia with high muscle tone and tendon reflexes and positive Babinski sign is present.

- Name the syndrome.
- Make a topical diagnosis

**Task**

In a 65 year old female there was a sudden development of the palsy in the right extremities and a double vision. Objectively: strabismus convergence in the left eye is present. The movements of the left eye are limited laterally. Upper motor hemiparesis on the right side is detected.

- Identify the syndrome.
- Make a topical diagnosis

**Task**

In a 48 year old male patient weakness and numbness in the right extremities appeared acutely after the physical overstrain. Objectively: the eyes are turned to the left side. The active movements are limited in the right extremities. The muscle strength is rated as 3/5 scores, the tendon reflexes are increased. Right side hemianesthesia is present.

- Identify the syndrome.
- Make a topical diagnosis

**Task**

A patient has been suffering from a syringobulbomyelia. After the neurological examination the doctor noted the dissociated sensory loss (pain and temperature sensation lost, touch retained) in the lateral face area ("onion skin" pattern). In the central part of the face the sensation was intact.

- Make a topical diagnosis.

**Task**

In a 55 year old female the acute attacks of the pain in the region of the left cheek with irradiation in the left ear appeared. The pain is short, shoots like very intensive, provoked by chewing, speech, swallowing, cooling. The drugs don't help in the moment of the attacks. Objectively: neurological deficit is not found.

- Identify the syndrome.
- Make a topical diagnosis

**Task**

In a 16 year old male suddenly, after the cooling, the face distorted and taste became worse. Objectively: the loss of expression in right half of the face with an inability to close the eyes, to raise

an eyebrow and to frown. There is also a decrease of lacrimation on the right side, increased sensitivity to sound in right ear, reduced sense of taste in two thirds of the right half of the tongue

- Identify the syndrome.
- Make a topical diagnosis

### **Task**

A 46 year old male patient applies to the doctor with complaint of the double vision in the eyes. Objectively : dropping eyelid and widening of the papillae are present on the left side. The left eye is turned outside and downwards.

Make a topical diagnosis

### **Task**

A 50 year-old woman complained of dizziness when turning over in bed. She was otherwise well and without antecedent illness or medical history of note. Exam demonstrated transient torsional-vertical nystagmus after the patient quickly moved her head back with the right ear down.

- Give a general approach to the "dizzy patient". Begin with likely causes of dizziness.
- When is dizziness "vertigo". What are some important etiologies of vertigo?
- What studies can be done to clarify the etiology of vertigo?

### **Task**

A 33 year-old woman slowly developed tinnitus and lost hearing in her left ear over a 2 year period. There were no other reported symptoms. Exam confirmed decreased acuity on the left, with air conduction greater than bone conduction bilaterally, and Weber lateralizing to the right ear. The left corneal reflex was diminished. A mild clumsiness and intention tremor was noted in the left hand.

- What is the differential diagnosis of hearing loss in one ear?
- What neural systems are impaired in this woman? What is the likely diagnosis?

### **Task**

A female patient applies to the doctor with a complaint of the decreasing sharpness of the hearing and presence of the noise in the right ear and dizziness . Objectively: a decrease of sensation in the right half of the face is present. There is loss of the right corneal reflex, right side paralysis of the mimic face muscles, staggering to the right when standing in Romberg's posture and intentional tremor during a finger-to-nose test on the right side.

- Name the syndrome.
- Make a topical diagnosis.

### **Task**

A 12 year old patient complains of the decreasing sharpness of the hearing and presence of the permanent noise in the left ear and transient dizziness that are accompanied by nausea and staggering while a walking. Objectively hypoakusia on the left side, nystagmus and staggering the left in Romberg's posture are present..

- Name the syndrome.
- Make a topical diagnosis.

### **Task**

A 12 year old patient complains of the decreasing sharpness of the hearing and presence of the permanent noise in the left ear and transient dizziness that are accompanied by nausea and staggering while a walking. Objectively hypoakusia on the left side, nystagmus and staggering the left in Romberg's posture are present..

- Name the syndrome.
- Make a topical diagnosis.

### **Task**

A 12 year old child has been suffering from diphtheria. On the 15-d day of the disease disturbances during swallowing, “nasal tone” and hoarseness of the voice appeared,. Objectively: excursion of the palatine during the phonation is limited, palatine and pharyngeal reflexes are lost, tachycardia is present.

- Diagnose the syndrome.
- Make a topical diagnosis.

### **Task**

In a 43 year old patient the disorder of the swallowing, slurred speech and loss of sonority of voice appeared during the last 2 months. Objectively: palatal movement is absent on the right side, gag reflex is absent on the same side, dysphagia, dysphonia, dysarthria are present. The protruded tongue is deviated to the right side , a right half of the tongue is wasted and wrinkled.

- Diagnose the syndrome.
- Make a topical diagnosis.

### **Task**

A male presents with fever, headache and neck and arm weakness. 2 weeks ago he worked in the forest and removed the tick from the neck . In 7 days flu-like symptoms developed and 8 days later the weakness occurred. Objectively: flaccid paresis of the neck extensors with his head hanging on his chest is present as well as the flaccid paresis of shoulder girdle muscles. The patient can not raise the arms above the horizontal line; the head hangs on the chest.

- Make a topical diagnosis.

### **Task**

A 59 y/o right-handed man was brought to the emergency room because of sudden onset of disturbance of speech. On examination, he spoke spontaneously and excessively but conveyed little meaning. There are paraphrasias and neologisms. He could carry out only very simple instructions. Naming, repetition, and reading are impaired.

- 1/ Identify the syndrome
- 2/ Make a topical diagnosis
- 3 Describe Broca's vs. Wernicke's aphasia & usual lesion site.

### **Task**

A 50 year old patient was hospitalized to the emergency . At work he had a transient loss of consciousness

Objectively high arterial pressure was registered. The level of consciousness was normal. The comprehension of the addressed speech was intact and the patient carried out primitive instructions (such as “Shake the hand”). At the same time the patient couldn’t not answer the questions and only pronounced the sounds “ yea-yea”.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 30 year old female patient has been suffering from a rheumatic heart valve defect . The relatives said that this disorder had an acute onset. Objectively: he didn’t follow the instructions, couldn’t not show the parts of his body by request and didn’t differentiate the phonemes. The speech was fluid, but the words were not understandable. The speech was so disorganized that it made no linguistic or grammatical sense (“words salad”).

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A patient noted difficulties in reading, (forgot letters) and oral account. Objectively: he is not able to recognize objects by touch with his right arm. He laces up the shoes with difficulty, makes mistakes in counting, and forgets letters.

- Identify the defect of mental functions.
- Make a topical diagnosis

### **Task**

A female patient, a pianist, noted difficulties in playing in quick temp. At the same time the disturbances of the speech developed. Now she is not able to pronounce long words and makes mistakes in writing.

- Identify the movements and speech disorders

### **Task**

A 14 year old patient. The parents noted behavioral disturbances: foolishness, untidiness, a decrease of the memory. Objectively: the patient is disinhibited, doesn't follow the instructions quickly, repeats the words after the doctor, makes stereotypic movements.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

In a 59 old male patient speech disorders and weakness in the right extremities (more in the arm) developed suddenly. Objectively: the range of active movements is limited in the right extremities. Barre test is positive on the right side, more in the arm. The muscle tone is increased in the flexors muscles of the right arm and in the extensors muscles of the right leg. The tendon reflexes on the right side are increased. Babinski sign is positive on the right side. The motor aphasia is present.

5. Determine the syndrome
6. Make a topical diagnosis

### **Task**

A 30 year old female patient . Last year her behavior changed. The patient became untidy and tended to feeble jokes. Deterioration of vision developed. Objectively: there are left optic disc atrophy, papilledema in the right eye and left side anosmia. The speech of the patient is slow and inexpressive.

5. Diagnose the syndromes.
6. Make a topical diagnosis.

### **Task**

A 38 year old male patient applies to the doctor with a complaint of the short transient unpredictable attacks of sensation of rotation of the surrounding objects, unpleasant smell and unusual taste. Objectively: upper right side quadrant hemianopia, instability in Romberg posture with deviation to the right.

- Identify the syndrome.
- Make a topical diagnosis.

### **Task**

A 43 year old female patient complains of the periodical transient unpleasant sensation of flashes, luminous points, flame in front of the eyes. The forms of the known objects become distorted for a second or two, then go back. At the same moment face recognition is broken. Objectively: visual acuity is 1, 0. Right side quadrant hemianopia is present.

- Identify the syndromes.
- Make a topical diagnosis.

### **Task**

A 30 year old male patient is an engineer in occupation. The patient applies to the doctor with a complaint of the difficulty performing actions (incorrect button up, difficulty in closing the door with the key); loss of the ability to calculate and to read. Objectively: can't recognize the known objects by touch and by grasping them. He isn't able to name his fingers, to calculate, to read text, to dress independently.

- Identify the syndromes.
- Make a topical diagnosis.

### **Task**

In a 57 old male patient acute weakness and numbness in the right extremities developed after the emotional stress. Objectively: right side hemianopia is present, the right angle of the mouth is lowered, protruded tongue is deviated to the right. Right side hemiparesis (with the increased muscle tone, high tendon reflexes and positive Babinski sign) is present as well as loss of all types of sensation in a right side of the body.

- Identify the syndromes.
- Make a topical diagnosis.

### **Task**

A 60 year old male patient complains of burning pain in the right half of the body and in the right extremities, unsteady gait. Objectively: right side hemianopia; right side hemihypesthesia; deviation to the right when walking. The right hand is flexed in the carporadial joint, it's fingers periodically involuntarily squeezed to each other or fixed in the abnormal, pretentious postures, that are quickly changed .

- Diagnose the syndromes.
- Make a topical diagnosis.

### **Task**

The few last years a female patient complains of the involuntary twitching in the extremities and in different parts of the body, that disturbed the purposeful voluntary movements. Objectively: fast, arrhythmic, violent, chaotic, systemic loss of movements in extremities, body trunk, muscles of the face; the patient can not fix the protruded tongue and extremities at rest.

- Diagnose the syndromes.
- Make a topical diagnosis.

### **Task**

In a 49 old male patient the paralysis in the right extremities and a drooping of the upper left eyelid developed acutely after the bath with hot steam. Objectively: strabismus divergence and ptosis on the left side. The left pupil is wider than the right one. The right angle of the mouth is lowered. The deviation of the tongue is present on the right side. There is loss of movements on the right side. Tendon reflexes and muscle tone are higher on the right- side than on the left. Hemihypesthesia on the right side is present.

- Define the syndromes.
- Make a topical diagnosis.

### **Task**

In a 66 year old patient distortion of the right side of face and loss of movements in the left extremities developed suddenly in the morning. Objectively: inability to close the right eye is present. The wrinkles of the forehead are lost on the right side. The right angle of the mouth is lowered. There is also deviation of the tongue to the left side and left -side hemiparalysis with high tendon reflexes and Babinski sign .

- Define the syndromes
- Make a topical diagnosis

### **Task**

In a patient paralysis in the right extremities, the deviation of the face and double vision developed acutely. Objectively: strabismus convergence in the left eye, inability to close the left eye, the loss of wrinkles of the forehead on the left side, lowering of the left angle of the mouth, hemiparalysis on the right side with high tendon reflexes and Babinski sign, hemihypesthesia on the right side are present.

- Define the syndromes.
- Make a topical diagnosis.

### **Task**

In a 66 old male patient, paralysis on the left extremities and disturbances of the speech gradually developed. Objectively: the protruded tongue deviated to the right side. The atrophy of muscles of a right half of the tongue is present. Articulation is disturbed. Active movements are absent in the left extremities. Tendon reflexes are increased and Babinski reflex is positive on the left side.

- Define the syndromes.
- Make a topical diagnosis.

### **Task**

In a 46 old female patient in the last few months the weakness in the left extremities and disturbances of the voice (“nasal tone”) gradually has developed. Difficulties in the swallowing have appeared. Objectively: the protruded tongue deviates to the right side, the voice is voiceless. The speech is with the nasal tone. The right half of the palatine is paralyzed, the gag reflex is absent on the right side. The muscle strength is decreased in the left extremities, tendon reflexes are increased in the left extremities. Babinski sign is positive on the left side.

- Define the syndromes.
- Make a topical diagnosis.

### **Task**

In a 17 old male patient acute the paralysis in all extremities and the disturbance of the respiration developed immediately after diving upside down into the pool. Objectively: tetraplegia. The sensation is preserved only in the face and in the parietal region of the head. Respiratory failure is present.

- Define the syndrome.
- Make a topical diagnosis.

### **Task**

In a 10 old male patient the paralysis of arms and legs and disturbances of the micturition developed after the road accident.

Objectively: active movements in the extremities are absent; tendon reflexes in the arms are lost, the superficial abdominal reflexes are absent, tendon reflexes in the legs are increased, feet and kneecap clonus are observed Bilateral pathological pyramidal signs are positive in legs. There is a sensory loss below the C6 level a sensory loss below the C6 spinal segment. The delay of the micturition is present.

- Define the syndrome.
- Make a topical diagnosis.

### **Task**

In a 37 old male patient the weakness in the lower extremities and disturbances of the micturition have gradually developed during the last year,. Objectively: loss of muscle tone, motor function, reflex activity and somatic sensation below a thoracic level.

- Define the syndrome.
- Make a topical diagnosis.

### **Task**

A female patient complains of the pain in the lower back, difficulty walking, numbness in the inner thighs, legs and feet, lack of bladder control; rectal [incontinence](#).

Objectively: motor weakness and partial sensory loss in both legs, and saddle anesthesia (sensory loss in the sacral and coccygeal segments).

- Define the syndrome.
- Make a topical diagnosis.

### **Task**

A 43-year-old woman describes lancinating pains radiating into the right side of her jaw. This discomfort has been present for more than 3 years and has started occurring more than once a week. The pain is paroxysmal and routinely triggered by cold stimuli, such as ice cream and cold drinks. She has sought relief with multiple dental procedures and has already had two teeth extracted. Multiple neuroimaging studies reveal no structural lesions in her head. Assuming there are no contraindications to the treatment, what will you prescribe her?

### **Task**

A patient with diabetes mellitus complains of numbness and tingling in feet. Objectively: all sensory modalities are decreased in a stocking-glove pattern. Ankle reflexes are lost.

- Define the syndrome.
- Make a topical diagnosis.

### **Task**

A patient complains of numbness and tingling in hypothenar region of palm, along the little finger and ulnar half of the ring finger, associated with a weakness of small finger. Objectively: partial clawing of the ring and little finger (hyperextension at the metacarpophalangeal joints and flexion of the interphalangeal joints) and wasting of the small muscles of the hand. Tapping over the cubital tunnel causes pain.

- Define the syndrome.
- Make a topical diagnosis.

### **Task**

A patient complains of pain at the wrist and numbness and tingling in the hand, particularly during the use of the hand with forced flexion or extension at the wrist. Neurological examination: sensory loss in the first three digits and the radial half of the fourth digit. Weakness of thumb abduction and opposition. Thenar atrophy

- Name the syndrome.
- Make a topical diagnosis.

### **Task**

A patient complains of “drooping” of the wrist and fingers and “inability to use the hand” (inability to extend the wrist and fingers). He noticed this disorder in the morning after a long sleep. Neurological examination: weak wrist extension, and weak extension of all digits is present. There is no sensory findings.

- Name the syndrome.
- Make a topical diagnosis.

### **Task**

A patient complains of sensory loss on the ventral thigh, buckling of the knee (on uneven surfaces) and falls (leg “collapses”). Objectively: atrophy and weakness of quadriceps muscles. Knee reflex is absent. Sensory loss over anterior aspect of thigh and medial side of lower leg.

- Name the syndrome.
- Make a topical diagnosis.

### **Task**

A patient complains of left foot drop that leads to falls. Objectively: weakness of extension (“dorsiflexion”) of left foot and toes. Decreased sensation in the dorsum of the foot.

- Identify the syndrome.
- Make a topical diagnosis.

### Task

In a 10-year-old child a weakness and loss of sensation in the right arm developed after the clavicle injury. Objectively: Weakness of proximal and distal muscles of right arm, including levator scapulae and serratus anterior. Complete sensory loss in affected arm with pain. Horner- Clod Bernard syndrome is positive on the right side

- Make a topical diagnosis.

### Task

A 72 year old woman was hospitalized with speech disorder, weakness in both her arm and leg and paralysis of a gaze. The disease began suddenly when she woke up in the morning. During last week she had two attacks of transient monocular blindness, which lasted for a few seconds.

Objectively: The level of consciousness was normal, but the woman could not speak. Her face was pale, blood pressure was 180/100 mm Hg, pulse was arrhythmical. There was motor aphasia, conjugate gaze deviation to the left, right side hemiparesis and positive Babinsky's sign.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

### Task

A 45 year old man was admitted to clinic. His level of consciousness was reduced, with GCS =10. He had severe headache, vomiting and weakness in both his arm and leg. The disease has developed suddenly after emotional overstrain. Also the patient has been suffering from hypertension for a long time.

Objectively: the patient's face is red. His blood pressure is 220/120 mm Hg, and his pulse is 60 beats per minute. Neck muscles rigidity is about 3 cm, Kerning symptom is positive at an angle of 100°. The left pupil is dilated and right side hemiparesis and hemyhyposthesia are observed.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

### Task

A 35 year old man was admitted to the emergency room with confused state. The disease had an acute onset. It began suddenly with a very severe headache, after which the disturbance of consciousness and vomiting developed.

Objectively: there is delirium, neck muscles rigidity of 5 cm, Kerning's symptom. Focal neurologic symptoms are absent.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?

### Task

How would you comment the following CSF?

- Pleocytosis is 120/mm<sup>3</sup>
- Lymphocytes are 100/ mm<sup>3</sup>
- Polymorphonuclear leukocytes are 20/ mm<sup>3</sup>
- Proteins are 1.66 g/L
- Sugar content is 20 mg/dL
- CSF is cloudy with clots.

### Task

How would you comment the following CSF?

- CSF pressure is 400 mm H<sub>2</sub>O
- The CSF is cloudy and of yellow-green color
- Cytosis is 2000/ mm<sup>3</sup> ; polymorphonuclear leukocytes (neutrophils) are prevailed
- Protein is 5,6 g/L
- Sugar content is 20 mg/dL.

### Task

A 36 year old woman was hospitalized with severe headache and weakness in both her left arm and leg. Disease has been developing gradually for 2 weeks. The woman has chronic infection in the middle ear.

Objectively: the patient is confused; body temperature is 38,9°. Left side spastic hemiparesis and papilledema are present.

Laboratory blood tests: the cell count and erythrocyte sedimentation rate are elevated.

The brain precontrast CT scan reveals an area of higher density than the surrounding edematous brain in the right frontal lobe. The contrast CT study demonstrates rim enhancing lesion with thickened capsule and hypodense central cavity.

- What is the diagnosis
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### Task

A 20 year old female complains of fever, chills, severe headache, nausea and vomiting. The onset of disease was acute

Objectively: level of consciousness is altered (GCS = 13). The body temperature is 39°C. There are petechiae on the skin. Fast pulse, shortness of breath and stiffness of neck muscles are present. Kernig's sign is positive.

- What is an preliminary diagnosis?
- What laboratory data are needed for the final diagnosis?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### Task

A 22 year old male patient has been suffering from weakness, irritability, headache, fever, vomiting and insomnia for 8 days. The last 2 days the visual acuity decreased and double vision appeared.

Objectively: body temperature is 37,8°C. Stiffness of neck muscles, positive Kernig's signs, incomplete bilateral ptosis, dilatation of both pupils and slight strabismus divergent are observed.

- What is a preliminary diagnosis
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### Task

**What structures of the brain and the spinal cord are not impaired by multiple sclerosis?**

- cranial nerves nuclei
- white matter of the brain in paraventricular localization
- peduncles of cerebellum
- spinal cord white matter
- corpus callosum

**Task**

**Which of the following CSF findings is least suggestive of acute multiple sclerosis?**

- an IgG index greater than 1.7
- increased myelin basic protein
- increased protein to 200 mg/dL
- presence of oligoclonal bands
- slight to moderate monocytic pleocytosis

**Task**

**Which of the following signs or symptoms occurring in a young person is the most suggestive of multiple sclerosis?**

- bilateral internuclear ophthalmoplegia
- gait ataxia
- Lhermitte's sign
- optic neuritis
- vertigo

**Task**

**Persons migrating from a zone with high risk of multiple sclerosis (MS) to one of low risk after age 15 show a risk of developing MS that is**

- equal to that of the high-risk zone
- equal to that of the low-risk zone
- intermediate between the two zones
- lower than that of the low-risk zone
- unpredictable

**Task**

**A 21-year-old right-handed female student was working in the photography lab 1 week ago, which required standing all day. After that, she experienced a cold sensation in the left foot and her entire left leg fell asleep. The feeling lasted 4 to 5 days and then slowly went away. Her right lower extremity was fine. Coughing, sneezing, and the Valsalva maneuver did not worsen her symptoms. She had a slight back pain, which she thought was due to using a poor mattress. Past history includes an episode of optic neuritis in the left eye 2 years ago. At that time, she was reportedly depressed and was sleeping constantly. One day, her left eye became blurred and her vision went out. In 1 week, her vision returned to normal.**

**Her vision now is 20/20. She has not had a repeat episode since then. She had an MRI of her brain, which was normal at that time. She drinks alcohol occasionally and does not use any illicit drugs. Her only medication is birth control pills. Examination is significant for brisk reflexes and sustained clonus at the right ankle. Babinski sign is present on the right. Testing is positive for oligoclonal bands. Which of the following is the most likely diagnosis in this case?**

- Seizure
- Transient ischemic attack
- Anaplastic astrocytoma
- Multiple sclerosis
- Parkinson's disease

**What further examination is needed?**

**What results of examination are expected?**

**Task**

**A patient has brought some test results from an outside doctor with her today. One of the results indicates that oligoclonal bands were positive. What are oligoclonal bands?**

- Wave frequency changes on the EEG during sleep
- Markings about the iris
- Pathologic features of Alzheimer's disease

- Chromosomal markings found with multiple sclerosis
- Immunoglobulin patterns in the cerebrospinal fluid with multiple sclerosis

### Task

**A 19-year-old man had an episode of left optic neuritis, which resolved over several weeks. Two years later there was a month long episode of bladder dysfunction. The patient underwent many tests and was told that he had multiple sclerosis. The cerebrospinal fluid in persons with multiple sclerosis will typically exhibit which of the following?**

- Glucose content of less than 20% of the serum content
- Persistently elevated total protein content
- Persistently elevated immunoglobulin G (IgG) content
- Mononuclear cell counts of greater than 100 cells per  $\mu\text{L}$ 
  - Erythrocyte counts of greater than 10 cells per  $\mu\text{L}$

### Task

A 25 year old male patient has been suffering from chronic lymphadenopathy, weight loss, fever, and diarrhea for 2 months. Recently apathy, indifference, reduction of libido, poor concentration and memory impairment have developed.

Examination has revealed slight manifestation of Parkinsonism and ataxic gait.

- What preliminary diagnosis would you make?
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### Task

**A 9-year-old boy is brought to your clinic by his parents because he has begun to have episodes of eye fluttering lasting several seconds. Sometimes he loses track of his thoughts in the middle of a sentence. There was one fall off a bicycle that may have been related to one of these events. There are no other associated symptoms, and the episodes may occur up to 20 or more times per day. The boy's development and health have been normal up until this point. He did have two head injuries as a young child: the first when he fell off a tricycle onto the ground, and the second when he fell off of a playset onto his head. Both episodes resulted in a brief loss of consciousness and he did not think clearly for part of the day afterward, but had no medical intervention. Which of the following tests is most likely to confirm this patient's diagnosis?**

- Brain CT scan
- Brain MRI
- Electroencephalogram
- Lumbar puncture
- Nerve conduction study

### Task

**A 19-year-old right-handed man who carries the diagnosis of epilepsy is seen in the urgent care clinic. He had been healthy until about age 12, when he began to have episodes of eye fluttering lasting several seconds. Sometimes he would lose track of his thoughts in the middle of a sentence. There was one fall off of a bicycle that may have been related to one of these events. He has been treated with valproic acid. At one point he was off all medications, but the seizures returned. He is now at the end of his first semester of college and came in today because he had a witnessed generalized tonic-clonic seizure this morning. He had had only about 2 hours of sleep the night before because he was studying for a final exam. Which of the following is the most appropriate thing to tell this patient?**

- “I know that you faked this seizure to avoid taking a test.”
- “Lack of sleep may have contributed to triggering this seizure.”
- “You can expect to have tonic-clonic seizures on a regular basis from now on.”
- “Your seizures are getting worse and there is nothing we can do about it.”
- “You should take the next semester off to recover and get extensive testing.”

### Task

**A 56-year-old man with epilepsy is brought into the emergency room. He has been having continuous generalized tonic-clonic seizures for the past 30 min. He is treated with 2 mg of intravenous lorazepam. Most physicians recommend using a high dose of intravenous benzodiazepine as part of the management of status epilepticus because it has which of the following qualities?**

- Ability to suppress seizure activity for more than 24 h after one injection
- Lack of respiratory depressant action
- Rapid onset of action after intravenous administration
- Lack of hypotensive effects
- Lack of dependence on hepatic function for its metabolism and clearance
- 

### Task

**A 44-year-old man presents with left arm shaking. Two days ago, the patient noticed left arm paresthesias along the lateral aspect of his left arm and left fourth and fifth fingers while he was reading. He thinks he may have been leaning on his left arm at the time; the symptoms resolved after 30 seconds. This morning, he noted the same feelings, lasting a few seconds, but then his fourth and fifth fingers started shaking rhythmically, and the shaking then spread to all of his fingers, his hand, and then his arm up to his elbow. This episode lasted a total of 30 seconds. He denies any strange smells or tastes, visual changes, or weakness. Afterward, his fingers felt locked in position for a few seconds. Then he felt as if he did not have control of his hand and had difficulty donning his socks. He and his wife decided to drive to emergency room, and in the car he had trouble putting his seat belt latch into its socket. Examination and routine labs are normal. Which of the following is the most appropriate next action?**

- Discharge the patient to follow up in clinic in 2 weeks
- Obtain a brain MRI
- Obtain an electroencephalogram
- Obtain an orthopedic consult
- Order electromyography and nerve conduction studies

### Task

**A 4-year-old boy has the onset of episodes of loss of body tone, with associated falls, as well as generalized tonic-clonic seizures. His cognitive function has been deteriorating. EEG shows 1.5- to 2-Hz spike-and-wave discharges. Which of the following is the most likely diagnosis?**

- Landau-Kleffner syndrome
- Lennox-Gastaut syndrome
- Juvenile myoclonic epilepsy
- Mitochondrial encephalomyopathy
- Febrile seizures

### Task

**A 27-year-old man begins to experience infrequent episodes of nausea, warmth rising through his body, and an unusual odor like rotting fish. His girlfriend notices that afterward he may develop twitching of the left side of his face and an inability to speak for several minutes. Afterward the man appears dazed and cannot remember what has occurred. He has otherwise been well. Magnetic resonance imaging of his brain is most likely to show a lesion in which of the following areas?**

- Left occipital lobe
- Right frontal lobe
- Cribriform plate
- Uncus
- Left parietal lobe

#### Task

**A 29-year-old man with a history of febrile seizures as a child has developed medication refractory focal seizures with impaired awareness within the past 2 years. An MRI reveals the small volume abnormality in the left temporal lobe. Which of the following is true regarding this condition?**

- This patient may benefit from a neurosurgical procedure
- The patient will probably die within 2 years
- The seizures will most likely stop with further medication titration
- A head CT should be performed
- A cerebral angiogram may confirm the diagnosis

#### Task

**A 37-year-old man develops involuntary twitching movements in his left thumb. Within 30 s, he notices that the twitching has spread to his entire left hand and that involuntary movements have developed in his left forearm and the left side of his face. He cannot recall what happened subsequently, but his wife reports that he fell down and the entire left side of his body appeared to be twitching. He appeared to be unresponsive for about 3 min and confused for another 15 min. During the episode, he bit his tongue and wet his pants. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic seizures
- Absence
- Focal seizure with impaired awareness
- Focal aware sensory seizure
- Jacksonian march

#### Task

**A 17-year-old boy reports involuntary jerking movements in his arms when he awakens. This has occurred during the day after a nap as well as in the morning after a full night's sleep. Over the next few months, he developed similar jerks during the day, even when he had been awake for several hours. He did not lose consciousness with these muscle jerks, but did occasionally fall. On one occasion, jerks in his legs caused a fall that resulted in a fractured wrist. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic seizures
- Absence
- Focal aware seizure
- Epilepsia partialis continua
- Myoclonic

#### Task

**A 21-year-old man reports several episodes over the previous 4 years during which he lost consciousness. He had no warning of the impending episodes, and with each episode he injured himself. Observers told him that he abruptly developed a blank stare and stopped talking. His body became stiff and he arched his back. After several seconds of this type of posturing, his arms and legs started shaking violently. During one of these episodes, he dislocated his right shoulder. He routinely bit his tongue and urinated in his pants during the episodes. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Generalized absence

- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Focal aware sensory seizure

### Task

**A 25-year-old woman was fired from her job after she misplaced papers vital for the company. She had had recurrent episodes for several years during which she performed nonsensical activities such as burying her plates in the backyard, hiding her underwear, and discarding her checkbook. She did not recall what she had done after performing these peculiar activities. She had been referred for psychotherapy, but the episodes became even more frequent after she was started on thioridazine (Mellaril). Her husband observed one episode and noted that she was unresponsive for about 5 min and confused for at least 1 h. She did not fall down or remain immobile during the episodes. As the episodes became more frequent, she noticed that she would develop an unpleasant taste in her mouth, reminiscent of motor oil, just before an episode. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Myoclonic

### Task

**A 21-year-old cocaine-abusing man develops seizures that persist for more than 30 min before emergency medical attention is available. When examined nearly 1 h later, he is still exhibiting tonic-clonic movements and has never recovered consciousness. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Generalized absence
- Jacksonian march
- Tonic-clonic status epilepticus

### Task

A 38-year-old patient has been suffering from morning headache for a year. The headache decreases at daytime. During the last months the headache became severe and vomiting appeared. Over the last few weeks the weakness the left extremities developed.

Objectively: papilledema and left-side hemiparesis are observed.

- Make an initial diagnosis. What is the future examination.

### Task

The patient is a 45-year-old man. Relatives noticed the changes in his behavior: inappropriate humor, impaired ability to judgments, gait abnormalities and urinary incontinence. The patient complains of constant headache and vomiting which begins each morning before he rise from bed.

Objectively: inappropriate behavior, loss of smell sense and papilledema were revealed. Gait was noticed to be without any signs of cerebellar ataxia.

- What clinical syndromes may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis ? Justify your decision

### Task

The 48-year-old woman complains of headaches, fatigue, muscular pains, vision disturbances and amenorrhea. She notes that she is not able longer to put on rings that used to fit and that her shoe size has progressively increased.

Objectively: enlarged hands and feet, prominent supraorbital ridges, protruded mandible, separated teeth and thick lips, enlarged tongue. Bitemporal hemianopsia.

- Make an preliminary diagnosis.
- Explain the pathophysiological mechanism of bitemporal hemianopsia
- What examinations are necessary to verify a diagnosis?

### **Task**

The 46-year-old woman has been suffering from progressive unilateral right side loss of hearing for two years. Tinnitus, unstable gait and systemic dizziness appeared half a year ago. Facial numbness and facial weakness developed two weeks ago.

Objectively: papilledema, nystagmus, right side deafness, facial weakness on the right side, intentional tremor and ataxic gait were observed.

- What clinical syndromes may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### **Task**

A 45-year-old woman complains of pain and paresthesias in the left side of the thorax and weakness in the left leg. Pain appeared two months ago. Her doctor made a diagnosis of “osteochondrosis” and prescribed anti-inflammatory drugs and physiotherapy. However, pains were growing worse, aggravating at coughing, sneezing and movements of the trunk. The pains were unbearable when the woman was lying down. Last week weakness in her left leg appeared.

Objectively: left leg weakness associated with spasticity, high tendon reflexes and positive Babinsky’s symptom was revealed. Decreased pain sensation from the right rib arc to the heel and decreased proprioceptive sensation in the left leg were also observed. Tenderness when tapped over the Th6 spinous process was present.

- What clinical syndrome may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### **Task**

The patient is a 45-year-old man. He complains of severe pain, numbness and tingling in the buttocks and legs, weakness in legs, and incontinence of bladder and bowels.

These disorders evolved slowly during last 4 months.

Objectively: asymmetric flaccid paraplegia in legs, absence of both ankle and knee jerks, loss of sensation in L4-S5 dermatomes (in lower extremities and an anogenital area) are observed.

- Make an initial diagnosis and prescribe examination and treatment.
- What are the major types of neurogenic bladder?

### **Task**

The patient is a 35 year old driver. He suffered from recurrent back pain for 4 years. 3 days ago he felt acute pain in the lower part of his back after lifting an heavy object. Pain irradiated to his right leg. Pain becomes worse when coughing and sneezing.

Objectively: the movements in the lumbar area are limited because of pain. Knee jerk reflexes are intact, left ankle jerk reflex is present, but the right one is absent. Reduction of muscle power of the right foot flexors is observed. Sensitivity of the lateral parts of the right foot and shin is decreased.

Make a diagnosis and prescribe the treatment for this patient.

### **Task**

A 25 year old man was admitted 15 minutes ago. He got a blow on his face and lost consciousness for 2-3 minutes. When he regain his consciousness he couldn't understand what had happened. Now he complains of headache and nausea.

Objectively: pallor of the face, sweating of palms, postural tremor of fingers and instability in Romberg's test are observed.

- Make an initial diagnosis and prescribe examination.

### **Task**

A 30 year old woman was hospitalized 2 hours after the accident. She was unconscious for 15 minutes after the trauma. Then she began to understand what she was asked about and became able to answer the questions, but was sleepy.

Objectively: perforation of the right tympanic septum and Bell's palsy were revealed.

Make an initial diagnosis and prescribe examination and treatment.

### **Task**

The patient is a 55 year old woman. A week ago she fell down and damaged the back of the head. After that a headache and vomiting developed. Then she felt satisfactory for three days. But the day before yesterday headache appeared again and became more severe. The woman was not able to go to work yesterday. And today she has been taken to hospital by her relatives.

The examination showed the following: low level of consciousness (CGS = 10), widening of the right pupil, bradycardia and left side hemiparesis with Babinsky's sign.

- Make a primary diagnosis and prescribe examination and treatment.

### **Task**

A 32 year-old woman complains of pain in her back and left leg. Three weeks earlier, while standing on a ladder to change a light bulb, she suddenly felt a pain in her left thigh. Later, sharp shooting pain spread down along the posterior side of the left leg to a heel.

Pain was worsened by sitting and standing. Weakness and numbness were denied. There were no sphincter symptoms. There was no history of trauma.

- What nerve(s) and roots are implicated in this woman's pain?
- Where weakness might be expected? What reflex might be lost?
- What are the "danger" symptoms of back pain which would argue for MRI and possible early surgery?
- Give a few etiologies for low back pain.

### **Task**

A 28 year old patient fell asleep after alcohol abuse. When he woke up, he felt weakness in his left hand.

Objectively: radial deviation of the hand, weak wrist extension, weak extension of all digits, normal sensory findings are observed.

- Make a diagnosis and prescribe the treatment.

### **Task**

A 56-year-old female was hospitalized with complaints of burning pain in shins and feet. For last five years she periodically felt thirsty, suffered from hunger and fatigue.

Objectively: loss of both superficial and deep sensations of the stocking type and absence of ankle reflexes. Systolic blood pressure falls down to 30 mm Hg. when she changes her position from horizontal to vertical one.

- 2) Make a diagnosis and prescribe the treatment.

### **Task**

A 6 year-old boy presents to clinic for evaluation of "he straddles when he stands and waddles when he walks". These abnormalities were first noted about 2 years ago, but he walked late. He has

pelvic and shoulder weakness but his calves appear hypertrophic. His brother, 2 maternal first cousins, and a maternal uncle all died after becoming wheel chair bound.

- What is the inheritance pattern exhibited in this pedigree?
- What is the clinical difference between Duchenne and Becker muscular dystrophy?
- Why are women only rarely affected with Duchenne's? How can the carrier status of an at risk female be determined?
- What is dystrophin?
- In the 1990s how could the clinical diagnosis of Duchenne's muscular dystrophy be confirmed most reliably?

### **Task**

A 35-year-old female presented with complaints of intermittent diplopia and ptosis, worse at the end of the day, for the last year. The diplopia fluctuated between horizontal, vertical and diagonal. She described her left eye as "lazy," and stated it had been getting progressively worse. Upon questioning, she complained of generalized muscle weakness, difficulty swallowing and breathing for the last three months.

1. List key signs and symptoms associated with systemic myasthenia gravis.
2. What history questions should one ask every patient suspected of having myasthenia gravis?
3. Describe the diagnostic tests for myasthenia gravis.
4. What are the classes of medication used to treat myasthenia gravis?
5. Describe the mechanism of action of the pharmaceutical agents involved in the treatment of myasthenia gravis.
6. What medications should be avoided in patients with myasthenia gravis?

### **Tasks for the assessment of competence "UC-4":**

### **Task**

A 72 year old woman was hospitalized with speech disorder, weakness in both her arm and leg and paralysis of a gaze. The disease began suddenly when she woke up in the morning. During last week she had two attacks of transient monocular blindness, which lasted for a few seconds.

Objectively: The level of consciousness was normal, but the woman could not speak. Her face was pale, blood pressure was 180/100 mm Hg, pulse was arrhythmical. There was motor aphasia, conjugate gaze deviation to the left, right side hemiparesis and positive Babinsky's sign.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

### **Task**

A 45 year old man was admitted to clinic. His level of consciousness was reduced, with GCS =10. He had severe headache, vomiting and weakness in both his arm and leg. The disease has developed suddenly after emotional overstrain. Also the patient has been suffering from hypertension for a long time.

Objectively: the patient's face is red. His blood pressure is 220/120 mm Hg, and his pulse is 60 beats per minute. Neck muscles rigidity is about 3 cm, Kerning symptom is positive at an angle of 100°. The left pupil is dilated and right side hemiparesis and hemihyposesthesia are observed.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

### **Task**

A 35 year old man was admitted to the emergency room with confused state. The disease had an acute onset. It began suddenly with a very severe headache, after which the disturbance of consciousness and vomiting developed.

Objectively: there is delirium, neck muscles rigidity of 5 cm, Kerning's symptom. Focal neurologic symptoms are absent.

- Make an preliminary diagnosis
  - What examinations are necessary to verify a diagnosis?

### Task

How would you comment the following CSF?

- Pleocytosis is  $120/\text{mm}^3$
- Lymphocytes are  $100/\text{mm}^3$
- Polymorphonuclear leukocytes are  $20/\text{mm}^3$
- Proteins are 1.66 g/L
- Sugar content is 20 mg/dL
- CSF is cloudy with clots.

### Task

How would you comment the following CSF?

- CSF pressure is 400 mm H<sub>2</sub>O
- The CSF is cloudy and of yellow-green color
- Cytosis is  $2000/\text{mm}^3$ ; polymorphonuclear leukocytes (neutrophils) are prevailed
- Protein is 5,6 g/L
- Sugar content is 20 mg/dL.

### Task

A 36 year old woman was hospitalized with severe headache and weakness in both her left arm and leg. Disease has been developing gradually for 2 weeks. The woman has chronic infection in the middle ear.

Objectively: the patient is confused; body temperature is  $38,9^\circ$ . Left side spastic hemiparesis and papilledema are present.

Laboratory blood tests: the cell count and erythrocyte sedimentation rate are elevated.

The brain precontrast CT scan reveals an area of higher density than the surrounding edematous brain in the right frontal lobe. The contrast CT study demonstrates rim enhancing lesion with thickened capsule and hypodense central cavity.

- What is the diagnosis
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### Task

A 20 year old female complains of fever, chills, severe headache, nausea and vomiting. The onset of disease was acute

Objectively: level of consciousness is altered (GCS = 13). The body temperature is  $39^\circ\text{C}$ . There are petechiae on the skin. Fast pulse, shortness of breath and stiffness of neck muscles are present. Kernig's sign is positive.

- What is an preliminary diagnosis?
- What laboratory data are needed for the final diagnosis?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### Task

A 22 year old male patient has been suffering from weakness, irritability, headache, fever, vomiting and insomnia for 8 days. The last 2 days the visual acuity decreased and double vision appeared.

Objectively: body temperature is 37,8°C. Stiffness of neck muscles, positive Kernig's signs, incomplete bilateral ptosis, dilatation of both pupils and slight strabismus divergent are observed.

- What is a preliminary diagnosis
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

#### **Task**

**What structures of the brain and the spinal cord are not impaired by multiple sclerosis?**

- cranial nerves nuclei
- white matter of the brain in paraventricular localization
- peduncles of cerebellum
- spinal cord white matter
- corpus callosum

#### **Task**

**Which of the following CSF findings is least suggestive of acute multiple sclerosis?**

- an IgG index greater than 1.7
- increased myelin basic protein
- increased protein to 200 mg/dL
- presence of oligoclonal bands
- slight to moderate monocytic pleocytosis

#### **Task**

**Which of the following signs or symptoms occurring in a young person is the most suggestive of multiple sclerosis?**

- bilateral internuclear ophthalmoplegia
- gait ataxia
- Lhermitte's sign
- optic neuritis
- vertigo

#### **Task**

**Persons migrating from a zone with high risk of multiple sclerosis (MS) to one of low risk after age 15 show a risk of developing MS that is**

- equal to that of the high-risk zone
- equal to that of the low-risk zone
- intermediate between the two zones
- lower than that of the low-risk zone
- unpredictable

#### **Task**

**A 21-year-old right-handed female student was working in the photography lab 1 week ago, which required standing all day. After that, she experienced a cold sensation in the left foot and her entire left leg fell asleep. The feeling lasted 4 to 5 days and then slowly went away. Her right lower extremity was fine. Coughing, sneezing, and the Valsalva maneuver did not worsen her symptoms. She had a slight back pain, which she thought was due to using a poor mattress. Past history includes an episode of optic neuritis in the left eye 2 years ago. At that time, she was reportedly depressed and was sleeping constantly. One day, her left eye became blurred and her vision went out. In 1 week, her vision returned to normal. Her vision now is 20/20. She has not had a repeat episode since then. She had an MRI of her brain, which was normal at that time. She drinks alcohol occasionally and does not use any**

**illicit drugs. Her only medication is birth control pills. Examination is significant for brisk reflexes and sustained clonus at the right ankle. Babinski sign is present on the right. Testing is positive for oligoclonal bands. Which of the following is the most likely diagnosis in this case?**

- Seizure
- Transient ischemic attack
- Anaplastic astrocytoma
- Multiple sclerosis
- Parkinson's disease

**What further examination is needed?**

**What results of examination are expected?**

### **Task**

**A patient has brought some test results from an outside doctor with her today. One of the results indicates that oligoclonal bands were positive. What are oligoclonal bands?**

- Wave frequency changes on the EEG during sleep
- Markings about the iris
- Pathologic features of Alzheimer's disease
- Chromosomal markings found with multiple sclerosis
- Immunoglobulin patterns in the cerebrospinal fluid with multiple sclerosis

### **Task**

**A 19-year-old man had an episode of left optic neuritis, which resolved over several weeks. Two years later there was a month long episode of bladder dysfunction. The patient underwent many tests and was told that he had multiple sclerosis. The cerebrospinal fluid in persons with multiple sclerosis will typically exhibit which of the following?**

- Glucose content of less than 20% of the serum content
- Persistently elevated total protein content
- Persistently elevated immunoglobulin G (IgG) content
- Mononuclear cell counts of greater than 100 cells per  $\mu\text{L}$
- Erythrocyte counts of greater than 10 cells per  $\mu\text{L}$

### **Task**

A 25 year old male patient has been suffering from chronic lymphadenopathy, weight loss, fever, and diarrhea for 2 months. Recently apathy, indifference, reduction of libido, poor concentration and memory impairment have developed.

Examination has revealed slight manifestation of Parkinsonism and ataxic gait.

- What preliminary diagnosis would you make?
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### **Task**

**A 9-year-old boy is brought to your clinic by his parents because he has begun to have episodes of eye fluttering lasting several seconds. Sometimes he loses track of his thoughts in the middle of a sentence. There was one fall off a bicycle that may have been related to one of these events. There are no other associated symptoms, and the episodes may occur up to 20 or more times per day. The boy's development and health have been normal up until this point. He did have two head injuries as a young child: the first when he fell off a tricycle onto the ground, and the second when he fell off of a playset onto his head. Both episodes resulted in a brief loss of**

consciousness and he did not think clearly for part of the day afterward, but had no medical intervention. Which of the following tests is most likely to confirm this patient's diagnosis?

- Brain CT scan
- Brain MRI
- Electroencephalogram
- Lumbar puncture
- Nerve conduction study

#### Task

A 19-year-old right-handed man who carries the diagnosis of epilepsy is seen in the urgent care clinic. He had been healthy until about age 12, when he began to have episodes of eye fluttering lasting several seconds. Sometimes he would lose track of his thoughts in the middle of a sentence. There was one fall off of a bicycle that may have been related to one of these events. He has been treated with valproic acid. At one point he was off all medications, but the seizures returned. He is now at the end of his first semester of college and came in today because he had a witnessed generalized tonic-clonic seizure this morning. He had had only about 2 hours of sleep the night before because he was studying for a final exam. Which of the following is the most appropriate thing to tell this patient?

- "I know that you faked this seizure to avoid taking a test."
- "Lack of sleep may have contributed to triggering this seizure."
- "You can expect to have tonic-clonic seizures on a regular basis from now on."
- "Your seizures are getting worse and there is nothing we can do about it."
- "You should take the next semester off to recover and get extensive testing."

#### Task

A 56-year-old man with epilepsy is brought into the emergency room. He has been having continuous generalized tonic-clonic seizures for the past 30 min. He is treated with 2 mg of intravenous lorazepam. Most physicians recommend using a high dose of intravenous benzodiazepine as part of the management of status epilepticus because it has which of the following qualities?

- Ability to suppress seizure activity for more than 24 h after one injection
- Lack of respiratory depressant action
- Rapid onset of action after intravenous administration
- Lack of hypotensive effects
- Lack of dependence on hepatic function for its metabolism and clearance
- 

#### Task

A 44-year-old man presents with left arm shaking. Two days ago, the patient noticed left arm paresthesias along the lateral aspect of his left arm and left fourth and fifth fingers while he was reading. He thinks he may have been leaning on his left arm at the time; the symptoms resolved after 30 seconds. This morning, he noted the same feelings, lasting a few seconds, but then his fourth and fifth fingers started shaking rhythmically, and the shaking then spread to all of his fingers, his hand, and then his arm up to his elbow. This episode lasted a total of 30 seconds. He denies any strange smells or tastes, visual changes, or weakness. Afterward, his fingers felt locked in position for a few seconds. Then he felt as if he did not have control of his hand and had difficulty donning his socks. He and his wife decided to drive to emergency room, and in the car he had trouble putting his seat belt latch into its socket. Examination and routine labs are normal. Which of the following is the most appropriate next action?

- Discharge the patient to follow up in clinic in 2 weeks
- Obtain a brain MRI
- Obtain an electroencephalogram
- Obtain an orthopedic consult
- Order electromyography and nerve conduction studies

**Task**

**A 4-year-old boy has the onset of episodes of loss of body tone, with associated falls, as well as generalized tonic-clonic seizures. His cognitive function has been deteriorating. EEG shows 1.5- to 2-Hz spike-and-wave discharges. Which of the following is the most likely diagnosis?**

- Landau-Kleffner syndrome
- Lennox-Gastaut syndrome
- Juvenile myoclonic epilepsy
- Mitochondrial encephalomyopathy
- Febrile seizures

**Task**

**A 27-year-old man begins to experience infrequent episodes of nausea, warmth rising through his body, and an unusual odor like rotting fish. His girlfriend notices that afterward he may develop twitching of the left side of his face and an inability to speak for several minutes. Afterward the man appears dazed and cannot remember what has occurred. He has otherwise been well. Magnetic resonance imaging of his brain is most likely to show a lesion in which of the following areas?**

- Left occipital lobe
- Right frontal lobe
- Cribriform plate
- Uncus
- Left parietal lobe

**Task**

**A 29-year-old man with a history of febrile seizures as a child has developed medication refractory focal seizures with impaired awareness within the past 2 years. An MRI reveals the small volume abnormality in the left temporal lobe. Which of the following is true regarding this condition?**

- This patient may benefit from a neurosurgical procedure
- The patient will probably die within 2 years
- The seizures will most likely stop with further medication titration
- A head CT should be performed
- A cerebral angiogram may confirm the diagnosis

**Task**

**A 37-year-old man develops involuntary twitching movements in his left thumb. Within 30 s, he notices that the twitching has spread to his entire left hand and that involuntary movements have developed in his left forearm and the left side of his face. He cannot recall what happened subsequently, but his wife reports that he fell down and the entire left side of his body appeared to be twitching. He appeared to be unresponsive for about 3 min and confused for another 15 min. During the episode, he bit his tongue and wet his pants. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic seizures
- Absence
- Focal seizure with impaired awareness
- Focal aware sensory seizure
- Jacksonian march

**Task**

**A 17-year-old boy reports involuntary jerking movements in his arms when he awakens. This has occurred during the day after a nap as well as in the morning after a full night's sleep. Over the next few months, he developed similar jerks during the day, even when he had been awake for several hours. He did not lose consciousness with these muscle jerks, but did**

occasionally fall. On one occasion, jerks in his legs caused a fall that resulted in a fractured wrist. Choose the seizure type that best explains the patient's complaints.

- Generalized tonic-clonic seizures
- Absence
- Focal aware seizure
- Epilepsia partialis continua
- Myoclonic

#### Task

A 21-year-old man reports several episodes over the previous 4 years during which he lost consciousness. He had no warning of the impending episodes, and with each episode he injured himself. Observers told him that he abruptly developed a blank stare and stopped talking. His body became stiff and he arched his back. After several seconds of this type of posturing, his arms and legs started shaking violently. During one of these episodes, he dislocated his right shoulder. He routinely bit his tongue and urinated in his pants during the episodes. Choose the seizure type that best explains the patient's complaints.

- Generalized tonic-clonic
- Generalized absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Focal aware sensory seizure

#### Task

A 25-year-old woman was fired from her job after she misplaced papers vital for the company. She had had recurrent episodes for several years during which she performed nonsensical activities such as burying her plates in the backyard, hiding her underwear, and discarding her checkbook. She did not recall what she had done after performing these peculiar activities. She had been referred for psychotherapy, but the episodes became even more frequent after she was started on thioridazine (Mellaril). Her husband observed one episode and noted that she was unresponsive for about 5 min and confused for at least 1 h. She did not fall down or remain immobile during the episodes. As the episodes became more frequent, she noticed that she would develop an unpleasant taste in her mouth, reminiscent of motor oil, just before an episode. Choose the seizure type that best explains the patient's complaints.

- Generalized tonic-clonic
- Absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Myoclonic

#### Task

A 21-year-old cocaine-abusing man develops seizures that persist for more than 30 min before emergency medical attention is available. When examined nearly 1 h later, he is still exhibiting tonic-clonic movements and has never recovered consciousness. Choose the seizure type that best explains the patient's complaints.

- Generalized tonic-clonic
- Generalized absence
- Jacksonian march
- Tonic-clonic status epilepticus

#### Task

A 38-year-old patient has been suffering from morning headache for a year. The headache decreases at daytime. During the last months the headache became severe and vomiting appeared. Over the last few weeks the weakness the left extremities developed.

Objectively: papilledema and left-side hemiparesis are observed.

- Make an initial diagnosis. What is the future examination.

### Task

The patient is a 45-year-old man. Relatives noticed the changes in his behavior: inappropriate humor, impaired ability to judgments, gait abnormalities and urinary incontinence. The patient complains of constant headache and vomiting which begins each morning before he rise from bed.

Objectively: inappropriate behavior, loss of smell sense and papilledema were revealed. Gait was noticed to be without any signs of cerebellar ataxia.

- What clinical syndromes may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis ? Justify your decision

### Task

The 48-year-old woman complains of headaches, fatigue, muscular pains, vision disturbances and amenorrhea. She notes that she is not able longer to put on rings that used to fit and that her shoe size has progressively increased.

Objectively: enlarged hands and feet, prominent supraorbital ridges, protruded mandible, separated teeth and thick lips, enlarged tongue. Bitemporal hemianopsia.

- Make an preliminary diagnosis.
- Explain the pathophysiological mechanism of bitemporal hemianopsia
- What examinations are necessary to verify a diagnosis?

### Task

The 46-year-old woman has been suffering from progressive unilateral right side loss of hearing for two years. Tinnitus, unstable gait and systemic dizziness appeared half a year ago. Facial numbness and facial weakness developed two weeks ago.

Objectively: papilledema, nystagmus, right side deafness, facial weakness on the right side, intentional tremor and ataxic gait were observed.

- What clinical syndromes may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### Task

A 45-year-old woman complains of pain and paresthesias in the left side of the thorax and weakness in the left leg. Pain appeared two months ago. Her doctor made a diagnosis of “osteochondrosis” and prescribed anti-inflammatory drugs and physiotherapy. However, pains were growing worse, aggravating at coughing, sneezing and movements of the trunk. The pains were unbearable when the woman was lying down. Last week weakness in her left leg appeared.

Objectively: left leg weakness associated with spasticity, high tendon reflexes and positive Babinsky’s symptom was revealed. Decreased pain sensation from the right rib arc to the heel and decreased proprioceptive sensation in the left leg were also observed. Tenderness when tapped over the Th6 spinous process was present.

- What clinical syndrome may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### Task

The patient is a 45-year-old man. He complains of severe pain, numbness and tingling in the buttocks and legs, weakness in legs, and incontinence of bladder and bowels.

These disorders evolved slowly during last 4 months.

Objectively: asymmetric flaccid paraplegia in legs, absence of both ankle and knee jerks, loss of sensation in L4-S5 dermatomes (in lower extremities and an anogenital area) are observed.

- Make an initial diagnosis and prescribe examination and treatment.
- What are the major types of neurogenic bladder?

### **Task**

The patient is a 35 year old driver. He suffered from recurrent back pain for 4 years. 3 days ago he felt acute pain in the lower part of his back after lifting an heavy object. Pain irradiated to his right leg. Pain becomes worse when coughing and sneezing.

Objectively: the movements in the lumbar area are limited because of pain. Knee jerk reflexes are intact, left ankle jerk reflex is present, but the right one is absent. Reduction of muscle power of the right foot flexors is observed. Sensitivity of the lateral parts of the right foot and shin is decreased.

Make a diagnosis and prescribe the treatment for this patient.

### **Task**

A 25 year old man was admitted 15 minutes ago. He got a blow on his face and lost consciousness for 2-3 minutes. When he regain his consciousness he couldn't understand what had happened. Now he complains of headache and nausea.

Objectively: pallor of the face, sweating of palms, postural tremor of fingers and instability in Romberg's test are observed.

- Make an initial diagnosis and prescribe examination.

### **Task**

A 30 year old woman was hospitalized 2 hours after the accident. She was unconscious for 15 minutes after the trauma. Then she began to understand what she was asked about and became able to answer the questions, but was sleepy.

Objectively: perforation of the right tympanic septum and Bell's palsy were revealed.

Make an initial diagnosis and prescribe examination and treatment.

### **Task**

The patient is a 55 year old woman. A week ago she fell down and damaged the back of the head. After that a headache and vomiting developed. Then she felt satisfactory for three days. But the day before yesterday headache appeared again and became more severe. The woman was not able to go to work yesterday. And today she has been taken to hospital by her relatives.

The examination showed the following: low level of consciousness (CGS = 10), widening of the right pupil, bradycardia and left side hemiparesis with Babinsky's sign.

- Make a primary diagnosis and prescribe examination and treatment.

### **Task**

A 32 year-old woman complains of pain in her back and left leg. Three weeks earlier, while standing on a ladder to change a light bulb, she suddenly felt a pain in her left thigh. Later, sharp shooting pain spread down along the posterior side of the left leg to a heel.

Pain was worsened by sitting and standing. Weakness and numbness were denied. There were no sphincter symptoms. There was no history of trauma.

- What nerve(s) and roots are implicated in this woman's pain?
- Where weakness might be expected? What reflex might be lost?
- What are the "danger" symptoms of back pain which would argue for MRI and possible early surgery?
- Give a few etiologies for low back pain.

**Task**

A 28 year old patient fell asleep after alcohol abuse. When he woke up, he felt weakness in his left hand.

Objectively: radial deviation of the hand, weak wrist extension, weak extension of all digits, normal sensory findings are observed.

- Make a diagnosis and prescribe the treatment.

**Task**

A 56-year-old female was hospitalized with complaints of burning pain in shins and feet. For last five years she periodically felt thirsty, suffered from hunger and fatigue.

Objectively: loss of both superficial and deep sensations of the stocking type and absence of ankle reflexes. Systolic blood pressure falls down to 30 mm Hg. when she changes her position from horizontal to vertical one.

Make a diagnosis and prescribe the treatment.

**Task**

A 6 year-old boy presents to clinic for evaluation of "he straddles when he stands and waddles when he walks". These abnormalities were first noted about 2 years ago, but he walked late. He has pelvic and shoulder weakness but his calves appear hypertrophic. His brother, 2 maternal first cousins, and a maternal uncle all died after becoming wheel chair bound.

- What is the inheritance pattern exhibited in this pedigree?
- What is the clinical difference between Duchenne and Becker muscular dystrophy?
- Why are women only rarely affected with Duchenne's? How can the carrier status of an at risk female be determined?
- What is dystrophin?
- In the 1990s how could the clinical diagnosis of Duchenne's muscular dystrophy be confirmed most reliably?

**Task**

A 35-year-old female presented with complaints of intermittent diplopia and ptosis, worse at the end of the day, for the last year. The diplopia fluctuated between horizontal, vertical and diagonal. She described her left eye as "lazy," and stated it had been getting progressively worse. Upon questioning, she complained of generalized muscle weakness, difficulty swallowing and breathing for the last three months.

1. List key signs and symptoms associated with systemic myasthenia gravis.
2. What history questions should one ask every patient suspected of having myasthenia gravis?
3. Describe the diagnostic tests for myasthenia gravis.
4. What are the classes of medication used to treat myasthenia gravis?
5. Describe the mechanism of action of the pharmaceutical agents involved in the treatment of myasthenia gravis.
6. What medications should be avoided in patients with myasthenia gravis?

**Tasks for the assessment of competence "GPC-8":****Task**

A 72 year old woman was hospitalized with speech disorder, weakness in both her arm and leg and paralysis of a gaze. The disease began suddenly when she woke up in the morning. During last week she had two attacks of transient monocular blindness, which lasted for a few seconds.

Objectively: The level of consciousness was normal, but the woman could not speak. Her face was pale, blood pressure was 180/100 mm Hg, pulse was arrhythmical. There was motor aphasia, conjugate gaze deviation to the left, right side hemiparesis and positive Babinsky's sign.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

### Task

A 45 year old man was admitted to clinic. His level of consciousness was reduced, with GCS =10. He had severe headache, vomiting and weakness in both his arm and leg. The disease has developed suddenly after emotional overstrain. Also the patient has been suffering from hypertension for a long time.

Objectively: the patient's face is red. His blood pressure is 220/120 mm Hg, and his pulse is 60 beats per minute. Neck muscles rigidity is about 3 cm, Kerning symptom is positive at an angle of 100°. The left pupil is dilated and right side hemiparesis and hemihypossthesia are observed.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

### Task

A 35 year old man was admitted to the emergency room with confused state. The disease had an acute onset. It began suddenly with a very severe headache, after which the disturbance of consciousness and vomiting developed.

Objectively: there is delirium, neck muscles rigidity of 5 cm, Kerning's symptom. Focal neurologic symptoms are absent.

- Make an preliminary diagnosis
  - What examinations are necessary to verify a diagnosis?

### Task

How would you comment the following CSF?

- Pleocytosis is 120/mm<sup>3</sup>
- Lymphocytes are 100/ mm<sup>3</sup>
- Polymorphonuclear leukocytes are 20/ mm<sup>3</sup>
- Proteins are 1.66 g/L
- Sugar content is 20 mg/dL
- CSF is cloudy with clots.

### Task

How would you comment the following CSF?

- CSF pressure is 400 mm H<sub>2</sub>O
- The CSF is cloudy and of yellow-green color
- Cytosis is 2000/ mm<sup>3</sup> ; polymorphonuclear leukocytes (neutrophils) are prevailed
- Protein is 5,6 g/L
- Sugar content is 20 mg/dL.

### Task

A 36 year old woman was hospitalized with severe headache and weakness in both her left arm and leg. Disease has been developing gradually for 2 weeks. The woman has chronic infection in the middle ear.

Objectively: the patient is confused; body temperature is 38,9°. Left side spastic hemiparesis and papilledema are present.

Laboratory blood tests: the cell count and erythrocyte sedimentation rate are elevated.

The brain precontrast CT scan reveals an area of higher density than the surrounding edematous brain in the right frontal lobe. The contrast CT study demonstrates rim enhancing lesion with thickened capsule and hypodense central cavity.

- What is the diagnosis
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

**Task**

A 20 year old female complains of fever, chills, severe headache, nausea and vomiting. The onset of disease was acute

Objectively: level of consciousness is altered (GCS = 13). The body temperature is 39°C. There are petechiae on the skin. Fast pulse, shortness of breath and stiffness of neck muscles are present. Kernig's sign is positive.

- What is an preliminary diagnosis?
- What laboratory data are needed for the final diagnosis?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

**Task**

A 22 year old male patient has been suffering from weakness, irritability, headache, fever, vomiting and insomnia for 8 days. The last 2 days the visual acuity decreased and double vision appeared.

Objectively: body temperature is 37,8°C. Stiffness of neck muscles, positive Kernig's signs, incomplete bilateral ptosis, dilatation of both pupils and slight strabismus divergent are observed.

- What is a preliminary diagnosis
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

**Task**

**What structures of the brain and the spinal cord are not impaired by multiple sclerosis?**

- cranial nerves nuclei
- white matter of the brain in paraventricular localization
- peduncles of cerebellum
- spinal cord white matter
- corpus callosum

**Task**

**Which of the following CSF findings is least suggestive of acute multiple sclerosis?**

- an IgG index greater than 1.7
- increased myelin basic protein
- increased protein to 200 mg/dL
- presence of oligoclonal bands
- slight to moderate monocytic pleocytosis

**Task**

**Which of the following signs or symptoms occurring in a young person is the most suggestive of multiple sclerosis?**

- bilateral internuclear ophthalmoplegia
- gait ataxia
- Lhermitte's sign
- optic neuritis
- vertigo

**Task**

**Persons migrating from a zone with high risk of multiple sclerosis (MS) to one of low risk after age 15 show a risk of developing MS that is**

- equal to that of the high-risk zone
- equal to that of the low-risk zone
- intermediate between the two zones
- lower than that of the low-risk zone
- unpredictable

#### **Task**

**A 21-year-old right-handed female student was working in the photography lab 1 week ago, which required standing all day. After that, she experienced a cold sensation in the left foot and her entire left leg fell asleep. The feeling lasted 4 to 5 days and then slowly went away. Her right lower extremity was fine. Coughing, sneezing, and the Valsalva maneuver did not worsen her symptoms. She had a slight back pain, which she thought was due to using a poor mattress. Past history includes an episode of optic neuritis in the left eye 2 years ago. At that time, she was reportedly depressed and was sleeping constantly. One day, her left eye became blurred and her vision went out. In 1 week, her vision returned to normal.**

**Her vision now is 20/20. She has not had a repeat episode since then. She had an MRI of her brain, which was normal at that time. She drinks alcohol occasionally and does not use any illicit drugs. Her only medication is birth control pills. Examination is significant for brisk reflexes and sustained clonus at the right ankle. Babinski sign is present on the right. Testing is positive for oligoclonal bands. Which of the following is the most likely diagnosis in this case?**

- Seizure
- Transient ischemic attack
- Anaplastic astrocytoma
- Multiple sclerosis
- Parkinson's disease

**What further examination is needed?**

**What results of examination are expected?**

#### **Task**

**A patient has brought some test results from an outside doctor with her today. One of the results indicates that oligoclonal bands were positive. What are oligoclonal bands?**

- Wave frequency changes on the EEG during sleep
- Markings about the iris
- Pathologic features of Alzheimer's disease
- Chromosomal markings found with multiple sclerosis
- Immunoglobulin patterns in the cerebrospinal fluid with multiple sclerosis

#### **Task**

**A 19-year-old man had an episode of left optic neuritis, which resolved over several weeks. Two years later there was a month long episode of bladder dysfunction. The patient underwent many tests and was told that he had multiple sclerosis. The cerebrospinal fluid in persons with multiple sclerosis will typically exhibit which of the following?**

- Glucose content of less than 20% of the serum content
- Persistently elevated total protein content
- Persistently elevated immunoglobulin G (IgG) content
- Mononuclear cell counts of greater than 100 cells per  $\mu\text{L}$
- Erythrocyte counts of greater than 10 cells per  $\mu\text{L}$

#### **Task**

A 25 year old male patient has been suffering from chronic lymphadenopathy, weight loss, fever, and diarrhea for 2 months. Recently apathy, indifference, reduction of libido, poor concentration and memory impairment have developed.

Examination has revealed slight manifestation of Parkinsonism and ataxic gait.

- What preliminary diagnosis would you make?
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

#### **Task**

**A 9-year-old boy is brought to your clinic by his parents because he has begun to have episodes of eye fluttering lasting several seconds. Sometimes he loses track of his thoughts in the middle of a sentence. There was one fall off a bicycle that may have been related to one of these events. There are no other associated symptoms, and the episodes may occur up to 20 or more times per day. The boy's development and health have been normal up until this point. He did have two head injuries as a young child: the first when he fell off a tricycle onto the ground, and the second when he fell off of a playset onto his head. Both episodes resulted in a brief loss of consciousness and he did not think clearly for part of the day afterward, but had no medical intervention. Which of the following tests is most likely to confirm this patient's diagnosis?**

- Brain CT scan
- Brain MRI
- Electroencephalogram
- Lumbar puncture
- Nerve conduction study

#### **Task**

**A 19-year-old right-handed man who carries the diagnosis of epilepsy is seen in the urgent care clinic. He had been healthy until about age 12, when he began to have episodes of eye fluttering lasting several seconds. Sometimes he would lose track of his thoughts in the middle of a sentence. There was one fall off of a bicycle that may have been related to one of these events. He has been treated with valproic acid. At one point he was off all medications, but the seizures returned. He is now at the end of his first semester of college and came in today because he had a witnessed generalized tonic-clonic seizure this morning. He had had only about 2 hours of sleep the night before because he was studying for a final exam. Which of the following is the most appropriate thing to tell this patient?**

- "I know that you faked this seizure to avoid taking a test."
- "Lack of sleep may have contributed to triggering this seizure."
- "You can expect to have tonic-clonic seizures on a regular basis from now on."
- "Your seizures are getting worse and there is nothing we can do about it."
- "You should take the next semester off to recover and get extensive testing."

#### **Task**

**A 56-year-old man with epilepsy is brought into the emergency room. He has been having continuous generalized tonic-clonic seizures for the past 30 min. He is treated with 2 mg of intravenous lorazepam. Most physicians recommend using a high dose of intravenous benzodiazepine as part of the management of status epilepticus because it has which of the following qualities?**

- Ability to suppress seizure activity for more than 24 h after one injection
- Lack of respiratory depressant action
- Rapid onset of action after intravenous administration
- Lack of hypotensive effects

- Lack of dependence on hepatic function for its metabolism and clearance
- 

#### Task

**A 44-year-old man presents with left arm shaking. Two days ago, the patient noticed left arm paresthesias along the lateral aspect of his left arm and left fourth and fifth fingers while he was reading. He thinks he may have been leaning on his left arm at the time; the symptoms resolved after 30 seconds. This morning, he noted the same feelings, lasting a few seconds, but then his fourth and fifth fingers started shaking rhythmically, and the shaking then spread to all of his fingers, his hand, and then his arm up to his elbow. This episode lasted a total of 30 seconds. He denies any strange smells or tastes, visual changes, or weakness. Afterward, his fingers felt locked in position for a few seconds. Then he felt as if he did not have control of his hand and had difficulty donning his socks. He and his wife decided to drive to emergency room, and in the car he had trouble putting his seat belt latch into its socket. Examination and routine labs are normal. Which of the following is the most appropriate next action?**

- Discharge the patient to follow up in clinic in 2 weeks
- Obtain a brain MRI
- Obtain an electroencephalogram
- Obtain an orthopedic consult
- Order electromyography and nerve conduction studies

#### Task

**A 4-year-old boy has the onset of episodes of loss of body tone, with associated falls, as well as generalized tonic-clonic seizures. His cognitive function has been deteriorating. EEG shows 1.5- to 2-Hz spike-and-wave discharges. Which of the following is the most likely diagnosis?**

- Landau-Kleffner syndrome
- Lennox-Gastaut syndrome
- Juvenile myoclonic epilepsy
- Mitochondrial encephalomyopathy
- Febrile seizures

#### Task

**A 27-year-old man begins to experience infrequent episodes of nausea, warmth rising through his body, and an unusual odor like rotting fish. His girlfriend notices that afterward he may develop twitching of the left side of his face and an inability to speak for several minutes. Afterward the man appears dazed and cannot remember what has occurred. He has otherwise been well. Magnetic resonance imaging of his brain is most likely to show a lesion in which of the following areas?**

- Left occipital lobe
- Right frontal lobe
- Cribriform plate
- Uncus
- Left parietal lobe

#### Task

**A 29-year-old man with a history of febrile seizures as a child has developed medication refractory focal seizures with impaired awareness within the past 2 years. An MRI reveals the small volume abnormality in the left temporal lobe. Which of the following is true regarding this condition?**

- This patient may benefit from a neurosurgical procedure
- The patient will probably die within 2 years
- The seizures will most likely stop with further medication titration
- A head CT should be performed
- A cerebral angiogram may confirm the diagnosis

### **Task**

**A 37-year-old man develops involuntary twitching movements in his left thumb. Within 30 s, he notices that the twitching has spread to his entire left hand and that involuntary movements have developed in his left forearm and the left side of his face. He cannot recall what happened subsequently, but his wife reports that he fell down and the entire left side of his body appeared to be twitching. He appeared to be unresponsive for about 3 min and confused for another 15 min. During the episode, he bit his tongue and wet his pants. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic seizures
- Absence
- Focal seizure with impaired awareness
- Focal aware sensory seizure
- Jacksonian march

### **Task**

**A 17-year-old boy reports involuntary jerking movements in his arms when he awakens. This has occurred during the day after a nap as well as in the morning after a full night's sleep. Over the next few months, he developed similar jerks during the day, even when he had been awake for several hours. He did not lose consciousness with these muscle jerks, but did occasionally fall. On one occasion, jerks in his legs caused a fall that resulted in a fractured wrist. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic seizures
- Absence
- Focal aware seizure
- Epilepsia partialis continua
- Myoclonic

### **Task**

**A 21-year-old man reports several episodes over the previous 4 years during which he lost consciousness. He had no warning of the impending episodes, and with each episode he injured himself. Observers told him that he abruptly developed a blank stare and stopped talking. His body became stiff and he arched his back. After several seconds of this type of posturing, his arms and legs started shaking violently. During one of these episodes, he dislocated his right shoulder. He routinely bit his tongue and urinated in his pants during the episodes. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Generalized absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Focal aware sensory seizure

### **Task**

**A 25-year-old woman was fired from her job after she misplaced papers vital for the company. She had had recurrent episodes for several years during which she performed nonsensical activities such as burying her plates in the backyard, hiding her underwear, and discarding her checkbook. She did not recall what she had done after performing these peculiar activities. She had been referred for psychotherapy, but the episodes became even more frequent after she was started on thioridazine (Mellaril). Her husband observed one episode and noted that she was unresponsive for about 5 min and confused for at least 1 h. She did not fall down or remain immobile during the episodes. As the episodes became more frequent, she noticed that she would develop an unpleasant taste in her mouth, reminiscent of motor oil, just before an episode. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic

- Absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Myoclonic

### Task

**A 21-year-old cocaine-abusing man develops seizures that persist for more than 30 min before emergency medical attention is available. When examined nearly 1 h later, he is still exhibiting tonic-clonic movements and has never recovered consciousness. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Generalized absence
- Jacksonian march
- Tonic-clonic status epilepticus

### Task

A 38-year-old patient has been suffering from morning headache for a year. The headache decreases at daytime. During the last months the headache became severe and vomiting appeared. Over the last few weeks the weakness the left extremities developed.

Objectively: papilledema and left-side hemiparesis are observed.

- Make an initial diagnosis. What is the future examination.

### Task

The patient is a 45-year-old man. Relatives noticed the changes in his behavior: inappropriate humor, impaired ability to judgments, gait abnormalities and urinary incontinence. The patient complains of constant headache and vomiting which begins each morning before he rise from bed.

Objectively: inappropriate behavior, loss of smell sense and papilledema were revealed. Gait was noticed to be without any signs of cerebellar ataxia.

- What clinical syndromes may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis ? Justify your decision

### Task

The 48-year-old woman complains of headaches, fatigue, muscular pains, vision disturbances and amenorrhea. She notes that she is not able longer to put on rings that used to fit and that her shoe size has progressively increased.

Objectively: enlarged hands and feet, prominent supraorbital ridges, protruded mandible, separated teeth and thick lips, enlarged tongue. Bitemporal hemianopsia.

- Make an preliminary diagnosis.
- Explain the pathophysiological mechanism of bitemporal hemianopsia
- What examinations are necessary to verify a diagnosis?

### Task

The 46-year-old woman has been suffering from progressive unilateral right side loss of hearing for two years. Tinnitus, unstable gait and systemic dizziness appeared half a year ago. Facial numbness and facial weakness developed two weeks ago.

Objectively: papilledema, nystagmus, right side deafness, facial weakness on the right side, intentional tremor and ataxic gait were observed.

- What clinical syndromes may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?

- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### **Task**

A 45-year-old woman complains of pain and paresthesias in the left side of the thorax and weakness in the left leg. Pain appeared two months ago. Her doctor made a diagnosis of “osteochondrosis” and prescribed anti-inflammatory drugs and physiotherapy. However, pains were growing worse, aggravating at coughing, sneezing and movements of the trunk. The pains were unbearable when the woman was lying down. Last week weakness in her left leg appeared.

Objectively: left leg weakness associated with spasticity, high tendon reflexes and positive Babinsky’s symptom was revealed. Decreased pain sensation from the right rib arc to the heel and decreased proprioceptive sensation in the left leg were also observed. Tenderness when tapped over the Th6 spinous process was present.

- What clinical syndrome may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### **Task**

The patient is a 45-year-old man. He complains of severe pain, numbness and tingling in the buttocks and legs, weakness in legs, and incontinence of bladder and bowels.

These disorders evolved slowly during last 4 months.

Objectively: asymmetric flaccid paraplegia in legs, absence of both ankle and knee jerks, loss of sensation in L4-S5 dermatomes (in lower extremities and an anogenital area) are observed.

- Make an initial diagnosis and prescribe examination and treatment.
- What are the major types of neurogenic bladder?

### **Task**

The patient is a 35 year old driver. He suffered from recurrent back pain for 4 years. 3 days ago he felt acute pain in the lower part of his back after lifting an heavy object. Pain irradiated to his right leg. Pain becomes worse when coughing and sneezing.

Objectively: the movements in the lumbar area are limited because of pain. Knee jerk reflexes are intact, left ankle jerk reflex is present, but the right one is absent. Reduction of muscle power of the right foot flexors is observed. Sensitivity of the lateral parts of the right foot and shin is decreased.

Make a diagnosis and prescribe the treatment for this patient.

### **Task**

A 25 year old man was admitted 15 minutes ago. He got a blow on his face and lost consciousness for 2-3 minutes. When he regain his consciousness he couldn’t understand what had happened. Now he complains of headache and nausea.

Objectively: pallor of the face, sweating of palms, postural tremor of fingers and instability in Romberg’s test are observed.

- Make an initial diagnosis and prescribe examination.

### **Task**

A 30 year old woman was hospitalized 2 hours after the accident. She was unconscious for 15 minutes after the trauma. Then she began to understand what she was asked about and became able to answer the questions, but was sleepy.

Objectively: perforation of the right tympanic septum and Bell’s palsy were revealed.

Make an initial diagnosis and prescribe examination and treatment.

### **Task**

The patient is a 55 year old woman. A week ago she fell down and damaged the back of the head. After that a headache and vomiting developed. Then she felt satisfactory for three days. But the day before yesterday headache appeared again and became more severe. The woman was not able to go to work yesterday. And today she has been taken to hospital by her relatives.

The examination showed the following: low level of consciousness (CGS = 10), widening of the right pupil, bradycardia and left side hemiparesis with Babinsky's sign.

- Make a primary diagnosis and prescribe examination and treatment.

### **Task**

A 32 year-old woman complains of pain in her back and left leg. Three weeks earlier, while standing on a ladder to change a light bulb, she suddenly felt a pain in her left thigh. Later, sharp shooting pain spread down along the posterior side of the left leg to a heel.

Pain was worsened by sitting and standing. Weakness and numbness were denied. There were no sphincter symptoms. There was no history of trauma.

- What nerve(s) and roots are implicated in this woman's pain?
- Where weakness might be expected? What reflex might be lost?
- What are the "danger" symptoms of back pain which would argue for MRI and possible early surgery?
- Give a few etiologies for low back pain.

### **Task**

A 28 year old patient fell asleep after alcohol abuse. When he woke up, he felt weakness in his left hand.

Objectively: radial deviation of the hand, weak wrist extension, weak extension of all digits, normal sensory findings are observed.

- Make a diagnosis and prescribe the treatment.

### **Task**

A 56-year-old female was hospitalized with complaints of burning pain in shins and feet. For last five years she periodically felt thirsty, suffered from hunger and fatigue.

Objectively: loss of both superficial and deep sensations of the stocking type and absence of ankle reflexes. Systolic blood pressure falls down to 30 mm Hg. when she changes her position from horizontal to vertical one.

Make a diagnosis and prescribe the treatment.

### **Task**

A 6 year-old boy presents to clinic for evaluation of "he straddles when he stands and waddles when he walks". These abnormalities were first noted about 2 years ago, but he walked late. He has pelvic and shoulder weakness but his calves appear hypertrophic. His brother, 2 maternal first cousins, and a maternal uncle all died after becoming wheel chair bound.

- What is the inheritance pattern exhibited in this pedigree?
- What is the clinical difference between Duchenne and Becker muscular dystrophy?
- Why are women only rarely affected with Duchenne's? How can the carrier status of an at risk female be determined?
- What is dystrophin?
- In the 1990s how could the clinical diagnosis of Duchenne's muscular dystrophy be confirmed most reliably?

### **Task**

A 35-year-old female presented with complaints of intermittent diplopia and ptosis, worse at the end of the day, for the last year. The diplopia fluctuated between horizontal, vertical and diagonal. She described her left eye as "lazy," and stated it had been getting progressively worse.

Upon questioning, she complained of generalized muscle weakness, difficulty swallowing and breathing for the last three months.

1. List key signs and symptoms associated with systemic myasthenia gravis.
2. What history questions should one ask every patient suspected of having myasthenia gravis?
3. Describe the diagnostic tests for myasthenia gravis.
4. What are the classes of medication used to treat myasthenia gravis?
5. Describe the mechanism of action of the pharmaceutical agents involved in the treatment of myasthenia gravis.
6. What medications should be avoided in patients with myasthenia gravis?

### **Tasks for the assessment of competence "PC – 1":**

#### **Task**

A 72 year old woman was hospitalized with speech disorder, weakness in both her arm and leg and paralysis of a gaze. The disease began suddenly when she woke up in the morning. During last week she had two attacks of transient monocular blindness, which lasted for a few seconds.

Objectively: The level of consciousness was normal, but the woman could not speak. Her face was pale, blood pressure was 180/100 mm Hg, pulse was arrhythmical. There was motor aphasia, conjugate gaze deviation to the left, right side hemiparesis and positive Babinsky's sign.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

#### **Task**

A 45 year old man was admitted to clinic. His level of consciousness was reduced, with GCS =10. He had severe headache, vomiting and weakness in both his arm and leg. The disease has developed suddenly after emotional overstrain. Also the patient has been suffering from hypertension for a long time.

Objectively: the patient's face is red. His blood pressure is 220/120 mm Hg, and his pulse is 60 beats per minute. Neck muscles rigidity is about 3 cm, Kerning symptom is positive at an angle of 100°. The left pupil is dilated and right side hemiparesis and hemihypossthesia are observed.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

#### **Task**

A 35 year old man was admitted to the emergency room with confused state. The disease had an acute onset. It began suddenly with a very severe headache, after which the disturbance of consciousness and vomiting developed.

Objectively: there is delirium, neck muscles rigidity of 5 cm, Kerning's symptom. Focal neurologic symptoms are absent.

- Make an preliminary diagnosis
  - What examinations are necessary to verify a diagnosis?

#### **Task**

How would you comment the following CSF?

- Pleocytosis is 120/mm<sup>3</sup>
- Lymphocytes are 100/ mm<sup>3</sup>
- Polymorphonuclear leukocytes are 20/ mm<sup>3</sup>
- Proteins are 1.66 g/L
- Sugar content is 20 mg/dL
- CSF is cloudy with clots.

### Task

How would you comment the following CSF?

- CSF pressure is 400 mm H<sub>2</sub>O
- The CSF is cloudy and of yellow-green color
- Cytosis is 2000/ mm<sup>3</sup> ; polymorphonuclear leukocytes (neutrophils) are prevailed
- Protein is 5,6 g/L
- Sugar content is 20 mg/dL.

### Task

A 36 year old woman was hospitalized with severe headache and weakness in both her left arm and leg. Disease has been developing gradually for 2 weeks. The woman has chronic infection in the middle ear.

Objectively: the patient is confused; body temperature is 38,9°. Left side spastic hemiparesis and papilledema are present.

Laboratory blood tests: the cell count and erythrocyte sedimentation rate are elevated.

The brain precontrast CT scan reveals an area of higher density than the surrounding edematous brain in the right frontal lobe. The contrast CT study demonstrates rim enhancing lesion with thickened capsule and hypodense central cavity.

- What is the diagnosis
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### Task

A 20 year old female complains of fever, chills, severe headache, nausea and vomiting. The onset of disease was acute

Objectively: level of consciousness is altered (GCS = 13). The body temperature is 39°C. There are petechiae on the skin. Fast pulse, shortness of breath and stiffness of neck muscles are present. Kernig's sign is positive.

- What is an preliminary diagnosis?
- What laboratory data are needed for the final diagnosis?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### Task

A 22 year old male patient has been suffering from weakness, irritability, headache, fever, vomiting and insomnia for 8 days. The last 2 days the visual acuity decreased and double vision appeared.

Objectively: body temperature is 37,8°C. Stiffness of neck muscles, positive Kernig's signs, incomplete bilateral ptosis, dilatation of both pupils and slight strabismus divergent are observed.

- What is a preliminary diagnosis
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### Task

**What structures of the brain and the spinal cord are not impaired by multiple sclerosis?**

- cranial nerves nuclei
- white matter of the brain in paraventricular localization
- peduncles of cerebellum
- spinal cord white matter
- corpus callosum

**Task**

**Which of the following CSF findings is least suggestive of acute multiple sclerosis?**

- an IgG index greater than 1.7
- increased myelin basic protein
- increased protein to 200 mg/dL
- presence of oligoclonal bands
- slight to moderate monocytic pleocytosis

**Task**

**Which of the following signs or symptoms occurring in a young person is the most suggestive of multiple sclerosis?**

- bilateral internuclear ophthalmoplegia
- gait ataxia
- Lhermitte's sign
- optic neuritis
- vertigo

**Task**

**Persons migrating from a zone with high risk of multiple sclerosis (MS) to one of low risk after age 15 show a risk of developing MS that is**

- equal to that of the high-risk zone
- equal to that of the low-risk zone
- intermediate between the two zones
- lower than that of the low-risk zone
- unpredictable

**Task**

**A 21-year-old right-handed female student was working in the photography lab 1 week ago, which required standing all day. After that, she experienced a cold sensation in the left foot and her entire left leg fell asleep. The feeling lasted 4 to 5 days and then slowly went away. Her right lower extremity was fine. Coughing, sneezing, and the Valsalva maneuver did not worsen her symptoms. She had a slight back pain, which she thought was due to using a poor mattress. Past history includes an episode of optic neuritis in the left eye 2 years ago. At that time, she was reportedly depressed and was sleeping constantly. One day, her left eye became blurred and her vision went out. In 1 week, her vision returned to normal.**

**Her vision now is 20/20. She has not had a repeat episode since then. She had an MRI of her brain, which was normal at that time. She drinks alcohol occasionally and does not use any illicit drugs. Her only medication is birth control pills. Examination is significant for brisk reflexes and sustained clonus at the right ankle. Babinski sign is present on the right. Testing is positive for oligoclonal bands. Which of the following is the most likely diagnosis in this case?**

- Seizure
- Transient ischemic attack
- Anaplastic astrocytoma
- Multiple sclerosis
- Parkinson's disease

**What further examination is needed?**

**What results of examination are expected?**

**Task**

**A patient has brought some test results from an outside doctor with her today. One of the results indicates that oligoclonal bands were positive. What are oligoclonal bands?**

- Wave frequency changes on the EEG during sleep
- Markings about the iris

- Pathologic features of Alzheimer's disease
- Chromosomal markings found with multiple sclerosis
- Immunoglobulin patterns in the cerebrospinal fluid with multiple sclerosis

### Task

**A 19-year-old man had an episode of left optic neuritis, which resolved over several weeks. Two years later there was a month long episode of bladder dysfunction. The patient underwent many tests and was told that he had multiple sclerosis. The cerebrospinal fluid in persons with multiple sclerosis will typically exhibit which of the following?**

- Glucose content of less than 20% of the serum content
- Persistently elevated total protein content
- Persistently elevated immunoglobulin G (IgG) content
- Mononuclear cell counts of greater than 100 cells per  $\mu\text{L}$
- Erythrocyte counts of greater than 10 cells per  $\mu\text{L}$

### Task

A 25 year old male patient has been suffering from chronic lymphadenopathy, weight loss, fever, and diarrhea for 2 months. Recently apathy, indifference, reduction of libido, poor concentration and memory impairment have developed.

Examination has revealed slight manifestation of Parkinsonism and ataxic gait.

- What preliminary diagnosis would you make?
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### Task

**A 9-year-old boy is brought to your clinic by his parents because he has begun to have episodes of eye fluttering lasting several seconds. Sometimes he loses track of his thoughts in the middle of a sentence. There was one fall off a bicycle that may have been related to one of these events. There are no other associated symptoms, and the episodes may occur up to 20 or more times per day. The boy's development and health have been normal up until this point. He did have two head injuries as a young child: the first when he fell off a tricycle onto the ground, and the second when he fell off of a playset onto his head. Both episodes resulted in a brief loss of consciousness and he did not think clearly for part of the day afterward, but had no medical intervention. Which of the following tests is most likely to confirm this patient's diagnosis?**

- Brain CT scan
- Brain MRI
- Electroencephalogram
- Lumbar puncture
- Nerve conduction study

### Task

**A 19-year-old right-handed man who carries the diagnosis of epilepsy is seen in the urgent care clinic. He had been healthy until about age 12, when he began to have episodes of eye fluttering lasting several seconds. Sometimes he would lose track of his thoughts in the middle of a sentence. There was one fall off of a bicycle that may have been related to one of these events. He has been treated with valproic acid. At one point he was off all medications, but the seizures returned. He is now at the end of his first semester of college and came in today because he had a witnessed generalized tonic-clonic seizure this morning. He had had only about 2 hours of**

**sleep the night before because he was studying for a final exam. Which of the following is the most appropriate thing to tell this patient?**

- “I know that you faked this seizure to avoid taking a test.”
- “Lack of sleep may have contributed to triggering this seizure.”
- “You can expect to have tonic-clonic seizures on a regular basis from now on.”
- “Your seizures are getting worse and there is nothing we can do about it.”
- “You should take the next semester off to recover and get extensive testing.”

#### **Task**

**A 56-year-old man with epilepsy is brought into the emergency room. He has been having continuous generalized tonic-clonic seizures for the past 30 min. He is treated with 2 mg of intravenous lorazepam. Most physicians recommend using a high dose of intravenous benzodiazepine as part of the management of status epilepticus because it has which of the following qualities?**

- Ability to suppress seizure activity for more than 24 h after one injection
- Lack of respiratory depressant action
- Rapid onset of action after intravenous administration
- Lack of hypotensive effects
- Lack of dependence on hepatic function for its metabolism and clearance
- 

#### **Task**

**A 44-year-old man presents with left arm shaking. Two days ago, the patient noticed left arm paresthesias along the lateral aspect of his left arm and left fourth and fifth fingers while he was reading. He thinks he may have been leaning on his left arm at the time; the symptoms resolved after 30 seconds. This morning, he noted the same feelings, lasting a few seconds, but then his fourth and fifth fingers started shaking rhythmically, and the shaking then spread to all of his fingers, his hand, and then his arm up to his elbow. This episode lasted a total of 30 seconds. He denies any strange smells or tastes, visual changes, or weakness. Afterward, his fingers felt locked in position for a few seconds. Then he felt as if he did not have control of his hand and had difficulty donning his socks. He and his wife decided to drive to emergency room, and in the car he had trouble putting his seat belt latch into its socket. Examination and routine labs are normal. Which of the following is the most appropriate next action?**

- Discharge the patient to follow up in clinic in 2 weeks
- Obtain a brain MRI
- Obtain an electroencephalogram
- Obtain an orthopedic consult
- Order electromyography and nerve conduction studies

#### **Task**

**A 4-year-old boy has the onset of episodes of loss of body tone, with associated falls, as well as generalized tonic-clonic seizures. His cognitive function has been deteriorating. EEG shows 1.5- to 2-Hz spike-and-wave discharges. Which of the following is the most likely diagnosis?**

- Landau-Kleffner syndrome
- Lennox-Gastaut syndrome
- Juvenile myoclonic epilepsy
- Mitochondrial encephalomyopathy
- Febrile seizures

#### **Task**

**A 27-year-old man begins to experience infrequent episodes of nausea, warmth rising through his body, and an unusual odor like rotting fish. His girlfriend notices that afterward he may develop twitching of the left side of his face and an inability to speak for several minutes. Afterward the man appears dazed and cannot remember what has occurred. He has otherwise**

**been well. Magnetic resonance imaging of his brain is most likely to show a lesion in which of the following areas?**

- Left occipital lobe
- Right frontal lobe
- Cribriform plate
- Uncus
- Left parietal lobe

#### **Task**

**A 29-year-old man with a history of febrile seizures as a child has developed medication refractory focal seizures with impaired awareness within the past 2 years. An MRI reveals the small volume abnormality in the left temporal lobe. Which of the following is true regarding this condition?**

- This patient may benefit from a neurosurgical procedure
- The patient will probably die within 2 years
- The seizures will most likely stop with further medication titration
- A head CT should be performed
- A cerebral angiogram may confirm the diagnosis

#### **Task**

**A 37-year-old man develops involuntary twitching movements in his left thumb. Within 30 s, he notices that the twitching has spread to his entire left hand and that involuntary movements have developed in his left forearm and the left side of his face. He cannot recall what happened subsequently, but his wife reports that he fell down and the entire left side of his body appeared to be twitching. He appeared to be unresponsive for about 3 min and confused for another 15 min. During the episode, he bit his tongue and wet his pants. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic seizures
- Absence
- Focal seizure with impaired awareness
- Focal aware sensory seizure
- Jacksonian march

#### **Task**

**A 17-year-old boy reports involuntary jerking movements in his arms when he awakens. This has occurred during the day after a nap as well as in the morning after a full night's sleep. Over the next few months, he developed similar jerks during the day, even when he had been awake for several hours. He did not lose consciousness with these muscle jerks, but did occasionally fall. On one occasion, jerks in his legs caused a fall that resulted in a fractured wrist. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic seizures
- Absence
- Focal aware seizure
- Epilepsia partialis continua
- Myoclonic

#### **Task**

**A 21-year-old man reports several episodes over the previous 4 years during which he lost consciousness. He had no warning of the impending episodes, and with each episode he injured himself. Observers told him that he abruptly developed a blank stare and stopped talking. His body became stiff and he arched his back. After several seconds of this type of posturing, his arms and legs started shaking violently. During one of these episodes, he dislocated his right shoulder. He routinely bit his tongue and urinated in his pants during the episodes. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Generalized absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Focal aware sensory seizure

### Task

**A 25-year-old woman was fired from her job after she misplaced papers vital for the company. She had had recurrent episodes for several years during which she performed nonsensical activities such as burying her plates in the backyard, hiding her underwear, and discarding her checkbook. She did not recall what she had done after performing these peculiar activities. She had been referred for psychotherapy, but the episodes became even more frequent after she was started on thioridazine (Mellaril). Her husband observed one episode and noted that she was unresponsive for about 5 min and confused for at least 1 h. She did not fall down or remain immobile during the episodes. As the episodes became more frequent, she noticed that she would develop an unpleasant taste in her mouth, reminiscent of motor oil, just before an episode. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Myoclonic

### Task

**A 21-year-old cocaine-abusing man develops seizures that persist for more than 30 min before emergency medical attention is available. When examined nearly 1 h later, he is still exhibiting tonic-clonic movements and has never recovered consciousness. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Generalized absence
- Jacksonian march
- Tonic-clonic status epilepticus

### Task

A 38-year-old patient has been suffering from morning headache for a year. The headache decreases at daytime. During the last months the headache became severe and vomiting appeared. Over the last few weeks the weakness the left extremities developed.

Objectively: papilledema and left-side hemiparesis are observed.

- Make an initial diagnosis. What is the future examination.

### Task

The patient is a 45-year-old man. Relatives noticed the changes in his behavior: inappropriate humor, impaired ability to judgments, gait abnormalities and urinary incontinence. The patient complains of constant headache and vomiting which begins each morning before he rise from bed.

Objectively: inappropriate behavior, loss of smell sense and papilledema were revealed. Gait was noticed to be without any signs of cerebellar ataxia.

- What clinical syndromes may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis ? Justify your decision

### Task

The 48-year-old woman complains of headaches, fatigue, muscular pains, vision disturbances and amenorrhea. She notes that she is not able longer to put on rings that used to fit and that her shoe size has progressively increased.

Objectively: enlarged hands and feet, prominent supraorbital ridges, protruded mandible, separated teeth and thick lips, enlarged tongue. Bitemporal hemianopsia.

- Make an preliminary diagnosis.
- Explain the pathophysiological mechanism of bitemporal hemianopsia
- What examinations are necessary to verify a diagnosis?

### **Task**

The 46-year-old woman has been suffering from progressive unilateral right side loss of hearing for two years. Tinnitus, unstable gait and systemic dizziness appeared half a year ago. Facial numbness and facial weakness developed two weeks ago.

Objectively: papilledema, nystagmus, right side deafness, facial weakness on the right side, intentional tremor and ataxic gait were observed.

- What clinical syndromes may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### **Task**

A 45-year-old woman complains of pain and paresthesias in the left side of the thorax and weakness in the left leg. Pain appeared two months ago. Her doctor made a diagnosis of “osteochondrosis” and prescribed anti-inflammatory drugs and physiotherapy. However, pains were growing worse, aggravating at coughing, sneezing and movements of the trunk. The pains were unbearable when the woman was lying down. Last week weakness in her left leg appeared.

Objectively: left leg weakness associated with spasticity, high tendon reflexes and positive Babinsky’s symptom was revealed. Decreased pain sensation from the right rib arc to the heel and decreased proprioceptive sensation in the left leg were also observed. Tenderness when tapped over the Th6 spinous process was present.

- What clinical syndrome may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### **Task**

The patient is a 45-year-old man. He complains of severe pain, numbness and tingling in the buttocks and legs, weakness in legs, and incontinence of bladder and bowels.

These disorders evolved slowly during last 4 months.

Objectively: asymmetric flaccid paraplegia in legs, absence of both ankle and knee jerks, loss of sensation in L4-S5 dermatomes (in lower extremities and an anogenital area) are observed.

- Make an initial diagnosis and prescribe examination and treatment.
- What are the major types of neurogenic bladder?

### **Task**

The patient is a 35 year old driver. He suffered from recurrent back pain for 4 years. 3 days ago he felt acute pain in the lower part of his back after lifting an heavy object. Pain irradiated to his right leg. Pain becomes worse when coughing and sneezing.

Objectively: the movements in the lumbar area are limited because of pain. Knee jerk reflexes are intact, left ankle jerk reflex is present, but the right one is absent. Reduction of muscle power of the right foot flexors is observed. Sensitivity of the lateral parts of the right foot and shin is decreased.

Make a diagnosis and prescribe the treatment for this patient.

**Task**

A 25 year old man was admitted 15 minutes ago. He got a blow on his face and lost consciousness for 2-3 minutes. When he regain his consciousness he couldn't understand what had happened. Now he complains of headache and nausea.

Objectively: pallor of the face, sweating of palms, postural tremor of fingers and instability in Romberg's test are observed.

- Make an initial diagnosis and prescribe examination.

**Task**

A 30 year old woman was hospitalized 2 hours after the accident. She was unconscious for 15 minutes after the trauma. Then she began to understand what she was asked about and became able to answer the questions, but was sleepy.

Objectively: perforation of the right tympanic septum and Bell's palsy were revealed.

Make an initial diagnosis and prescribe examination and treatment.

**Task**

The patient is a 55 year old woman. A week ago she fell down and damaged the back of the head. After that a headache and vomiting developed. Then she felt satisfactory for three days. But the day before yesterday headache appeared again and became more severe. The woman was not able to go to work yesterday. And today she has been taken to hospital by her relatives.

The examination showed the following: low level of consciousness (CGS = 10), widening of the right pupil, bradycardia and left side hemiparesis with Babinsky's sign.

- Make a primary diagnosis and prescribe examination and treatment.

**Task**

A 32 year-old woman complains of pain in her back and left leg. Three weeks earlier, while standing on a ladder to change a light bulb, she suddenly felt a pain in her left thigh. Later, sharp shooting pain spread down along the posterior side of the left leg to a heel.

Pain was worsened by sitting and standing. Weakness and numbness were denied. There were no sphincter symptoms. There was no history of trauma.

- What nerve(s) and roots are implicated in this woman's pain?
- Where weakness might be expected? What reflex might be lost?
- What are the "danger" symptoms of back pain which would argue for MRI and possible early surgery?
- Give a few etiologies for low back pain.

**Task**

A 28 year old patient fell asleep after alcohol abuse. When he woke up, he felt weakness in his left hand.

Objectively: radial deviation of the hand, weak wrist extension, weak extension of all digits, normal sensory findings are observed.

- Make a diagnosis and prescribe the treatment.

**Task**

A 56-year-old female was hospitalized with complaints of burning pain in shins and feet. For last five years she periodically felt thirsty, suffered from hunger and fatigue.

Objectively: loss of both superficial and deep sensations of the stocking type and absence of ankle reflexes. Systolic blood pressure falls down to 30 mm Hg. when she changes her position from horizontal to vertical one.

Make a diagnosis and prescribe the treatment.

**Task**

A 6 year-old boy presents to clinic for evaluation of "he straddles when he stands and waddles when he walks". These abnormalities were first noted about 2 years ago, but he walked late. He has pelvic and shoulder weakness but his calves appear hypertrophic. His brother, 2 maternal first cousins, and a maternal uncle all died after becoming wheel chair bound.

- What is the inheritance pattern exhibited in this pedigree?
- What is the clinical difference between Duchenne and Becker muscular dystrophy?
- Why are women only rarely affected with Duchenne's? How can the carrier status of an at risk female be determined?
- What is dystrophin?
- In the 1990s how could the clinical diagnosis of Duchenne's muscular dystrophy be confirmed most reliably?

### **Task**

A 35-year-old female presented with complaints of intermittent diplopia and ptosis, worse at the end of the day, for the last year. The diplopia fluctuated between horizontal, vertical and diagonal. She described her left eye as "lazy," and stated it had been getting progressively worse. Upon questioning, she complained of generalized muscle weakness, difficulty swallowing and breathing for the last three months.

1. List key signs and symptoms associated with systemic myasthenia gravis.
2. What history questions should one ask every patient suspected of having myasthenia gravis?
3. Describe the diagnostic tests for myasthenia gravis.
4. What are the classes of medication used to treat myasthenia gravis?
5. Describe the mechanism of action of the pharmaceutical agents involved in the treatment of myasthenia gravis.
6. What medications should be avoided in patients with myasthenia gravis?

### **Tasks for the assessment of competence "PC – 8":**

#### **Task**

A 72 year old woman was hospitalized with speech disorder, weakness in both her arm and leg and paralysis of a gaze. The disease began suddenly when she woke up in the morning. During last week she had two attacks of transient monocular blindness, which lasted for a few seconds.

Objectively: The level of consciousness was normal, but the woman could not speak. Her face was pale, blood pressure was 180/100 mm Hg, pulse was arrhythmical. There was motor aphasia, conjugate gaze deviation to the left, right side hemiparesis and positive Babinsky's sign.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

#### **Task**

A 45 year old man was admitted to clinic. His level of consciousness was reduced, with GCS =10. He had severe headache, vomiting and weakness in both his arm and leg. The disease has developed suddenly after emotional overstrain. Also the patient has been suffering from hypertension for a long time.

Objectively: the patient's face is red. His blood pressure is 220/120 mm Hg, and his pulse is 60 beats per minute. Neck muscles rigidity is about 3 cm, Kerning symptom is positive at an angle of 100°. The left pupil is dilated and right side hemiparesis and hemihyposesthesia are observed.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

### Task

A 35 year old man was admitted to the emergency room with confused state. The disease had an acute onset. It began suddenly with a very severe headache, after which the disturbance of consciousness and vomiting developed.

Objectively: there is delirium, neck muscles rigidity of 5 cm, Kerning's symptom. Focal neurologic symptoms are absent.

- Make an preliminary diagnosis
  - What examinations are necessary to verify a diagnosis?

### Task

How would you comment the following CSF?

- Pleocytosis is  $120/\text{mm}^3$
- Lymphocytes are  $100/\text{mm}^3$
- Polymorphonuclear leukocytes are  $20/\text{mm}^3$
- Proteins are 1.66 g/L
- Sugar content is 20 mg/dL
- CSF is cloudy with clots.

### Task

How would you comment the following CSF?

- CSF pressure is 400 mm H<sub>2</sub>O
- The CSF is cloudy and of yellow-green color
- Cytosis is  $2000/\text{mm}^3$  ; polymorphonuclear leukocytes (neutrophils) are prevailed
- Protein is 5,6 g/L
- Sugar content is 20 mg/dL.

### Task

A 36 year old woman was hospitalized with severe headache and weakness in both her left arm and leg. Disease has been developing gradually for 2 weeks. The woman has chronic infection in the middle ear.

Objectively: the patient is confused; body temperature is  $38,9^\circ$ . Left side spastic hemiparesis and papilledema are present.

Laboratory blood tests: the cell count and erythrocyte sedimentation rate are elevated.

The brain precontrast CT scan reveals an area of higher density than the surrounding edematous brain in the right frontal lobe. The contrast CT study demonstrates rim enhancing lesion with thickened capsule and hypodense central cavity.

- What is the diagnosis
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### Task

A 20 year old female complains of fever, chills, severe headache, nausea and vomiting. The onset of disease was acute

Objectively: level of consciousness is altered (GCS = 13). The body temperature is  $39^\circ\text{C}$ . There are petechiae on the skin. Fast pulse, shortness of breath and stiffness of neck muscles are present. Kernig's sign is positive.

- What is an preliminary diagnosis?
- What laboratory data are needed for the final diagnosis?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### Task

A 22 year old male patient has been suffering from weakness, irritability, headache, fever, vomiting and insomnia for 8 days. The last 2 days the visual acuity decreased and double vision appeared.

Objectively: body temperature is 37,8°C. Stiffness of neck muscles, positive Kernig's signs, incomplete bilateral ptosis, dilatation of both pupils and slight strabismus divergent are observed.

- What is a preliminary diagnosis
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

#### **Task**

**What structures of the brain and the spinal cord are not impaired by multiple sclerosis?**

- cranial nerves nuclei
- white matter of the brain in paraventricular localization
- peduncles of cerebellum
- spinal cord white matter
- corpus callosum

#### **Task**

**Which of the following CSF findings is least suggestive of acute multiple sclerosis?**

- an IgG index greater than 1.7
- increased myelin basic protein
- increased protein to 200 mg/dL
- presence of oligoclonal bands
- slight to moderate monocytic pleocytosis

#### **Task**

**Which of the following signs or symptoms occurring in a young person is the most suggestive of multiple sclerosis?**

- bilateral internuclear ophthalmoplegia
- gait ataxia
- Lhermitte's sign
- optic neuritis
- vertigo

#### **Task**

**Persons migrating from a zone with high risk of multiple sclerosis (MS) to one of low risk after age 15 show a risk of developing MS that is**

- equal to that of the high-risk zone
- equal to that of the low-risk zone
- intermediate between the two zones
- lower than that of the low-risk zone
- unpredictable

#### **Task**

**A 21-year-old right-handed female student was working in the photography lab 1 week ago, which required standing all day. After that, she experienced a cold sensation in the left foot and her entire left leg fell asleep. The feeling lasted 4 to 5 days and then slowly went away. Her right lower extremity was fine. Coughing, sneezing, and the Valsalva maneuver did not worsen her symptoms. She had a slight back pain, which she thought was due to using a poor mattress. Past history includes an episode of optic neuritis in the left eye 2 years ago. At that time, she**

was reportedly depressed and was sleeping constantly. One day, her left eye became blurred and her vision went out. In 1 week, her vision returned to normal.

Her vision now is 20/20. She has not had a repeat episode since then. She had an MRI of her brain, which was normal at that time. She drinks alcohol occasionally and does not use any illicit drugs. Her only medication is birth control pills. Examination is significant for brisk reflexes and sustained clonus at the right ankle. Babinski sign is present on the right. Testing is positive for oligoclonal bands. Which of the following is the most likely diagnosis in this case?

- Seizure
- Transient ischemic attack
- Anaplastic astrocytoma
- Multiple sclerosis
- Parkinson's disease

**What further examination is needed?**

**What results of examination are expected?**

### **Task**

**A patient has brought some test results from an outside doctor with her today. One of the results indicates that oligoclonal bands were positive. What are oligoclonal bands?**

- Wave frequency changes on the EEG during sleep
- Markings about the iris
- Pathologic features of Alzheimer's disease
- Chromosomal markings found with multiple sclerosis
- Immunoglobulin patterns in the cerebrospinal fluid with multiple sclerosis

### **Task**

**A 19-year-old man had an episode of left optic neuritis, which resolved over several weeks. Two years later there was a month long episode of bladder dysfunction. The patient underwent many tests and was told that he had multiple sclerosis. The cerebrospinal fluid in persons with multiple sclerosis will typically exhibit which of the following?**

- Glucose content of less than 20% of the serum content
- Persistently elevated total protein content
- Persistently elevated immunoglobulin G (IgG) content
- Mononuclear cell counts of greater than 100 cells per  $\mu\text{L}$
- Erythrocyte counts of greater than 10 cells per  $\mu\text{L}$

### **Task**

A 25 year old male patient has been suffering from chronic lymphadenopathy, weight loss, fever, and diarrhea for 2 months. Recently apathy, indifference, reduction of libido, poor concentration and memory impairment have developed.

Examination has revealed slight manifestation of Parkinsonism and ataxic gait.

- What preliminary diagnosis would you make?
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### **Task**

**A 9-year-old boy is brought to your clinic by his parents because he has begun to have episodes of eye fluttering lasting several seconds. Sometimes he loses track of his thoughts in the middle of a sentence. There was one fall off a bicycle that may have been related to one of these events. There are no other associated symptoms, and the episodes may occur up to 20 or more times**

per day. The boy's development and health have been normal up until this point. He did have two head injuries as a young child: the first when he fell off a tricycle onto the ground, and the second when he fell off of a playset onto his head. Both episodes resulted in a brief loss of consciousness and he did not think clearly for part of the day afterward, but had no medical intervention. Which of the following tests is most likely to confirm this patient's diagnosis?

- Brain CT scan
- Brain MRI
- Electroencephalogram
- Lumbar puncture
- Nerve conduction study

#### Task

A 19-year-old right-handed man who carries the diagnosis of epilepsy is seen in the urgent care clinic. He had been healthy until about age 12, when he began to have episodes of eye fluttering lasting several seconds. Sometimes he would lose track of his thoughts in the middle of a sentence. There was one fall off of a bicycle that may have been related to one of these events. He has been treated with valproic acid. At one point he was off all medications, but the seizures returned. He is now at the end of his first semester of college and came in today because he had a witnessed generalized tonic-clonic seizure this morning. He had had only about 2 hours of sleep the night before because he was studying for a final exam. Which of the following is the most appropriate thing to tell this patient?

- "I know that you faked this seizure to avoid taking a test."
- "Lack of sleep may have contributed to triggering this seizure."
- "You can expect to have tonic-clonic seizures on a regular basis from now on."
- "Your seizures are getting worse and there is nothing we can do about it."
- "You should take the next semester off to recover and get extensive testing."

#### Task

A 56-year-old man with epilepsy is brought into the emergency room. He has been having continuous generalized tonic-clonic seizures for the past 30 min. He is treated with 2 mg of intravenous lorazepam. Most physicians recommend using a high dose of intravenous benzodiazepine as part of the management of status epilepticus because it has which of the following qualities?

- Ability to suppress seizure activity for more than 24 h after one injection
- Lack of respiratory depressant action
- Rapid onset of action after intravenous administration
- Lack of hypotensive effects
- Lack of dependence on hepatic function for its metabolism and clearance
- 

#### Task

A 44-year-old man presents with left arm shaking. Two days ago, the patient noticed left arm paresthesias along the lateral aspect of his left arm and left fourth and fifth fingers while he was reading. He thinks he may have been leaning on his left arm at the time; the symptoms resolved after 30 seconds. This morning, he noted the same feelings, lasting a few seconds, but then his fourth and fifth fingers started shaking rhythmically, and the shaking then spread to all of his fingers, his hand, and then his arm up to his elbow. This episode lasted a total of 30 seconds. He denies any strange smells or tastes, visual changes, or weakness. Afterward, his fingers felt locked in position for a few seconds. Then he felt as if he did not have control of his hand and had difficulty donning his socks. He and his wife decided to drive to emergency room, and in the car he had trouble putting his seat belt latch into its socket. Examination and routine labs are normal. Which of the following is the most appropriate next action?

- Discharge the patient to follow up in clinic in 2 weeks
- Obtain a brain MRI

- Obtain an electroencephalogram
- Obtain an orthopedic consult
- Order electromyography and nerve conduction studies

**Task**

**A 4-year-old boy has the onset of episodes of loss of body tone, with associated falls, as well as generalized tonic-clonic seizures. His cognitive function has been deteriorating. EEG shows 1.5- to 2-Hz spike-and-wave discharges. Which of the following is the most likely diagnosis?**

- Landau-Kleffner syndrome
- Lennox-Gastaut syndrome
- Juvenile myoclonic epilepsy
- Mitochondrial encephalomyopathy
- Febrile seizures

**Task**

**A 27-year-old man begins to experience infrequent episodes of nausea, warmth rising through his body, and an unusual odor like rotting fish. His girlfriend notices that afterward he may develop twitching of the left side of his face and an inability to speak for several minutes. Afterward the man appears dazed and cannot remember what has occurred. He has otherwise been well. Magnetic resonance imaging of his brain is most likely to show a lesion in which of the following areas?**

- Left occipital lobe
- Right frontal lobe
- Cribriform plate
- Uncus
- Left parietal lobe

**Task**

**A 29-year-old man with a history of febrile seizures as a child has developed medication refractory focal seizures with impaired awareness within the past 2 years. An MRI reveals the small volume abnormality in the left temporal lobe. Which of the following is true regarding this condition?**

- This patient may benefit from a neurosurgical procedure
- The patient will probably die within 2 years
- The seizures will most likely stop with further medication titration
- A head CT should be performed
- A cerebral angiogram may confirm the diagnosis

**Task**

**A 37-year-old man develops involuntary twitching movements in his left thumb. Within 30 s, he notices that the twitching has spread to his entire left hand and that involuntary movements have developed in his left forearm and the left side of his face. He cannot recall what happened subsequently, but his wife reports that he fell down and the entire left side of his body appeared to be twitching. He appeared to be unresponsive for about 3 min and confused for another 15 min. During the episode, he bit his tongue and wet his pants. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic seizures
- Absence
- Focal seizure with impaired awareness
- Focal aware sensory seizure
- Jacksonian march

**Task**

**A 17-year-old boy reports involuntary jerking movements in his arms when he awakens. This has occurred during the day after a nap as well as in the morning after a full night's sleep. Over the next few months, he developed similar jerks during the day, even when he had been awake for several hours. He did not lose consciousness with these muscle jerks, but did occasionally fall. On one occasion, jerks in his legs caused a fall that resulted in a fractured wrist. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic seizures
- Absence
- Focal aware seizure
- Epilepsia partialis continua
- Myoclonic

#### **Task**

**A 21-year-old man reports several episodes over the previous 4 years during which he lost consciousness. He had no warning of the impending episodes, and with each episode he injured himself. Observers told him that he abruptly developed a blank stare and stopped talking. His body became stiff and he arched his back. After several seconds of this type of posturing, his arms and legs started shaking violently. During one of these episodes, he dislocated his right shoulder. He routinely bit his tongue and urinated in his pants during the episodes. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Generalized absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Focal aware sensory seizure

#### **Task**

**A 25-year-old woman was fired from her job after she misplaced papers vital for the company. She had had recurrent episodes for several years during which she performed nonsensical activities such as burying her plates in the backyard, hiding her underwear, and discarding her checkbook. She did not recall what she had done after performing these peculiar activities. She had been referred for psychotherapy, but the episodes became even more frequent after she was started on thioridazine (Mellaril). Her husband observed one episode and noted that she was unresponsive for about 5 min and confused for at least 1 h. She did not fall down or remain immobile during the episodes. As the episodes became more frequent, she noticed that she would develop an unpleasant taste in her mouth, reminiscent of motor oil, just before an episode. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Myoclonic

#### **Task**

**A 21-year-old cocaine-abusing man develops seizures that persist for more than 30 min before emergency medical attention is available. When examined nearly 1 h later, he is still exhibiting tonic-clonic movements and has never recovered consciousness. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Generalized absence
- Jacksonian march
- Tonic-clonic status epilepticus

#### **Task**

A 38-year-old patient has been suffering from morning headache for a year. The headache decreases at daytime. During the last months the headache became severe and vomiting appeared. Over the last few weeks the weakness the left extremities developed.

Objectively: papilledema and left-side hemiparesis are observed.

- Make an initial diagnosis. What is the future examination.

### **Task**

The patient is a 45-year-old man. Relatives noticed the changes in his behavior: inappropriate humor, impaired ability to judgments, gait abnormalities and urinary incontinence. The patient complains of constant headache and vomiting which begins each morning before he rise from bed.

Objectively: inappropriate behavior, loss of smell sense and papilledema were revealed. Gait was noticed to be without any signs of cerebellar ataxia.

- What clinical syndromes may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis ? Justify your decision

### **Task**

The 48-year-old woman complains of headaches, fatigue, muscular pains, vision disturbances and amenorrhea. She notes that she is not able longer to put on rings that used to fit and that her shoe size has progressively increased.

Objectively: enlarged hands and feet, prominent supraorbital ridges, protruded mandible, separated teeth and thick lips, enlarged tongue. Bitemporal hemianopsia.

- Make an preliminary diagnosis.
- Explain the pathophysiological mechanism of bitemporal hemianopsia
- What examinations are necessary to verify a diagnosis?

### **Task**

The 46-year-old woman has been suffering from progressive unilateral right side loss of hearing for two years. Tinnitus, unstable gait and systemic dizziness appeared half a year ago. Facial numbness and facial weakness developed two weeks ago.

Objectively: papilledema, nystagmus, right side deafness, facial weakness on the right side, intentional tremor and ataxic gait were observed.

- What clinical syndromes may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### **Task**

A 45-year-old woman complains of pain and paresthesias in the left side of the thorax and weakness in the left leg. Pain appeared two months ago. Her doctor made a diagnosis of “osteochondrosis” and prescribed anti-inflammatory drugs and physiotherapy. However, pains were growing worse, aggravating at coughing, sneezing and movements of the trunk. The pains were unbearable when the woman was lying down. Last week weakness in her left leg appeared.

Objectively: left leg weakness associated with spasticity, high tendon reflexes and positive Babinsky’s symptom was revealed. Decreased pain sensation from the right rib arc to the heel and decreased proprioceptive sensation in the left leg were also observed. Tenderness when tapped over the Th6 spinous process was present.

- What clinical syndrome may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?

- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### Task

The patient is a 45-year-old man. He complains of severe pain, numbness and tingling in the buttocks and legs, weakness in legs, and incontinence of bladder and bowels.

These disorders evolved slowly during last 4 months.

Objectively: asymmetric flaccid paraplegia in legs, absence of both ankle and knee jerks, loss of sensation in L4-S5 dermatomes (in lower extremities and an anogenital area) are observed.

- Make an initial diagnosis and prescribe examination and treatment.
- What are the major types of neurogenic bladder?

### Task

The patient is a 35 year old driver. He suffered from recurrent back pain for 4 years. 3 days ago he felt acute pain in the lower part of his back after lifting an heavy object. Pain irradiated to his right leg. Pain becomes worse when coughing and sneezing.

Objectively: the movements in the lumbar area are limited because of pain. Knee jerk reflexes are intact, left ankle jerk reflex is present, but the right one is absent. Reduction of muscle power of the right foot flexors is observed. Sensitivity of the lateral parts of the right foot and shin is decreased.

Make a diagnosis and prescribe the treatment for this patient.

### Task

A 25 year old man was admitted 15 minutes ago. He got a blow on his face and lost consciousness for 2-3 minutes. When he regain his consciousness he couldn't understand what had happened. Now he complains of headache and nausea.

Objectively: pallor of the face, sweating of palms, postural tremor of fingers and instability in Romberg's test are observed.

- Make an initial diagnosis and prescribe examination.

### Task

A 30 year old woman was hospitalized 2 hours after the accident. She was unconscious for 15 minutes after the trauma. Then she began to understand what she was asked about and became able to answer the questions, but was sleepy.

Objectively: perforation of the right tympanic septum and Bell's palsy were revealed.

Make an initial diagnosis and prescribe examination and treatment.

### Task

The patient is a 55 year old woman. A week ago she fell down and damaged the back of the head. After that a headache and vomiting developed. Then she felt satisfactory for three days. But the day before yesterday headache appeared again and became more severe. The woman was not able to go to work yesterday. And today she has been taken to hospital by her relatives.

The examination showed the following: low level of consciousness (CGS = 10), widening of the right pupil, bradycardia and left side hemiparesis with Babinsky's sign.

- Make a primary diagnosis and prescribe examination and treatment.

### Task

A 32 year-old woman complains of pain in her back and left leg. Three weeks earlier, while standing on a ladder to change a light bulb, she suddenly felt a pain in her left thigh. Later, sharp shooting pain spread down along the posterior side of the left leg to a heel.

Pain was worsened by sitting and standing. Weakness and numbness were denied. There were no sphincter symptoms. There was no history of trauma.

- What nerve(s) and roots are implicated in this woman's pain?
- Where weakness might be expected? What reflex might be lost?

- What are the "danger" symptoms of back pain which would argue for MRI and possible early surgery?
- Give a few etiologies for low back pain.

### Task

A 28 year old patient fell asleep after alcohol abuse. When he woke up, he felt weakness in his left hand.

Objectively: radial deviation of the hand, weak wrist extension, weak extension of all digits, normal sensory findings are observed.

- Make a diagnosis and prescribe the treatment.

### Task

A 56-year-old female was hospitalized with complaints of burning pain in shins and feet. For last five years she periodically felt thirsty, suffered from hunger and fatigue.

Objectively: loss of both superficial and deep sensations of the stocking type and absence of ankle reflexes. Systolic blood pressure falls down to 30 mm Hg. when she changes her position from horizontal to vertical one.

Make a diagnosis and prescribe the treatment.

### Task

A 6 year-old boy presents to clinic for evaluation of "he straddles when he stands and waddles when he walks". These abnormalities were first noted about 2 years ago, but he walked late. He has pelvic and shoulder weakness but his calves appear hypertrophic. His brother, 2 maternal first cousins, and a maternal uncle all died after becoming wheel chair bound.

- What is the inheritance pattern exhibited in this pedigree?
- What is the clinical difference between Duchenne and Becker muscular dystrophy?
- Why are women only rarely affected with Duchenne's? How can the carrier status of an at risk female be determined?
- What is dystrophin?
- In the 1990s how could the clinical diagnosis of Duchenne's muscular dystrophy be confirmed most reliably?

### Task

A 35-year-old female presented with complaints of intermittent diplopia and ptosis, worse at the end of the day, for the last year. The diplopia fluctuated between horizontal, vertical and diagonal. She described her left eye as "lazy," and stated it had been getting progressively worse. Upon questioning, she complained of generalized muscle weakness, difficulty swallowing and breathing for the last three months.

1. List key signs and symptoms associated with systemic myasthenia gravis.
2. What history questions should one ask every patient suspected of having myasthenia gravis?
3. Describe the diagnostic tests for myasthenia gravis.
4. What are the classes of medication used to treat myasthenia gravis?
5. Describe the mechanism of action of the pharmaceutical agents involved in the treatment of myasthenia gravis.
6. What medications should be avoided in patients with myasthenia gravis?

### Tasks for the assessment of competence "PC – 10":

#### Task

A 72 year old woman was hospitalized with speech disorder, weakness in both her arm and leg and paralysis of a gaze. The disease began suddenly when she woke up in the morning. During last week she had two attacks of transient monocular blindness, which lasted for a few seconds.

Objectively: The level of consciousness was normal, but the woman could not speak. Her face was pale, blood pressure was 180/100 mm Hg, pulse was arrhythmical. There was motor aphasia, conjugate gaze deviation to the left, right side hemiparesis and positive Babinsky's sign.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

### Task

A 45 year old man was admitted to clinic. His level of consciousness was reduced, with GCS =10. He had severe headache, vomiting and weakness in both his arm and leg. The disease has developed suddenly after emotional overstrain. Also the patient has been suffering from hypertension for a long time.

Objectively: the patient's face is red. His blood pressure is 220/120 mm Hg, and his pulse is 60 beats per minute. Neck muscles rigidity is about 3 cm, Kerning symptom is positive at an angle of 100°. The left pupil is dilated and right side hemiparesis and hemyhyposthesia are observed.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

### Task

A 35 year old man was admitted to the emergency room with confused state. The disease had an acute onset. It began suddenly with a very severe headache, after which the disturbance of consciousness and vomiting developed.

Objectively: there is delirium, neck muscles rigidity of 5 cm, Kerning's symptom. Focal neurologic symptoms are absent.

- Make an preliminary diagnosis
  - What examinations are necessary to verify a diagnosis?

### Task

How would you comment the following CSF?

- Pleocytosis is 120/mm<sup>3</sup>
- Lymphocytes are 100/ mm<sup>3</sup>
- Polymorphonuclear leukocytes are 20/ mm<sup>3</sup>
- Proteins are 1.66 g/L
- Sugar content is 20 mg/dL
- CSF is cloudy with clots.

### Task

How would you comment the following CSF?

- CSF pressure is 400 mm H<sub>2</sub>O
- The CSF is cloudy and of yellow-green color
- Cytosis is 2000/ mm<sup>3</sup> ; polymorphonuclear leukocytes (neutrophils) are prevailed
- Protein is 5,6 g/L
- Sugar content is 20 mg/dL.

### Task

A 36 year old woman was hospitalized with severe headache and weakness in both her left arm and leg. Disease has been developing gradually for 2 weeks. The woman has chronic infection in the middle ear.

Objectively: the patient is confused; body temperature is 38,9°. Left side spastic hemiparesis and papilledema are present.

Laboratory blood tests: the cell count and erythrocyte sedimentation rate are elevated.

The brain precontrast CT scan reveals an area of higher density than the surrounding edematous brain in the right frontal lobe. The contrast CT study demonstrates rim enhancing lesion with thickened capsule and hypodense central cavity.

- What is the diagnosis
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

#### **Task**

A 20 year old female complains of fever, chills, severe headache, nausea and vomiting. The onset of disease was acute

Objectively: level of consciousness is altered (GCS = 13). The body temperature is 39°C. There are petechiae on the skin. Fast pulse, shortness of breath and stiffness of neck muscles are present. Kernig's sign is positive.

- What is an preliminary diagnosis?
- What laboratory data are needed for the final diagnosis?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

#### **Task**

A 22 year old male patient has been suffering from weakness, irritability, headache, fever, vomiting and insomnia for 8 days. The last 2 days the visual acuity decreased and double vision appeared.

Objectively: body temperature is 37,8°C. Stiffness of neck muscles, positive Kernig's signs, incomplete bilateral ptosis, dilatation of both pupils and slight strabismus divergent are observed.

- What is a preliminary diagnosis
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

#### **Task**

**What structures of the brain and the spinal cord are not impaired by multiple sclerosis?**

- cranial nerves nuclei
- white matter of the brain in paraventricular localization
- peduncles of cerebellum
- spinal cord white matter
- corpus callosum

#### **Task**

**Which of the following CSF findings is least suggestive of acute multiple sclerosis?**

- an IgG index greater than 1.7
- increased myelin basic protein
- increased protein to 200 mg/dL
- presence of oligoclonal bands
- slight to moderate monocytic pleocytosis

#### **Task**

**Which of the following signs or symptoms occurring in a young person is the most suggestive of multiple sclerosis?**

- bilateral internuclear ophthalmoplegia
- gait ataxia
- Lhermitte's sign

- optic neuritis
- vertigo

### Task

**Persons migrating from a zone with high risk of multiple sclerosis (MS) to one of low risk after age 15 show a risk of developing MS that is**

- equal to that of the high-risk zone
- equal to that of the low-risk zone
- intermediate between the two zones
- lower than that of the low-risk zone
- unpredictable

### Task

**A 21-year-old right-handed female student was working in the photography lab 1 week ago, which required standing all day. After that, she experienced a cold sensation in the left foot and her entire left leg fell asleep. The feeling lasted 4 to 5 days and then slowly went away. Her right lower extremity was fine. Coughing, sneezing, and the Valsalva maneuver did not worsen her symptoms. She had a slight back pain, which she thought was due to using a poor mattress. Past history includes an episode of optic neuritis in the left eye 2 years ago. At that time, she was reportedly depressed and was sleeping constantly. One day, her left eye became blurred and her vision went out. In 1 week, her vision returned to normal.**

**Her vision now is 20/20. She has not had a repeat episode since then. She had an MRI of her brain, which was normal at that time. She drinks alcohol occasionally and does not use any illicit drugs. Her only medication is birth control pills. Examination is significant for brisk reflexes and sustained clonus at the right ankle. Babinski sign is present on the right. Testing is positive for oligoclonal bands. Which of the following is the most likely diagnosis in this case?**

- Seizure
- Transient ischemic attack
- Anaplastic astrocytoma
- Multiple sclerosis
- Parkinson's disease

**What further examination is needed?**

**What results of examination are expected?**

### Task

**A patient has brought some test results from an outside doctor with her today. One of the results indicates that oligoclonal bands were positive. What are oligoclonal bands?**

- Wave frequency changes on the EEG during sleep
- Markings about the iris
- Pathologic features of Alzheimer's disease
- Chromosomal markings found with multiple sclerosis
- Immunoglobulin patterns in the cerebrospinal fluid with multiple sclerosis

### Task

**A 19-year-old man had an episode of left optic neuritis, which resolved over several weeks. Two years later there was a month long episode of bladder dysfunction. The patient underwent many tests and was told that he had multiple sclerosis. The cerebrospinal fluid in persons with multiple sclerosis will typically exhibit which of the following?**

- Glucose content of less than 20% of the serum content
- Persistently elevated total protein content
- Persistently elevated immunoglobulin G (IgG) content
- Mononuclear cell counts of greater than 100 cells per  $\mu\text{L}$
- Erythrocyte counts of greater than 10 cells per  $\mu\text{L}$

### **Task**

A 25 year old male patient has been suffering from chronic lymphadenopathy, weight loss, fever, and diarrhea for 2 months. Recently apathy, indifference, reduction of libido, poor concentration and memory impairment have developed.

Examination has revealed slight manifestation of Parkinsonism and ataxic gait.

- What preliminary diagnosis would you make?
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### **Task**

**A 9-year-old boy is brought to your clinic by his parents because he has begun to have episodes of eye fluttering lasting several seconds. Sometimes he loses track of his thoughts in the middle of a sentence. There was one fall off a bicycle that may have been related to one of these events. There are no other associated symptoms, and the episodes may occur up to 20 or more times per day. The boy's development and health have been normal up until this point. He did have two head injuries as a young child: the first when he fell off a tricycle onto the ground, and the second when he fell off of a playset onto his head. Both episodes resulted in a brief loss of consciousness and he did not think clearly for part of the day afterward, but had no medical intervention. Which of the following tests is most likely to confirm this patient's diagnosis?**

- Brain CT scan
- Brain MRI
- Electroencephalogram
- Lumbar puncture
- Nerve conduction study

### **Task**

**A 19-year-old right-handed man who carries the diagnosis of epilepsy is seen in the urgent care clinic. He had been healthy until about age 12, when he began to have episodes of eye fluttering lasting several seconds. Sometimes he would lose track of his thoughts in the middle of a sentence. There was one fall off of a bicycle that may have been related to one of these events. He has been treated with valproic acid. At one point he was off all medications, but the seizures returned. He is now at the end of his first semester of college and came in today because he had a witnessed generalized tonic-clonic seizure this morning. He had had only about 2 hours of sleep the night before because he was studying for a final exam. Which of the following is the most appropriate thing to tell this patient?**

- "I know that you faked this seizure to avoid taking a test."
- "Lack of sleep may have contributed to triggering this seizure."
- "You can expect to have tonic-clonic seizures on a regular basis from now on."
- "Your seizures are getting worse and there is nothing we can do about it."
- "You should take the next semester off to recover and get extensive testing."

### **Task**

**A 56-year-old man with epilepsy is brought into the emergency room. He has been having continuous generalized tonic-clonic seizures for the past 30 min. He is treated with 2 mg of intravenous lorazepam. Most physicians recommend using a high dose of intravenous benzodiazepine as part of the management of status epilepticus because it has which of the following qualities?**

- Ability to suppress seizure activity for more than 24 h after one injection
- Lack of respiratory depressant action

- Rapid onset of action after intravenous administration
- Lack of hypotensive effects
- Lack of dependence on hepatic function for its metabolism and clearance
- 

#### Task

**A 44-year-old man presents with left arm shaking. Two days ago, the patient noticed left arm paresthesias along the lateral aspect of his left arm and left fourth and fifth fingers while he was reading. He thinks he may have been leaning on his left arm at the time; the symptoms resolved after 30 seconds. This morning, he noted the same feelings, lasting a few seconds, but then his fourth and fifth fingers started shaking rhythmically, and the shaking then spread to all of his fingers, his hand, and then his arm up to his elbow. This episode lasted a total of 30 seconds. He denies any strange smells or tastes, visual changes, or weakness. Afterward, his fingers felt locked in position for a few seconds. Then he felt as if he did not have control of his hand and had difficulty donning his socks. He and his wife decided to drive to emergency room, and in the car he had trouble putting his seat belt latch into its socket. Examination and routine labs are normal. Which of the following is the most appropriate next action?**

- Discharge the patient to follow up in clinic in 2 weeks
- Obtain a brain MRI
- Obtain an electroencephalogram
- Obtain an orthopedic consult
- Order electromyography and nerve conduction studies

#### Task

**A 4-year-old boy has the onset of episodes of loss of body tone, with associated falls, as well as generalized tonic-clonic seizures. His cognitive function has been deteriorating. EEG shows 1.5- to 2-Hz spike-and-wave discharges. Which of the following is the most likely diagnosis?**

- Landau-Kleffner syndrome
- Lennox-Gastaut syndrome
- Juvenile myoclonic epilepsy
- Mitochondrial encephalomyopathy
- Febrile seizures

#### Task

**A 27-year-old man begins to experience infrequent episodes of nausea, warmth rising through his body, and an unusual odor like rotting fish. His girlfriend notices that afterward he may develop twitching of the left side of his face and an inability to speak for several minutes. Afterward the man appears dazed and cannot remember what has occurred. He has otherwise been well. Magnetic resonance imaging of his brain is most likely to show a lesion in which of the following areas?**

- Left occipital lobe
- Right frontal lobe
- Cribriform plate
- Uncus
- Left parietal lobe

#### Task

**A 29-year-old man with a history of febrile seizures as a child has developed medication refractory focal seizures with impaired awareness within the past 2 years. An MRI reveals the small volume abnormality in the left temporal lobe. Which of the following is true regarding this condition?**

- This patient may benefit from a neurosurgical procedure
- The patient will probably die within 2 years
- The seizures will most likely stop with further medication titration

- A head CT should be performed
- A cerebral angiogram may confirm the diagnosis

### Task

**A 37-year-old man develops involuntary twitching movements in his left thumb. Within 30 s, he notices that the twitching has spread to his entire left hand and that involuntary movements have developed in his left forearm and the left side of his face. He cannot recall what happened subsequently, but his wife reports that he fell down and the entire left side of his body appeared to be twitching. He appeared to be unresponsive for about 3 min and confused for another 15 min. During the episode, he bit his tongue and wet his pants. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic seizures
- Absence
- Focal seizure with impaired awareness
- Focal aware sensory seizure
- Jacksonian march

### Task

**A 17-year-old boy reports involuntary jerking movements in his arms when he awakens. This has occurred during the day after a nap as well as in the morning after a full night's sleep. Over the next few months, he developed similar jerks during the day, even when he had been awake for several hours. He did not lose consciousness with these muscle jerks, but did occasionally fall. On one occasion, jerks in his legs caused a fall that resulted in a fractured wrist. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic seizures
- Absence
- Focal aware seizure
- Epilepsia partialis continua
- Myoclonic

### Task

**A 21-year-old man reports several episodes over the previous 4 years during which he lost consciousness. He had no warning of the impending episodes, and with each episode he injured himself. Observers told him that he abruptly developed a blank stare and stopped talking. His body became stiff and he arched his back. After several seconds of this type of posturing, his arms and legs started shaking violently. During one of these episodes, he dislocated his right shoulder. He routinely bit his tongue and urinated in his pants during the episodes. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Generalized absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Focal aware sensory seizure

### Task

**A 25-year-old woman was fired from her job after she misplaced papers vital for the company. She had had recurrent episodes for several years during which she performed nonsensical activities such as burying her plates in the backyard, hiding her underwear, and discarding her checkbook. She did not recall what she had done after performing these peculiar activities. She had been referred for psychotherapy, but the episodes became even more frequent after she was started on thioridazine (Mellaril). Her husband observed one episode and noted that she was unresponsive for about 5 min and confused for at least 1 h. She did not fall down or remain immobile during the episodes. As the episodes became more frequent, she noticed that**

she would develop an unpleasant taste in her mouth, reminiscent of motor oil, just before an episode. Choose the seizure type that best explains the patient's complaints.

- Generalized tonic-clonic
- Absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Myoclonic

#### Task

A 21-year-old cocaine-abusing man develops seizures that persist for more than 30 min before emergency medical attention is available. When examined nearly 1 h later, he is still exhibiting tonic-clonic movements and has never recovered consciousness. Choose the seizure type that best explains the patient's complaints.

- Generalized tonic-clonic
- Generalized absence
- Jacksonian march
- Tonic-clonic status epilepticus

#### Task

A 38-year-old patient has been suffering from morning headache for a year. The headache decreases at daytime. During the last months the headache became severe and vomiting appeared. Over the last few weeks the weakness the left extremities developed.

Objectively: papilledema and left-side hemiparesis are observed.

- Make an initial diagnosis. What is the future examination.

#### Task

The patient is a 45-year-old man. Relatives noticed the changes in his behavior: inappropriate humor, impaired ability to judgments, gait abnormalities and urinary incontinence. The patient complains of constant headache and vomiting which begins each morning before he rise from bed.

Objectively: inappropriate behavior, loss of smell sense and papilledema were revealed. Gait was noticed to be without any signs of cerebellar ataxia.

- What clinical syndromes may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis ? Justify your decision

#### Task

The 48-year-old woman complains of headaches, fatigue, muscular pains, vision disturbances and amenorrhea. She notes that she is not able longer to put on rings that used to fit and that her shoe size has progressively increased.

Objectively: enlarged hands and feet, prominent supraorbital ridges, protruded mandible, separated teeth and thick lips, enlarged tongue. Bitemporal hemianopsia.

- Make an preliminary diagnosis.
- Explain the pathophysiological mechanism of bitemporal hemianopsia
- What examinations are necessary to verify a diagnosis?

#### Task

The 46-year-old woman has been suffering from progressive unilateral right side loss of hearing for two years. Tinnitus, unstable gait and systemic dizziness appeared half a year ago. Facial numbness and facial weakness developed two weeks ago.

Objectively: papilledema, nystagmus, right side deafness, facial weakness on the right side, intentional tremor and ataxic gait were observed.

- What clinical syndromes may be diagnosed in the patient?

- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### **Task**

A 45-year-old woman complains of pain and paresthesias in the left side of the thorax and weakness in the left leg. Pain appeared two months ago. Her doctor made a diagnosis of “osteochondrosis” and prescribed anti-inflammatory drugs and physiotherapy. However, pains were growing worse, aggravating at coughing, sneezing and movements of the trunk. The pains were unbearable when the woman was lying down. Last week weakness in her left leg appeared. Objectively: left leg weakness associated with spasticity, high tendon reflexes and positive Babinsky’s symptom was revealed. Decreased pain sensation from the right rib arc to the heel and decreased proprioceptive sensation in the left leg were also observed. Tenderness when tapped over the Th6 spinous process was present.

- What clinical syndrome may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### **Task**

The patient is a 45-year-old man. He complains of severe pain, numbness and tingling in the buttocks and legs, weakness in legs, and incontinence of bladder and bowels.

These disorders evolved slowly during last 4 months.

Objectively: asymmetric flaccid paraplegia in legs, absence of both ankle and knee jerks, loss of sensation in L4-S5 dermatomes (in lower extremities and an anogenital area) are observed.

- Make an initial diagnosis and prescribe examination and treatment.
- What are the major types of neurogenic bladder?

### **Task**

The patient is a 35 year old driver. He suffered from recurrent back pain for 4 years. 3 days ago he felt acute pain in the lower part of his back after lifting a heavy object. Pain irradiated to his right leg. Pain becomes worse when coughing and sneezing.

Objectively: the movements in the lumbar area are limited because of pain. Knee jerk reflexes are intact, left ankle jerk reflex is present, but the right one is absent. Reduction of muscle power of the right foot flexors is observed. Sensitivity of the lateral parts of the right foot and shin is decreased.

Make a diagnosis and prescribe the treatment for this patient.

### **Task**

A 25 year old man was admitted 15 minutes ago. He got a blow on his face and lost consciousness for 2-3 minutes. When he regain his consciousness he couldn’t understand what had happened. Now he complains of headache and nausea.

Objectively: pallor of the face, sweating of palms, postural tremor of fingers and instability in Romberg’s test are observed.

- Make an initial diagnosis and prescribe examination.

### **Task**

A 30 year old woman was hospitalized 2 hours after the accident. She was unconscious for 15 minutes after the trauma. Then she began to understand what she was asked about and became able to answer the questions, but was sleepy.

Objectively: perforation of the right tympanic septum and Bell’s palsy were revealed.

Make an initial diagnosis and prescribe examination and treatment.

**Task**

The patient is a 55 year old woman. A week ago she fell down and damaged the back of the head. After that a headache and vomiting developed. Then she felt satisfactory for three days. But the day before yesterday headache appeared again and became more severe. The woman was not able to go to work yesterday. And today she has been taken to hospital by her relatives.

The examination showed the following: low level of consciousness (CGS = 10), widening of the right pupil, bradycardia and left side hemiparesis with Babinsky's sign.

- Make a primary diagnosis and prescribe examination and treatment.

**Task**

A 32 year-old woman complains of pain in her back and left leg. Three weeks earlier, while standing on a ladder to change a light bulb, she suddenly felt a pain in her left thigh. Later, sharp shooting pain spread down along the posterior side of the left leg to a heel.

Pain was worsened by sitting and standing. Weakness and numbness were denied. There were no sphincter symptoms. There was no history of trauma.

- What nerve(s) and roots are implicated in this woman's pain?
- Where weakness might be expected? What reflex might be lost?
- What are the "danger" symptoms of back pain which would argue for MRI and possible early surgery?
- Give a few etiologies for low back pain.

**Task**

A 28 year old patient fell asleep after alcohol abuse. When he woke up, he felt weakness in his left hand.

Objectively: radial deviation of the hand, weak wrist extension, weak extension of all digits, normal sensory findings are observed.

- Make a diagnosis and prescribe the treatment.

**Task**

A 56-year-old female was hospitalized with complaints of burning pain in shins and feet. For last five years she periodically felt thirsty, suffered from hunger and fatigue.

Objectively: loss of both superficial and deep sensations of the stocking type and absence of ankle reflexes. Systolic blood pressure falls down to 30 mm Hg. when she changes her position from horizontal to vertical one.

Make a diagnosis and prescribe the treatment.

**Task**

A 6 year-old boy presents to clinic for evaluation of "he straddles when he stands and waddles when he walks". These abnormalities were first noted about 2 years ago, but he walked late. He has pelvic and shoulder weakness but his calves appear hypertrophic. His brother, 2 maternal first cousins, and a maternal uncle all died after becoming wheel chair bound.

- What is the inheritance pattern exhibited in this pedigree?
- What is the clinical difference between Duchenne and Becker muscular dystrophy?
- Why are women only rarely affected with Duchenne's? How can the carrier status of an at risk female be determined?
- What is dystrophin?
- In the 1990s how could the clinical diagnosis of Duchenne's muscular dystrophy be confirmed most reliably?

**Task**

A 35-year-old female presented with complaints of intermittent diplopia and ptosis, worse at the end of the day, for the last year. The diplopia fluctuated between horizontal, vertical and

diagonal. She described her left eye as “lazy,” and stated it had been getting progressively worse. Upon questioning, she complained of generalized muscle weakness, difficulty swallowing and breathing for the last three months.

1. List key signs and symptoms associated with systemic myasthenia gravis.
2. What history questions should one ask every patient suspected of having myasthenia gravis?
3. Describe the diagnostic tests for myasthenia gravis.
4. What are the classes of medication used to treat myasthenia gravis?
5. Describe the mechanism of action of the pharmaceutical agents involved in the treatment of myasthenia gravis.
6. What medications should be avoided in patients with myasthenia gravis?

### **Tasks for the assessment of competence "PC – 11":**

#### **Task**

A 72 year old woman was hospitalized with speech disorder, weakness in both her arm and leg and paralysis of a gaze. The disease began suddenly when she woke up in the morning. During last week she had two attacks of transient monocular blindness, which lasted for a few seconds.

Objectively: The level of consciousness was normal, but the woman could not speak. Her face was pale, blood pressure was 180/100 mm Hg, pulse was arrhythmical. There was motor aphasia, conjugate gaze deviation to the left, right side hemiparesis and positive Babinsky's sign.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

#### **Task**

A 45 year old man was admitted to clinic. His level of consciousness was reduced, with GCS =10. He had severe headache, vomiting and weakness in both his arm and leg. The disease has developed suddenly after emotional overstrain. Also the patient has been suffering from hypertension for a long time.

Objectively: the patient's face is red. His blood pressure is 220/120 mm Hg, and his pulse is 60 beats per minute. Neck muscles rigidity is about 3 cm, Kerning symptom is positive at an angle of 100°. The left pupil is dilated and right side hemiparesis and hemihyposesthesia are observed.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

#### **Task**

A 35 year old man was admitted to the emergency room with confused state. The disease had an acute onset. It began suddenly with a very severe headache, after which the disturbance of consciousness and vomiting developed.

Objectively: there is delirium, neck muscles rigidity of 5 cm, Kerning's symptom. Focal neurologic symptoms are absent.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?

#### **Task**

How would you comment the following CSF?

- Pleocytosis is 120/mm<sup>3</sup>
- Lymphocytes are 100/ mm<sup>3</sup>
- Polymorphonuclear leukocytes are 20/ mm<sup>3</sup>
- Proteins are 1.66 g/L
- Sugar content is 20 mg/dL
- CSF is cloudy with clots.

### Task

How would you comment the following CSF?

- CSF pressure is 400 mm H<sub>2</sub>O
- The CSF is cloudy and of yellow-green color
- Cytosis is 2000/ mm<sup>3</sup> ; polymorphonuclear leukocytes (neutrophils) are prevailed
- Protein is 5,6 g/L
- Sugar content is 20 mg/dL.

### Task

A 36 year old woman was hospitalized with severe headache and weakness in both her left arm and leg. Disease has been developing gradually for 2 weeks. The woman has chronic infection in the middle ear.

Objectively: the patient is confused; body temperature is 38,9°. Left side spastic hemiparesis and papilledema are present.

Laboratory blood tests: the cell count and erythrocyte sedimentation rate are elevated.

The brain precontrast CT scan reveals an area of higher density than the surrounding edematous brain in the right frontal lobe. The contrast CT study demonstrates rim enhancing lesion with thickened capsule and hypodense central cavity.

- What is the diagnosis
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### Task

A 20 year old female complains of fever, chills, severe headache, nausea and vomiting. The onset of disease was acute

Objectively: level of consciousness is altered (GCS = 13). The body temperature is 39°C. There are petechiae on the skin. Fast pulse, shortness of breath and stiffness of neck muscles are present. Kernig's sign is positive.

- What is an preliminary diagnosis?
- What laboratory data are needed for the final diagnosis?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### Task

A 22 year old male patient has been suffering from weakness, irritability, headache, fever, vomiting and insomnia for 8 days. The last 2 days the visual acuity decreased and double vision appeared.

Objectively: body temperature is 37,8°C. Stiffness of neck muscles, positive Kernig's signs, incomplete bilateral ptosis, dilatation of both pupils and slight strabismus divergent are observed.

- What is a preliminary diagnosis
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### Task

**What structures of the brain and the spinal cord are not impaired by multiple sclerosis?**

- cranial nerves nuclei
- white matter of the brain in paraventricular localization
- peduncles of cerebellum
- spinal cord white matter

- corpus callosum

**Task**

**Which of the following CSF findings is least suggestive of acute multiple sclerosis?**

- an IgG index greater than 1.7
- increased myelin basic protein
- increased protein to 200 mg/dL
- presence of oligoclonal bands
- slight to moderate monocytic pleocytosis

**Task**

**Which of the following signs or symptoms occurring in a young person is the most suggestive of multiple sclerosis?**

- bilateral internuclear ophthalmoplegia
- gait ataxia
- Lhermitte's sign
- optic neuritis
- vertigo

**Task**

**Persons migrating from a zone with high risk of multiple sclerosis (MS) to one of low risk after age 15 show a risk of developing MS that is**

- equal to that of the high-risk zone
- equal to that of the low-risk zone
- intermediate between the two zones
- lower than that of the low-risk zone
- unpredictable

**Task**

**A 21-year-old right-handed female student was working in the photography lab 1 week ago, which required standing all day. After that, she experienced a cold sensation in the left foot and her entire left leg fell asleep. The feeling lasted 4 to 5 days and then slowly went away. Her right lower extremity was fine. Coughing, sneezing, and the Valsalva maneuver did not worsen her symptoms. She had a slight back pain, which she thought was due to using a poor mattress. Past history includes an episode of optic neuritis in the left eye 2 years ago. At that time, she was reportedly depressed and was sleeping constantly. One day, her left eye became blurred and her vision went out. In 1 week, her vision returned to normal.**

**Her vision now is 20/20. She has not had a repeat episode since then. She had an MRI of her brain, which was normal at that time. She drinks alcohol occasionally and does not use any illicit drugs. Her only medication is birth control pills. Examination is significant for brisk reflexes and sustained clonus at the right ankle. Babinski sign is present on the right. Testing is positive for oligoclonal bands. Which of the following is the most likely diagnosis in this case?**

- Seizure
- Transient ischemic attack
- Anaplastic astrocytoma
- Multiple sclerosis
- Parkinson's disease

**What further examination is needed?**

**What results of examination are expected?**

**Task**

**A patient has brought some test results from an outside doctor with her today. One of the results indicates that oligoclonal bands were positive. What are oligoclonal bands?**

- Wave frequency changes on the EEG during sleep

- Markings about the iris
- Pathologic features of Alzheimer's disease
- Chromosomal markings found with multiple sclerosis
- Immunoglobulin patterns in the cerebrospinal fluid with multiple sclerosis

#### Task

**A 19-year-old man had an episode of left optic neuritis, which resolved over several weeks. Two years later there was a month long episode of bladder dysfunction. The patient underwent many tests and was told that he had multiple sclerosis. The cerebrospinal fluid in persons with multiple sclerosis will typically exhibit which of the following?**

- Glucose content of less than 20% of the serum content
- Persistently elevated total protein content
- Persistently elevated immunoglobulin G (IgG) content
- Mononuclear cell counts of greater than 100 cells per  $\mu\text{L}$
- Erythrocyte counts of greater than 10 cells per  $\mu\text{L}$

#### Task

A 25 year old male patient has been suffering from chronic lymphadenopathy, weight loss, fever, and diarrhea for 2 months. Recently apathy, indifference, reduction of libido, poor concentration and memory impairment have developed.

Examination has revealed slight manifestation of Parkinsonism and ataxic gait.

- What preliminary diagnosis would you make?
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

#### Task

**A 9-year-old boy is brought to your clinic by his parents because he has begun to have episodes of eye fluttering lasting several seconds. Sometimes he loses track of his thoughts in the middle of a sentence. There was one fall off a bicycle that may have been related to one of these events. There are no other associated symptoms, and the episodes may occur up to 20 or more times per day. The boy's development and health have been normal up until this point. He did have two head injuries as a young child: the first when he fell off a tricycle onto the ground, and the second when he fell off of a playset onto his head. Both episodes resulted in a brief loss of consciousness and he did not think clearly for part of the day afterward, but had no medical intervention. Which of the following tests is most likely to confirm this patient's diagnosis?**

- Brain CT scan
- Brain MRI
- Electroencephalogram
- Lumbar puncture
- Nerve conduction study

#### Task

**A 19-year-old right-handed man who carries the diagnosis of epilepsy is seen in the urgent care clinic. He had been healthy until about age 12, when he began to have episodes of eye fluttering lasting several seconds. Sometimes he would lose track of his thoughts in the middle of a sentence. There was one fall off of a bicycle that may have been related to one of these events. He has been treated with valproic acid. At one point he was off all medications, but the seizures returned. He is now at the end of his first semester of college and came in today because he had a witnessed generalized tonic-clonic seizure this morning. He had had only about 2 hours of**

**sleep the night before because he was studying for a final exam. Which of the following is the most appropriate thing to tell this patient?**

- “I know that you faked this seizure to avoid taking a test.”
- “Lack of sleep may have contributed to triggering this seizure.”
- “You can expect to have tonic-clonic seizures on a regular basis from now on.”
- “Your seizures are getting worse and there is nothing we can do about it.”
- “You should take the next semester off to recover and get extensive testing.”

#### **Task**

**A 56-year-old man with epilepsy is brought into the emergency room. He has been having continuous generalized tonic-clonic seizures for the past 30 min. He is treated with 2 mg of intravenous lorazepam. Most physicians recommend using a high dose of intravenous benzodiazepine as part of the management of status epilepticus because it has which of the following qualities?**

- Ability to suppress seizure activity for more than 24 h after one injection
- Lack of respiratory depressant action
- Rapid onset of action after intravenous administration
- Lack of hypotensive effects
- Lack of dependence on hepatic function for its metabolism and clearance
- 

#### **Task**

**A 44-year-old man presents with left arm shaking. Two days ago, the patient noticed left arm paresthesias along the lateral aspect of his left arm and left fourth and fifth fingers while he was reading. He thinks he may have been leaning on his left arm at the time; the symptoms resolved after 30 seconds. This morning, he noted the same feelings, lasting a few seconds, but then his fourth and fifth fingers started shaking rhythmically, and the shaking then spread to all of his fingers, his hand, and then his arm up to his elbow. This episode lasted a total of 30 seconds. He denies any strange smells or tastes, visual changes, or weakness. Afterward, his fingers felt locked in position for a few seconds. Then he felt as if he did not have control of his hand and had difficulty donning his socks. He and his wife decided to drive to emergency room, and in the car he had trouble putting his seat belt latch into its socket. Examination and routine labs are normal. Which of the following is the most appropriate next action?**

- Discharge the patient to follow up in clinic in 2 weeks
- Obtain a brain MRI
- Obtain an electroencephalogram
- Obtain an orthopedic consult
- Order electromyography and nerve conduction studies

#### **Task**

**A 4-year-old boy has the onset of episodes of loss of body tone, with associated falls, as well as generalized tonic-clonic seizures. His cognitive function has been deteriorating. EEG shows 1.5- to 2-Hz spike-and-wave discharges. Which of the following is the most likely diagnosis?**

- Landau-Kleffner syndrome
- Lennox-Gastaut syndrome
- Juvenile myoclonic epilepsy
- Mitochondrial encephalomyopathy
- Febrile seizures

#### **Task**

**A 27-year-old man begins to experience infrequent episodes of nausea, warmth rising through his body, and an unusual odor like rotting fish. His girlfriend notices that afterward he may develop twitching of the left side of his face and an inability to speak for several minutes. Afterward the man appears dazed and cannot remember what has occurred. He has otherwise**

been well. Magnetic resonance imaging of his brain is most likely to show a lesion in which of the following areas?

- Left occipital lobe
- Right frontal lobe
- Cribriform plate
- Uncus
- Left parietal lobe

#### Task

A 29-year-old man with a history of febrile seizures as a child has developed medication refractory focal seizures with impaired awareness within the past 2 years. An MRI reveals the small volume abnormality in the left temporal lobe. Which of the following is true regarding this condition?

- This patient may benefit from a neurosurgical procedure
- The patient will probably die within 2 years
- The seizures will most likely stop with further medication titration
- A head CT should be performed
- A cerebral angiogram may confirm the diagnosis

#### Task

A 37-year-old man develops involuntary twitching movements in his left thumb. Within 30 s, he notices that the twitching has spread to his entire left hand and that involuntary movements have developed in his left forearm and the left side of his face. He cannot recall what happened subsequently, but his wife reports that he fell down and the entire left side of his body appeared to be twitching. He appeared to be unresponsive for about 3 min and confused for another 15 min. During the episode, he bit his tongue and wet his pants. Choose the seizure type that best explains the patient's complaints.

- Generalized tonic-clonic seizures
- Absence
- Focal seizure with impaired awareness
- Focal aware sensory seizure
- Jacksonian march

#### Task

A 17-year-old boy reports involuntary jerking movements in his arms when he awakens. This has occurred during the day after a nap as well as in the morning after a full night's sleep. Over the next few months, he developed similar jerks during the day, even when he had been awake for several hours. He did not lose consciousness with these muscle jerks, but did occasionally fall. On one occasion, jerks in his legs caused a fall that resulted in a fractured wrist. Choose the seizure type that best explains the patient's complaints.

- Generalized tonic-clonic seizures
- Absence
- Focal aware seizure
- Epilepsia partialis continua
- Myoclonic

#### Task

A 21-year-old man reports several episodes over the previous 4 years during which he lost consciousness. He had no warning of the impending episodes, and with each episode he injured himself. Observers told him that he abruptly developed a blank stare and stopped talking. His body became stiff and he arched his back. After several seconds of this type of posturing, his arms and legs started shaking violently. During one of these episodes, he dislocated his right shoulder. He routinely bit his tongue and urinated in his pants during the episodes. Choose the seizure type that best explains the patient's complaints.

- Generalized tonic-clonic
- Generalized absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Focal aware sensory seizure

### Task

**A 25-year-old woman was fired from her job after she misplaced papers vital for the company. She had had recurrent episodes for several years during which she performed nonsensical activities such as burying her plates in the backyard, hiding her underwear, and discarding her checkbook. She did not recall what she had done after performing these peculiar activities. She had been referred for psychotherapy, but the episodes became even more frequent after she was started on thioridazine (Mellaril). Her husband observed one episode and noted that she was unresponsive for about 5 min and confused for at least 1 h. She did not fall down or remain immobile during the episodes. As the episodes became more frequent, she noticed that she would develop an unpleasant taste in her mouth, reminiscent of motor oil, just before an episode. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Myoclonic

### Task

**A 21-year-old cocaine-abusing man develops seizures that persist for more than 30 min before emergency medical attention is available. When examined nearly 1 h later, he is still exhibiting tonic-clonic movements and has never recovered consciousness. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Generalized absence
- Jacksonian march
- Tonic-clonic status epilepticus

### Task

A 38-year-old patient has been suffering from morning headache for a year. The headache decreases at daytime. During the last months the headache became severe and vomiting appeared. Over the last few weeks the weakness the left extremities developed.

Objectively: papilledema and left-side hemiparesis are observed.

- Make an initial diagnosis. What is the future examination.

### Task

The patient is a 45-year-old man. Relatives noticed the changes in his behavior: inappropriate humor, impaired ability to judgments, gait abnormalities and urinary incontinence. The patient complains of constant headache and vomiting which begins each morning before he rise from bed.

Objectively: inappropriate behavior, loss of smell sense and papilledema were revealed. Gait was noticed to be without any signs of cerebellar ataxia.

- What clinical syndromes may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis ? Justify your decision

### Task

The 48-year-old woman complains of headaches, fatigue, muscular pains, vision disturbances and amenorrhea. She notes that she is not able longer to put on rings that used to fit and that her shoe size has progressively increased.

Objectively: enlarged hands and feet, prominent supraorbital ridges, protruded mandible, separated teeth and thick lips, enlarged tongue. Bitemporal hemianopsia.

- Make an preliminary diagnosis.
- Explain the pathophysiological mechanism of bitemporal hemianopsia
- What examinations are necessary to verify a diagnosis?

### **Task**

The 46-year-old woman has been suffering from progressive unilateral right side loss of hearing for two years. Tinnitus, unstable gait and systemic dizziness appeared half a year ago. Facial numbness and facial weakness developed two weeks ago.

Objectively: papilledema, nystagmus, right side deafness, facial weakness on the right side, intentional tremor and ataxic gait were observed.

- What clinical syndromes may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### **Task**

A 45-year-old woman complains of pain and paresthesias in the left side of the thorax and weakness in the left leg. Pain appeared two months ago. Her doctor made a diagnosis of “osteochondrosis” and prescribed anti-inflammatory drugs and physiotherapy. However, pains were growing worse, aggravating at coughing, sneezing and movements of the trunk. The pains were unbearable when the woman was lying down. Last week weakness in her left leg appeared.

Objectively: left leg weakness associated with spasticity, high tendon reflexes and positive Babinsky’s symptom was revealed. Decreased pain sensation from the right rib arc to the heel and decreased proprioceptive sensation in the left leg were also observed. Tenderness when tapped over the Th6 spinous process was present.

- What clinical syndrome may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### **Task**

The patient is a 45-year-old man. He complains of severe pain, numbness and tingling in the buttocks and legs, weakness in legs, and incontinence of bladder and bowels.

These disorders evolved slowly during last 4 months.

Objectively: asymmetric flaccid paraplegia in legs, absence of both ankle and knee jerks, loss of sensation in L4-S5 dermatomes (in lower extremities and an anogenital area) are observed.

- Make an initial diagnosis and prescribe examination and treatment.
- What are the major types of neurogenic bladder?

### **Task**

The patient is a 35 year old driver. He suffered from recurrent back pain for 4 years. 3 days ago he felt acute pain in the lower part of his back after lifting an heavy object. Pain irradiated to his right leg. Pain becomes worse when coughing and sneezing.

Objectively: the movements in the lumbar area are limited because of pain. Knee jerk reflexes are intact, left ankle jerk reflex is present, but the right one is absent. Reduction of muscle power of the right foot flexors is observed. Sensitivity of the lateral parts of the right foot and shin is decreased.

Make a diagnosis and prescribe the treatment for this patient.

**Task**

A 25 year old man was admitted 15 minutes ago. He got a blow on his face and lost consciousness for 2-3 minutes. When he regain his consciousness he couldn't understand what had happened. Now he complains of headache and nausea.

Objectively: pallor of the face, sweating of palms, postural tremor of fingers and instability in Romberg's test are observed.

- Make an initial diagnosis and prescribe examination.

**Task**

A 30 year old woman was hospitalized 2 hours after the accident. She was unconscious for 15 minutes after the trauma. Then she began to understand what she was asked about and became able to answer the questions, but was sleepy.

Objectively: perforation of the right tympanic septum and Bell's palsy were revealed.

Make an initial diagnosis and prescribe examination and treatment.

**Task**

The patient is a 55 year old woman. A week ago she fell down and damaged the back of the head. After that a headache and vomiting developed. Then she felt satisfactory for three days. But the day before yesterday headache appeared again and became more severe. The woman was not able to go to work yesterday. And today she has been taken to hospital by her relatives.

The examination showed the following: low level of consciousness (CGS = 10), widening of the right pupil, bradycardia and left side hemiparesis with Babinsky's sign.

- Make a primary diagnosis and prescribe examination and treatment.

**Task**

A 32 year-old woman complains of pain in her back and left leg. Three weeks earlier, while standing on a ladder to change a light bulb, she suddenly felt a pain in her left thigh. Later, sharp shooting pain spread down along the posterior side of the left leg to a heel.

Pain was worsened by sitting and standing. Weakness and numbness were denied. There were no sphincter symptoms. There was no history of trauma.

- What nerve(s) and roots are implicated in this woman's pain?
- Where weakness might be expected? What reflex might be lost?
- What are the "danger" symptoms of back pain which would argue for MRI and possible early surgery?
- Give a few etiologies for low back pain.

**Task**

A 28 year old patient fell asleep after alcohol abuse. When he woke up, he felt weakness in his left hand.

Objectively: radial deviation of the hand, weak wrist extension, weak extension of all digits, normal sensory findings are observed.

- Make a diagnosis and prescribe the treatment.

**Task**

A 56-year-old female was hospitalized with complaints of burning pain in shins and feet. For last five years she periodically felt thirsty, suffered from hunger and fatigue.

Objectively: loss of both superficial and deep sensations of the stocking type and absence of ankle reflexes. Systolic blood pressure falls down to 30 mm Hg. when she changes her position from horizontal to vertical one.

Make a diagnosis and prescribe the treatment.

**Task**

A 6 year-old boy presents to clinic for evaluation of "he straddles when he stands and waddles when he walks". These abnormalities were first noted about 2 years ago, but he walked late. He has pelvic and shoulder weakness but his calves appear hypertrophic. His brother, 2 maternal first cousins, and a maternal uncle all died after becoming wheel chair bound.

- What is the inheritance pattern exhibited in this pedigree?
- What is the clinical difference between Duchenne and Becker muscular dystrophy?
- Why are women only rarely affected with Duchenne's? How can the carrier status of an at risk female be determined?
- What is dystrophin?
- In the 1990s how could the clinical diagnosis of Duchenne's muscular dystrophy be confirmed most reliably?

### **Task**

A 35-year-old female presented with complaints of intermittent diplopia and ptosis, worse at the end of the day, for the last year. The diplopia fluctuated between horizontal, vertical and diagonal. She described her left eye as "lazy," and stated it had been getting progressively worse. Upon questioning, she complained of generalized muscle weakness, difficulty swallowing and breathing for the last three months.

1. List key signs and symptoms associated with systemic myasthenia gravis.
2. What history questions should one ask every patient suspected of having myasthenia gravis?
3. Describe the diagnostic tests for myasthenia gravis.
4. What are the classes of medication used to treat myasthenia gravis?
5. Describe the mechanism of action of the pharmaceutical agents involved in the treatment of myasthenia gravis.
6. What medications should be avoided in patients with myasthenia gravis?

### **Tasks for the assessment of competence "PC – 14":**

### **Task**

A 72 year old woman was hospitalized with speech disorder, weakness in both her arm and leg and paralysis of a gaze. The disease began suddenly when she woke up in the morning. During last week she had two attacks of transient monocular blindness, which lasted for a few seconds.

Objectively: The level of consciousness was normal, but the woman could not speak. Her face was pale, blood pressure was 180/100 mm Hg, pulse was arrhythmical. There was motor aphasia, conjugate gaze deviation to the left, right side hemiparesis and positive Babinsky's sign.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

### **Task**

A 45 year old man was admitted to clinic. His level of consciousness was reduced, with GCS =10. He had severe headache, vomiting and weakness in both his arm and leg. The disease has developed suddenly after emotional overstrain. Also the patient has been suffering from hypertension for a long time.

Objectively: the patient's face is red. His blood pressure is 220/120 mm Hg, and his pulse is 60 beats per minute. Neck muscles rigidity is about 3 cm, Kerning symptom is positive at an angle of 100°. The left pupil is dilated and right side hemiparesis and hemihypoesthesia are observed.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

### **Task**

A 35 year old man was admitted to the emergency room with confused state. The disease had an acute onset. It began suddenly with a very severe headache, after which the disturbance of consciousness and vomiting developed.

Objectively: there is delirium, neck muscles rigidity of 5 cm, Kerning's symptom. Focal neurologic symptoms are absent.

- Make an preliminary diagnosis
  - What examinations are necessary to verify a diagnosis?

### Task

How would you comment the following CSF?

- Pleocytosis is 120/mm<sup>3</sup>
- Lymphocytes are 100/ mm<sup>3</sup>
- Polymorphonuclear leukocytes are 20/ mm<sup>3</sup>
- Proteins are 1.66 g/L
- Sugar content is 20 mg/dL
- CSF is cloudy with clots.

### Task

How would you comment the following CSF?

- CSF pressure is 400 mm H<sub>2</sub>O
- The CSF is cloudy and of yellow-green color
- Cytosis is 2000/ mm<sup>3</sup> ; polymorphonuclear leukocytes (neutrophils) are prevailed
- Protein is 5,6 g/L
- Sugar content is 20 mg/dL.

### Task

A 36 year old woman was hospitalized with severe headache and weakness in both her left arm and leg. Disease has been developing gradually for 2 weeks. The woman has chronic infection in the middle ear.

Objectively: the patient is confused; body temperature is 38,9°. Left side spastic hemiparesis and papilledema are present.

Laboratory blood tests: the cell count and erythrocyte sedimentation rate are elevated.

The brain precontrast CT scan reveals an area of higher density than the surrounding edematous brain in the right frontal lobe. The contrast CT study demonstrates rim enhancing lesion with thickened capsule and hypodense central cavity.

- What is the diagnosis
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### Task

A 20 year old female complains of fever, chills, severe headache, nausea and vomiting. The onset of disease was acute

Objectively: level of consciousness is altered (GCS = 13). The body temperature is 39°C. There are petechiae on the skin. Fast pulse, shortness of breath and stiffness of neck muscles are present. Kernig's sign is positive.

- What is an preliminary diagnosis?
- What laboratory data are needed for the final diagnosis?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### Task

A 22 year old male patient has been suffering from weakness, irritability, headache, fever, vomiting and insomnia for 8 days. The last 2 days the visual acuity decreased and double vision appeared.

Objectively: body temperature is 37,8°C. Stiffness of neck muscles, positive Kernig's signs, incomplete bilateral ptosis, dilatation of both pupils and slight strabismus divergent are observed.

- What is a preliminary diagnosis
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

#### **Task**

**What structures of the brain and the spinal cord are not impaired by multiple sclerosis?**

- cranial nerves nuclei
- white matter of the brain in paraventricular localization
- peduncles of cerebellum
- spinal cord white matter
- corpus callosum

#### **Task**

**Which of the following CSF findings is least suggestive of acute multiple sclerosis?**

- an IgG index greater than 1.7
- increased myelin basic protein
- increased protein to 200 mg/dL
- presence of oligoclonal bands
- slight to moderate monocytic pleocytosis

#### **Task**

**Which of the following signs or symptoms occurring in a young person is the most suggestive of multiple sclerosis?**

- bilateral internuclear ophthalmoplegia
- gait ataxia
- Lhermitte's sign
- optic neuritis
- vertigo

#### **Task**

**Persons migrating from a zone with high risk of multiple sclerosis (MS) to one of low risk after age 15 show a risk of developing MS that is**

- equal to that of the high-risk zone
- equal to that of the low-risk zone
- intermediate between the two zones
- lower than that of the low-risk zone
- unpredictable

#### **Task**

**A 21-year-old right-handed female student was working in the photography lab 1 week ago, which required standing all day. After that, she experienced a cold sensation in the left foot and her entire left leg fell asleep. The feeling lasted 4 to 5 days and then slowly went away. Her right lower extremity was fine. Coughing, sneezing, and the Valsalva maneuver did not worsen her symptoms. She had a slight back pain, which she thought was due to using a poor mattress. Past history includes an episode of optic neuritis in the left eye 2 years ago. At that time, she**

was reportedly depressed and was sleeping constantly. One day, her left eye became blurred and her vision went out. In 1 week, her vision returned to normal.

Her vision now is 20/20. She has not had a repeat episode since then. She had an MRI of her brain, which was normal at that time. She drinks alcohol occasionally and does not use any illicit drugs. Her only medication is birth control pills. Examination is significant for brisk reflexes and sustained clonus at the right ankle. Babinski sign is present on the right. Testing is positive for oligoclonal bands. Which of the following is the most likely diagnosis in this case?

- Seizure
- Transient ischemic attack
- Anaplastic astrocytoma
- Multiple sclerosis
- Parkinson's disease

**What further examination is needed?**

**What results of examination are expected?**

#### **Task**

**A patient has brought some test results from an outside doctor with her today. One of the results indicates that oligoclonal bands were positive. What are oligoclonal bands?**

- Wave frequency changes on the EEG during sleep
- Markings about the iris
- Pathologic features of Alzheimer's disease
- Chromosomal markings found with multiple sclerosis
- Immunoglobulin patterns in the cerebrospinal fluid with multiple sclerosis

#### **Task**

**A 19-year-old man had an episode of left optic neuritis, which resolved over several weeks. Two years later there was a month long episode of bladder dysfunction. The patient underwent many tests and was told that he had multiple sclerosis. The cerebrospinal fluid in persons with multiple sclerosis will typically exhibit which of the following?**

- Glucose content of less than 20% of the serum content
- Persistently elevated total protein content
- Persistently elevated immunoglobulin G (IgG) content
- Mononuclear cell counts of greater than 100 cells per  $\mu\text{L}$
- Erythrocyte counts of greater than 10 cells per  $\mu\text{L}$

#### **Task**

A 25 year old male patient has been suffering from chronic lymphadenopathy, weight loss, fever, and diarrhea for 2 months. Recently apathy, indifference, reduction of libido, poor concentration and memory impairment have developed.

Examination has revealed slight manifestation of Parkinsonism and ataxic gait.

- What preliminary diagnosis would you make?
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

#### **Task**

**A 9-year-old boy is brought to your clinic by his parents because he has begun to have episodes of eye fluttering lasting several seconds. Sometimes he loses track of his thoughts in the middle of a sentence. There was one fall off a bicycle that may have been related to one of these events. There are no other associated symptoms, and the episodes may occur up to 20 or more times**

per day. The boy's development and health have been normal up until this point. He did have two head injuries as a young child: the first when he fell off a tricycle onto the ground, and the second when he fell off of a playset onto his head. Both episodes resulted in a brief loss of consciousness and he did not think clearly for part of the day afterward, but had no medical intervention. Which of the following tests is most likely to confirm this patient's diagnosis?

- Brain CT scan
- Brain MRI
- Electroencephalogram
- Lumbar puncture
- Nerve conduction study

#### Task

A 19-year-old right-handed man who carries the diagnosis of epilepsy is seen in the urgent care clinic. He had been healthy until about age 12, when he began to have episodes of eye fluttering lasting several seconds. Sometimes he would lose track of his thoughts in the middle of a sentence. There was one fall off of a bicycle that may have been related to one of these events. He has been treated with valproic acid. At one point he was off all medications, but the seizures returned. He is now at the end of his first semester of college and came in today because he had a witnessed generalized tonic-clonic seizure this morning. He had had only about 2 hours of sleep the night before because he was studying for a final exam. Which of the following is the most appropriate thing to tell this patient?

- "I know that you faked this seizure to avoid taking a test."
- "Lack of sleep may have contributed to triggering this seizure."
- "You can expect to have tonic-clonic seizures on a regular basis from now on."
- "Your seizures are getting worse and there is nothing we can do about it."
- "You should take the next semester off to recover and get extensive testing."

#### Task

A 56-year-old man with epilepsy is brought into the emergency room. He has been having continuous generalized tonic-clonic seizures for the past 30 min. He is treated with 2 mg of intravenous lorazepam. Most physicians recommend using a high dose of intravenous benzodiazepine as part of the management of status epilepticus because it has which of the following qualities?

- Ability to suppress seizure activity for more than 24 h after one injection
- Lack of respiratory depressant action
- Rapid onset of action after intravenous administration
- Lack of hypotensive effects
- Lack of dependence on hepatic function for its metabolism and clearance
- 

#### Task

A 44-year-old man presents with left arm shaking. Two days ago, the patient noticed left arm paresthesias along the lateral aspect of his left arm and left fourth and fifth fingers while he was reading. He thinks he may have been leaning on his left arm at the time; the symptoms resolved after 30 seconds. This morning, he noted the same feelings, lasting a few seconds, but then his fourth and fifth fingers started shaking rhythmically, and the shaking then spread to all of his fingers, his hand, and then his arm up to his elbow. This episode lasted a total of 30 seconds. He denies any strange smells or tastes, visual changes, or weakness. Afterward, his fingers felt locked in position for a few seconds. Then he felt as if he did not have control of his hand and had difficulty donning his socks. He and his wife decided to drive to emergency room, and in the car he had trouble putting his seat belt latch into its socket. Examination and routine labs are normal. Which of the following is the most appropriate next action?

- Discharge the patient to follow up in clinic in 2 weeks
- Obtain a brain MRI

- Obtain an electroencephalogram
- Obtain an orthopedic consult
- Order electromyography and nerve conduction studies

**Task**

**A 4-year-old boy has the onset of episodes of loss of body tone, with associated falls, as well as generalized tonic-clonic seizures. His cognitive function has been deteriorating. EEG shows 1.5- to 2-Hz spike-and-wave discharges. Which of the following is the most likely diagnosis?**

- Landau-Kleffner syndrome
- Lennox-Gastaut syndrome
- Juvenile myoclonic epilepsy
- Mitochondrial encephalomyopathy
- Febrile seizures

**Task**

**A 27-year-old man begins to experience infrequent episodes of nausea, warmth rising through his body, and an unusual odor like rotting fish. His girlfriend notices that afterward he may develop twitching of the left side of his face and an inability to speak for several minutes. Afterward the man appears dazed and cannot remember what has occurred. He has otherwise been well. Magnetic resonance imaging of his brain is most likely to show a lesion in which of the following areas?**

- Left occipital lobe
- Right frontal lobe
- Cribriform plate
- Uncus
- Left parietal lobe

**Task**

**A 29-year-old man with a history of febrile seizures as a child has developed medication refractory focal seizures with impaired awareness within the past 2 years. An MRI reveals the small volume abnormality in the left temporal lobe. Which of the following is true regarding this condition?**

- This patient may benefit from a neurosurgical procedure
- The patient will probably die within 2 years
- The seizures will most likely stop with further medication titration
- A head CT should be performed
- A cerebral angiogram may confirm the diagnosis

**Task**

**A 37-year-old man develops involuntary twitching movements in his left thumb. Within 30 s, he notices that the twitching has spread to his entire left hand and that involuntary movements have developed in his left forearm and the left side of his face. He cannot recall what happened subsequently, but his wife reports that he fell down and the entire left side of his body appeared to be twitching. He appeared to be unresponsive for about 3 min and confused for another 15 min. During the episode, he bit his tongue and wet his pants. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic seizures
- Absence
- Focal seizure with impaired awareness
- Focal aware sensory seizure
- Jacksonian march

**Task**

**A 17-year-old boy reports involuntary jerking movements in his arms when he awakens. This has occurred during the day after a nap as well as in the morning after a full night's sleep. Over the next few months, he developed similar jerks during the day, even when he had been awake for several hours. He did not lose consciousness with these muscle jerks, but did occasionally fall. On one occasion, jerks in his legs caused a fall that resulted in a fractured wrist. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic seizures
- Absence
- Focal aware seizure
- Epilepsia partialis continua
- Myoclonic

#### **Task**

**A 21-year-old man reports several episodes over the previous 4 years during which he lost consciousness. He had no warning of the impending episodes, and with each episode he injured himself. Observers told him that he abruptly developed a blank stare and stopped talking. His body became stiff and he arched his back. After several seconds of this type of posturing, his arms and legs started shaking violently. During one of these episodes, he dislocated his right shoulder. He routinely bit his tongue and urinated in his pants during the episodes. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Generalized absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Focal aware sensory seizure

#### **Task**

**A 25-year-old woman was fired from her job after she misplaced papers vital for the company. She had had recurrent episodes for several years during which she performed nonsensical activities such as burying her plates in the backyard, hiding her underwear, and discarding her checkbook. She did not recall what she had done after performing these peculiar activities. She had been referred for psychotherapy, but the episodes became even more frequent after she was started on thioridazine (Mellaril). Her husband observed one episode and noted that she was unresponsive for about 5 min and confused for at least 1 h. She did not fall down or remain immobile during the episodes. As the episodes became more frequent, she noticed that she would develop an unpleasant taste in her mouth, reminiscent of motor oil, just before an episode. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Myoclonic

#### **Task**

**A 21-year-old cocaine-abusing man develops seizures that persist for more than 30 min before emergency medical attention is available. When examined nearly 1 h later, he is still exhibiting tonic-clonic movements and has never recovered consciousness. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Generalized absence
- Jacksonian march
  - Tonic-clonic status epilepticus

#### **Task**

A 38-year-old patient has been suffering from morning headache for a year. The headache decreases at daytime. During the last months the headache became severe and vomiting appeared. Over the last few weeks the weakness the left extremities developed.

Objectively: papilledema and left-side hemiparesis are observed.

- Make an initial diagnosis. What is the future examination.

### **Task**

The patient is a 45-year-old man. Relatives noticed the changes in his behavior: inappropriate humor, impaired ability to judgments, gait abnormalities and urinary incontinence. The patient complains of constant headache and vomiting which begins each morning before he rise from bed.

Objectively: inappropriate behavior, loss of smell sense and papilledema were revealed. Gait was noticed to be without any signs of cerebellar ataxia.

- What clinical syndromes may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis ? Justify your decision

### **Task**

The 48-year-old woman complains of headaches, fatigue, muscular pains, vision disturbances and amenorrhea. She notes that she is not able longer to put on rings that used to fit and that her shoe size has progressively increased.

Objectively: enlarged hands and feet, prominent supraorbital ridges, protruded mandible, separated teeth and thick lips, enlarged tongue. Bitemporal hemianopsia.

- Make an preliminary diagnosis.
- Explain the pathophysiological mechanism of bitemporal hemianopsia
- What examinations are necessary to verify a diagnosis?

### **Task**

The 46-year-old woman has been suffering from progressive unilateral right side loss of hearing for two years. Tinnitus, unstable gait and systemic dizziness appeared half a year ago. Facial numbness and facial weakness developed two weeks ago.

Objectively: papilledema, nystagmus, right side deafness, facial weakness on the right side, intentional tremor and ataxic gait were observed.

- What clinical syndromes may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### **Task**

A 45-year-old woman complains of pain and paresthesias in the left side of the thorax and weakness in the left leg. Pain appeared two months ago. Her doctor made a diagnosis of “osteochondrosis” and prescribed anti-inflammatory drugs and physiotherapy. However, pains were growing worse, aggravating at coughing, sneezing and movements of the trunk. The pains were unbearable when the woman was lying down. Last week weakness in her left leg appeared.

Objectively: left leg weakness associated with spasticity, high tendon reflexes and positive Babinsky’s symptom was revealed. Decreased pain sensation from the right rib arc to the heel and decreased proprioceptive sensation in the left leg were also observed. Tenderness when tapped over the Th6 spinous process was present.

- What clinical syndrome may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?

- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### Task

The patient is a 45-year-old man. He complains of severe pain, numbness and tingling in the buttocks and legs, weakness in legs, and incontinence of bladder and bowels.

These disorders evolved slowly during last 4 months.

Objectively: asymmetric flaccid paraplegia in legs, absence of both ankle and knee jerks, loss of sensation in L4-S5 dermatomes (in lower extremities and an anogenital area) are observed.

- Make an initial diagnosis and prescribe examination and treatment.
- What are the major types of neurogenic bladder?

### Task

The patient is a 35 year old driver. He suffered from recurrent back pain for 4 years. 3 days ago he felt acute pain in the lower part of his back after lifting an heavy object. Pain irradiated to his right leg. Pain becomes worse when coughing and sneezing.

Objectively: the movements in the lumbar area are limited because of pain. Knee jerk reflexes are intact, left ankle jerk reflex is present, but the right one is absent. Reduction of muscle power of the right foot flexors is observed. Sensitivity of the lateral parts of the right foot and shin is decreased.

Make a diagnosis and prescribe the treatment for this patient.

### Task

A 25 year old man was admitted 15 minutes ago. He got a blow on his face and lost consciousness for 2-3 minutes. When he regain his consciousness he couldn't understand what had happened. Now he complains of headache and nausea.

Objectively: pallor of the face, sweating of palms, postural tremor of fingers and instability in Romberg's test are observed.

- Make an initial diagnosis and prescribe examination.

### Task

A 30 year old woman was hospitalized 2 hours after the accident. She was unconscious for 15 minutes after the trauma. Then she began to understand what she was asked about and became able to answer the questions, but was sleepy.

Objectively: perforation of the right tympanic septum and Bell's palsy were revealed.

Make an initial diagnosis and prescribe examination and treatment.

### Task

The patient is a 55 year old woman. A week ago she fell down and damaged the back of the head. After that a headache and vomiting developed. Then she felt satisfactory for three days. But the day before yesterday headache appeared again and became more severe. The woman was not able to go to work yesterday. And today she has been taken to hospital by her relatives.

The examination showed the following: low level of consciousness (CGS = 10), widening of the right pupil, bradycardia and left side hemiparesis with Babinsky's sign.

- Make a primary diagnosis and prescribe examination and treatment.

### Task

A 32 year-old woman complains of pain in her back and left leg. Three weeks earlier, while standing on a ladder to change a light bulb, she suddenly felt a pain in her left thigh. Later, sharp shooting pain spread down along the posterior side of the left leg to a heel.

Pain was worsened by sitting and standing. Weakness and numbness were denied. There were no sphincter symptoms. There was no history of trauma.

- What nerve(s) and roots are implicated in this woman's pain?
- Where weakness might be expected? What reflex might be lost?

- What are the "danger" symptoms of back pain which would argue for MRI and possible early surgery?
- Give a few etiologies for low back pain.

### Task

A 28 year old patient fell asleep after alcohol abuse. When he woke up, he felt weakness in his left hand.

Objectively: radial deviation of the hand, weak wrist extension, weak extension of all digits, normal sensory findings are observed.

- Make a diagnosis and prescribe the treatment.

### Task

A 56-year-old female was hospitalized with complaints of burning pain in shins and feet. For last five years she periodically felt thirsty, suffered from hunger and fatigue.

Objectively: loss of both superficial and deep sensations of the stocking type and absence of ankle reflexes. Systolic blood pressure falls down to 30 mm Hg. when she changes her position from horizontal to vertical one.

- 3) Make a diagnosis and prescribe the treatment.

### Task

A 6 year-old boy presents to clinic for evaluation of "he straddles when he stands and waddles when he walks". These abnormalities were first noted about 2 years ago, but he walked late. He has pelvic and shoulder weakness but his calves appear hypertrophic. His brother, 2 maternal first cousins, and a maternal uncle all died after becoming wheel chair bound.

- What is the inheritance pattern exhibited in this pedigree?
- What is the clinical difference between Duchenne and Becker muscular dystrophy?
- Why are women only rarely affected with Duchenne's? How can the carrier status of an at risk female be determined?
- What is dystrophin?
- In the 1990s how could the clinical diagnosis of Duchenne's muscular dystrophy be confirmed most reliably?

### Task

A 35-year-old female presented with complaints of intermittent diplopia and ptosis, worse at the end of the day, for the last year. The diplopia fluctuated between horizontal, vertical and diagonal. She described her left eye as "lazy," and stated it had been getting progressively worse. Upon questioning, she complained of generalized muscle weakness, difficulty swallowing and breathing for the last three months.

1. List key signs and symptoms associated with systemic myasthenia gravis.
2. What history questions should one ask every patient suspected of having myasthenia gravis?
3. Describe the diagnostic tests for myasthenia gravis.
4. What are the classes of medication used to treat myasthenia gravis?
5. Describe the mechanism of action of the pharmaceutical agents involved in the treatment of myasthenia gravis.
6. What medications should be avoided in patients with myasthenia gravis?

### Tasks for the assessment of competence "PC – 16":

### Task

A 72 year old woman was hospitalized with speech disorder, weakness in both her arm and leg and paralysis of a gaze. The disease began suddenly when she woke up in the morning. During last week she had two attacks of transient monocular blindness, which lasted for a few seconds.

Objectively: The level of consciousness was normal, but the woman could not speak. Her face was pale, blood pressure was 180/100 mm Hg, pulse was arrhythmical. There was motor aphasia, conjugate gaze deviation to the left, right side hemiparesis and positive Babinsky's sign.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

### Task

A 45 year old man was admitted to clinic. His level of consciousness was reduced, with GCS =10. He had severe headache, vomiting and weakness in both his arm and leg. The disease has developed suddenly after emotional overstrain. Also the patient has been suffering from hypertension for a long time.

Objectively: the patient's face is red. His blood pressure is 220/120 mm Hg, and his pulse is 60 beats per minute. Neck muscles rigidity is about 3 cm, Kerning symptom is positive at an angle of 100°. The left pupil is dilated and right side hemiparesis and hemihyesthesia are observed.

- Make an preliminary diagnosis
- What examinations are necessary to verify a diagnosis?
- What emergency medical care is required for this patient?

### Task

A 35 year old man was admitted to the emergency room with confused state. The disease had an acute onset. It began suddenly with a very severe headache, after which the disturbance of consciousness and vomiting developed.

Objectively: there is delirium, neck muscles rigidity of 5 cm, Kerning's symptom. Focal neurologic symptoms are absent.

- Make an preliminary diagnosis
  - What examinations are necessary to verify a diagnosis?

### Task

How would you comment the following CSF?

- Pleocytosis is 120/mm<sup>3</sup>
- Lymphocytes are 100/ mm<sup>3</sup>
- Polymorphonuclear leukocytes are 20/ mm<sup>3</sup>
- Proteins are 1.66 g/L
- Sugar content is 20 mg/dL
- CSF is cloudy with clots.

### Task

How would you comment the following CSF?

- CSF pressure is 400 mm H<sub>2</sub>O
- The CSF is cloudy and of yellow-green color
- Cytosis is 2000/ mm<sup>3</sup> ; polymorphonuclear leukocytes (neutrophils) are prevailed
- Protein is 5,6 g/L
- Sugar content is 20 mg/dL.

### Task

A 36 year old woman was hospitalized with severe headache and weakness in both her left arm and leg. Disease has been developing gradually for 2 weeks. The woman has chronic infection in the middle ear.

Objectively: the patient is confused; body temperature is 38,9°. Left side spastic hemiparesis and papilledema are present.

Laboratory blood tests: the cell count and erythrocyte sedimentation rate are elevated.

The brain precontrast CT scan reveals an area of higher density than the surrounding edematous brain in the right frontal lobe. The contrast CT study demonstrates rim enhancing lesion with thickened capsule and hypodense central cavity.

- What is the diagnosis
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### **Task**

A 20 year old female complains of fever, chills, severe headache, nausea and vomiting. The onset of disease was acute

Objectively: level of consciousness is altered (GCS = 13). The body temperature is 39°C. There are petechiae on the skin. Fast pulse, shortness of breath and stiffness of neck muscles are present. Kernig's sign is positive.

- What is an preliminary diagnosis?
- What laboratory data are needed for the final diagnosis?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### **Task**

A 22 year old male patient has been suffering from weakness, irritability, headache, fever, vomiting and insomnia for 8 days. The last 2 days the visual acuity decreased and double vision appeared.

Objectively: body temperature is 37,8°C. Stiffness of neck muscles, positive Kernig's signs, incomplete bilateral ptosis, dilatation of both pupils and slight strabismus divergent are observed.

- What is a preliminary diagnosis
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### **Task**

**What structures of the brain and the spinal cord are not impaired by multiple sclerosis?**

- cranial nerves nuclei
- white matter of the brain in paraventricular localization
- peduncles of cerebellum
- spinal cord white matter
- corpus callosum

### **Task**

**Which of the following CSF findings is least suggestive of acute multiple sclerosis?**

- an IgG index greater than 1.7
- increased myelin basic protein
- increased protein to 200 mg/dL
- presence of oligoclonal bands
- slight to moderate monocytic pleocytosis

### **Task**

**Which of the following signs or symptoms occurring in a young person is the most suggestive of multiple sclerosis?**

- bilateral internuclear ophthalmoplegia
- gait ataxia
- Lhermitte's sign

- optic neuritis
- vertigo

### Task

**Persons migrating from a zone with high risk of multiple sclerosis (MS) to one of low risk after age 15 show a risk of developing MS that is**

- equal to that of the high-risk zone
- equal to that of the low-risk zone
- intermediate between the two zones
- lower than that of the low-risk zone
- unpredictable

### Task

**A 21-year-old right-handed female student was working in the photography lab 1 week ago, which required standing all day. After that, she experienced a cold sensation in the left foot and her entire left leg fell asleep. The feeling lasted 4 to 5 days and then slowly went away. Her right lower extremity was fine. Coughing, sneezing, and the Valsalva maneuver did not worsen her symptoms. She had a slight back pain, which she thought was due to using a poor mattress. Past history includes an episode of optic neuritis in the left eye 2 years ago. At that time, she was reportedly depressed and was sleeping constantly. One day, her left eye became blurred and her vision went out. In 1 week, her vision returned to normal.**

**Her vision now is 20/20. She has not had a repeat episode since then. She had an MRI of her brain, which was normal at that time. She drinks alcohol occasionally and does not use any illicit drugs. Her only medication is birth control pills. Examination is significant for brisk reflexes and sustained clonus at the right ankle. Babinski sign is present on the right. Testing is positive for oligoclonal bands. Which of the following is the most likely diagnosis in this case?**

- Seizure
- Transient ischemic attack
- Anaplastic astrocytoma
- Multiple sclerosis
- Parkinson's disease

**What further examination is needed?**

**What results of examination are expected?**

### Task

**A patient has brought some test results from an outside doctor with her today. One of the results indicates that oligoclonal bands were positive. What are oligoclonal bands?**

- Wave frequency changes on the EEG during sleep
- Markings about the iris
- Pathologic features of Alzheimer's disease
- Chromosomal markings found with multiple sclerosis
- Immunoglobulin patterns in the cerebrospinal fluid with multiple sclerosis

### Task

**A 19-year-old man had an episode of left optic neuritis, which resolved over several weeks. Two years later there was a month long episode of bladder dysfunction. The patient underwent many tests and was told that he had multiple sclerosis. The cerebrospinal fluid in persons with multiple sclerosis will typically exhibit which of the following?**

- Glucose content of less than 20% of the serum content
- Persistently elevated total protein content
- Persistently elevated immunoglobulin G (IgG) content
- Mononuclear cell counts of greater than 100 cells per  $\mu\text{L}$ 
  - Erythrocyte counts of greater than 10 cells per  $\mu\text{L}$

### **Task**

A 25 year old male patient has been suffering from chronic lymphadenopathy, weight loss, fever, and diarrhea for 2 months. Recently apathy, indifference, reduction of libido, poor concentration and memory impairment have developed.

Examination has revealed slight manifestation of Parkinsonism and ataxic gait.

- What preliminary diagnosis would you make?
- What further examination is needed?
- What results of examination are expected?
- What is the treatment strategy for this patient?

**Please justify all your answers, i.e. explain in details why you made exactly these, not another conclusions**

### **Task**

**A 9-year-old boy is brought to your clinic by his parents because he has begun to have episodes of eye fluttering lasting several seconds. Sometimes he loses track of his thoughts in the middle of a sentence. There was one fall off a bicycle that may have been related to one of these events. There are no other associated symptoms, and the episodes may occur up to 20 or more times per day. The boy's development and health have been normal up until this point. He did have two head injuries as a young child: the first when he fell off a tricycle onto the ground, and the second when he fell off of a playset onto his head. Both episodes resulted in a brief loss of consciousness and he did not think clearly for part of the day afterward, but had no medical intervention. Which of the following tests is most likely to confirm this patient's diagnosis?**

- Brain CT scan
- Brain MRI
- Electroencephalogram
- Lumbar puncture
- Nerve conduction study

### **Task**

**A 19-year-old right-handed man who carries the diagnosis of epilepsy is seen in the urgent care clinic. He had been healthy until about age 12, when he began to have episodes of eye fluttering lasting several seconds. Sometimes he would lose track of his thoughts in the middle of a sentence. There was one fall off of a bicycle that may have been related to one of these events. He has been treated with valproic acid. At one point he was off all medications, but the seizures returned. He is now at the end of his first semester of college and came in today because he had a witnessed generalized tonic-clonic seizure this morning. He had had only about 2 hours of sleep the night before because he was studying for a final exam. Which of the following is the most appropriate thing to tell this patient?**

- "I know that you faked this seizure to avoid taking a test."
- "Lack of sleep may have contributed to triggering this seizure."
- "You can expect to have tonic-clonic seizures on a regular basis from now on."
- "Your seizures are getting worse and there is nothing we can do about it."
- "You should take the next semester off to recover and get extensive testing."

### **Task**

**A 56-year-old man with epilepsy is brought into the emergency room. He has been having continuous generalized tonic-clonic seizures for the past 30 min. He is treated with 2 mg of intravenous lorazepam. Most physicians recommend using a high dose of intravenous benzodiazepine as part of the management of status epilepticus because it has which of the following qualities?**

- Ability to suppress seizure activity for more than 24 h after one injection
- Lack of respiratory depressant action

- Rapid onset of action after intravenous administration
- Lack of hypotensive effects
- Lack of dependence on hepatic function for its metabolism and clearance
- 

#### Task

**A 44-year-old man presents with left arm shaking. Two days ago, the patient noticed left arm paresthesias along the lateral aspect of his left arm and left fourth and fifth fingers while he was reading. He thinks he may have been leaning on his left arm at the time; the symptoms resolved after 30 seconds. This morning, he noted the same feelings, lasting a few seconds, but then his fourth and fifth fingers started shaking rhythmically, and the shaking then spread to all of his fingers, his hand, and then his arm up to his elbow. This episode lasted a total of 30 seconds. He denies any strange smells or tastes, visual changes, or weakness. Afterward, his fingers felt locked in position for a few seconds. Then he felt as if he did not have control of his hand and had difficulty donning his socks. He and his wife decided to drive to emergency room, and in the car he had trouble putting his seat belt latch into its socket. Examination and routine labs are normal. Which of the following is the most appropriate next action?**

- Discharge the patient to follow up in clinic in 2 weeks
- Obtain a brain MRI
- Obtain an electroencephalogram
- Obtain an orthopedic consult
- Order electromyography and nerve conduction studies

#### Task

**A 4-year-old boy has the onset of episodes of loss of body tone, with associated falls, as well as generalized tonic-clonic seizures. His cognitive function has been deteriorating. EEG shows 1.5- to 2-Hz spike-and-wave discharges. Which of the following is the most likely diagnosis?**

- Landau-Kleffner syndrome
- Lennox-Gastaut syndrome
- Juvenile myoclonic epilepsy
- Mitochondrial encephalomyopathy
- Febrile seizures

#### Task

**A 27-year-old man begins to experience infrequent episodes of nausea, warmth rising through his body, and an unusual odor like rotting fish. His girlfriend notices that afterward he may develop twitching of the left side of his face and an inability to speak for several minutes. Afterward the man appears dazed and cannot remember what has occurred. He has otherwise been well. Magnetic resonance imaging of his brain is most likely to show a lesion in which of the following areas?**

- Left occipital lobe
- Right frontal lobe
- Cribriform plate
- Uncus
- Left parietal lobe

#### Task

**A 29-year-old man with a history of febrile seizures as a child has developed medication refractory focal seizures with impaired awareness within the past 2 years. An MRI reveals the small volume abnormality in the left temporal lobe. Which of the following is true regarding this condition?**

- This patient may benefit from a neurosurgical procedure
- The patient will probably die within 2 years
- The seizures will most likely stop with further medication titration

- A head CT should be performed
- A cerebral angiogram may confirm the diagnosis

### Task

**A 37-year-old man develops involuntary twitching movements in his left thumb. Within 30 s, he notices that the twitching has spread to his entire left hand and that involuntary movements have developed in his left forearm and the left side of his face. He cannot recall what happened subsequently, but his wife reports that he fell down and the entire left side of his body appeared to be twitching. He appeared to be unresponsive for about 3 min and confused for another 15 min. During the episode, he bit his tongue and wet his pants. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic seizures
- Absence
- Focal seizure with impaired awareness
- Focal aware sensory seizure
- Jacksonian march

### Task

**A 17-year-old boy reports involuntary jerking movements in his arms when he awakens. This has occurred during the day after a nap as well as in the morning after a full night's sleep. Over the next few months, he developed similar jerks during the day, even when he had been awake for several hours. He did not lose consciousness with these muscle jerks, but did occasionally fall. On one occasion, jerks in his legs caused a fall that resulted in a fractured wrist. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic seizures
- Absence
- Focal aware seizure
- Epilepsia partialis continua
- Myoclonic

### Task

**A 21-year-old man reports several episodes over the previous 4 years during which he lost consciousness. He had no warning of the impending episodes, and with each episode he injured himself. Observers told him that he abruptly developed a blank stare and stopped talking. His body became stiff and he arched his back. After several seconds of this type of posturing, his arms and legs started shaking violently. During one of these episodes, he dislocated his right shoulder. He routinely bit his tongue and urinated in his pants during the episodes. Choose the seizure type that best explains the patient's complaints.**

- Generalized tonic-clonic
- Generalized absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Focal aware sensory seizure

### Task

**A 25-year-old woman was fired from her job after she misplaced papers vital for the company. She had had recurrent episodes for several years during which she performed nonsensical activities such as burying her plates in the backyard, hiding her underwear, and discarding her checkbook. She did not recall what she had done after performing these peculiar activities. She had been referred for psychotherapy, but the episodes became even more frequent after she was started on thioridazine (Mellaril). Her husband observed one episode and noted that she was unresponsive for about 5 min and confused for at least 1 h. She did not fall down or remain immobile during the episodes. As the episodes became more frequent, she noticed that**

she would develop an unpleasant taste in her mouth, reminiscent of motor oil, just before an episode. Choose the seizure type that best explains the patient's complaints.

- Generalized tonic-clonic
- Absence
- Focal seizure with impaired awareness
- Epilepsia partialis continua
- Myoclonic

#### Task

A 21-year-old cocaine-abusing man develops seizures that persist for more than 30 min before emergency medical attention is available. When examined nearly 1 h later, he is still exhibiting tonic-clonic movements and has never recovered consciousness. Choose the seizure type that best explains the patient's complaints.

- Generalized tonic-clonic
- Generalized absence
- Jacksonian march
  - Tonic-clonic status epilepticus

#### Task

A 38-year-old patient has been suffering from morning headache for a year. The headache decreases at daytime. During the last months the headache became severe and vomiting appeared. Over the last few weeks the weakness the left extremities developed.

Objectively: papilledema and left-side hemiparesis are observed.

- Make an initial diagnosis. What is the future examination.

#### Task

The patient is a 45-year-old man. Relatives noticed the changes in his behavior: inappropriate humor, impaired ability to judgments, gait abnormalities and urinary incontinence. The patient complains of constant headache and vomiting which begins each morning before he rise from bed.

Objectively: inappropriate behavior, loss of smell sense and papilledema were revealed. Gait was noticed to be without any signs of cerebellar ataxia.

- What clinical syndromes may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis ? Justify your decision

#### Task

The 48-year-old woman complains of headaches, fatigue, muscular pains, vision disturbances and amenorrhea. She notes that she is not able longer to put on rings that used to fit and that her shoe size has progressively increased.

Objectively: enlarged hands and feet, prominent supraorbital ridges, protruded mandible, separated teeth and thick lips, enlarged tongue. Bitemporal hemianopsia.

- Make an preliminary diagnosis.
- Explain the pathophysiological mechanism of bitemporal hemianopsia
- What examinations are necessary to verify a diagnosis?

#### Task

The 46-year-old woman has been suffering from progressive unilateral right side loss of hearing for two years. Tinnitus, unstable gait and systemic dizziness appeared half a year ago. Facial numbness and facial weakness developed two weeks ago.

Objectively: papilledema, nystagmus, right side deafness, facial weakness on the right side, intentional tremor and ataxic gait were observed.

- What clinical syndromes may be diagnosed in the patient?

- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### Task

A 45-year-old woman complains of pain and paresthesias in the left side of the thorax and weakness in the left leg. Pain appeared two months ago. Her doctor made a diagnosis of “osteochondrosis” and prescribed anti-inflammatory drugs and physiotherapy. However, pains were growing worse, aggravating at coughing, sneezing and movements of the trunk. The pains were unbearable when the woman was lying down. Last week weakness in her left leg appeared. Objectively: left leg weakness associated with spasticity, high tendon reflexes and positive Babinsky’s symptom was revealed. Decreased pain sensation from the right rib arc to the heel and decreased proprioceptive sensation in the left leg were also observed. Tenderness when tapped over the Th6 spinous process was present.

- What clinical syndrome may be diagnosed in the patient?
- What is the most likely topical diagnosis? Justify your answer
- What is the most likely clinical diagnosis?
- What additional examination should be carried out for the patient to formulate a clinical diagnosis? Justify your decision

### Task

The patient is a 45-year-old man. He complains of severe pain, numbness and tingling in the buttocks and legs, weakness in legs, and incontinence of bladder and bowels.

These disorders evolved slowly during last 4 months.

Objectively: asymmetric flaccid paraplegia in legs, absence of both ankle and knee jerks, loss of sensation in L4-S5 dermatomes (in lower extremities and an anogenital area) are observed.

- Make an initial diagnosis and prescribe examination and treatment.
- What are the major types of neurogenic bladder?

### Task

The patient is a 35 year old driver. He suffered from recurrent back pain for 4 years. 3 days ago he felt acute pain in the lower part of his back after lifting a heavy object. Pain irradiated to his right leg. Pain becomes worse when coughing and sneezing.

Objectively: the movements in the lumbar area are limited because of pain. Knee jerk reflexes are intact, left ankle jerk reflex is present, but the right one is absent. Reduction of muscle power of the right foot flexors is observed. Sensitivity of the lateral parts of the right foot and shin is decreased.

Make a diagnosis and prescribe the treatment for this patient.

### Task

A 25 year old man was admitted 15 minutes ago. He got a blow on his face and lost consciousness for 2-3 minutes. When he regain his consciousness he couldn’t understand what had happened. Now he complains of headache and nausea.

Objectively: pallor of the face, sweating of palms, postural tremor of fingers and instability in Romberg’s test are observed.

- Make an initial diagnosis and prescribe examination.

### Task

A 30 year old woman was hospitalized 2 hours after the accident. She was unconscious for 15 minutes after the trauma. Then she began to understand what she was asked about and became able to answer the questions, but was sleepy.

Objectively: perforation of the right tympanic septum and Bell’s palsy were revealed.

Make an initial diagnosis and prescribe examination and treatment.

**Task**

The patient is a 55 year old woman. A week ago she fell down and damaged the back of the head. After that a headache and vomiting developed. Then she felt satisfactory for three days. But the day before yesterday headache appeared again and became more severe. The woman was not able to go to work yesterday. And today she has been taken to hospital by her relatives.

The examination showed the following: low level of consciousness (CGS = 10), widening of the right pupil, bradycardia and left side hemiparesis with Babinsky's sign.

- Make a primary diagnosis and prescribe examination and treatment.

**Task**

A 32 year-old woman complains of pain in her back and left leg. Three weeks earlier, while standing on a ladder to change a light bulb, she suddenly felt a pain in her left thigh. Later, sharp shooting pain spread down along the posterior side of the left leg to a heel.

Pain was worsened by sitting and standing. Weakness and numbness were denied. There were no sphincter symptoms. There was no history of trauma.

- What nerve(s) and roots are implicated in this woman's pain?
- Where weakness might be expected? What reflex might be lost?
- What are the "danger" symptoms of back pain which would argue for MRI and possible early surgery?
- Give a few etiologies for low back pain.

**Task**

A 28 year old patient fell asleep after alcohol abuse. When he woke up, he felt weakness in his left hand.

Objectively: radial deviation of the hand, weak wrist extension, weak extension of all digits, normal sensory findings are observed.

- Make a diagnosis and prescribe the treatment.

**Task**

A 56-year-old female was hospitalized with complaints of burning pain in shins and feet. For last five years she periodically felt thirsty, suffered from hunger and fatigue.

Objectively: loss of both superficial and deep sensations of the stocking type and absence of ankle reflexes. Systolic blood pressure falls down to 30 mm Hg. when she changes her position from horizontal to vertical one.

- 4) Make a diagnosis and prescribe the treatment.

**Task**

A 6 year-old boy presents to clinic for evaluation of "he straddles when he stands and waddles when he walks". These abnormalities were first noted about 2 years ago, but he walked late. He has pelvic and shoulder weakness but his calves appear hypertrophic. His brother, 2 maternal first cousins, and a maternal uncle all died after becoming wheel chair bound.

- What is the inheritance pattern exhibited in this pedigree?
- What is the clinical difference between Duchenne and Becker muscular dystrophy?
- Why are women only rarely affected with Duchenne's? How can the carrier status of an at risk female be determined?
- What is dystrophin?
- In the 1990s how could the clinical diagnosis of Duchenne's muscular dystrophy be confirmed most reliably?

**Task**

A 35-year-old female presented with complaints of intermittent diplopia and ptosis, worse at the end of the day, for the last year. The diplopia fluctuated between horizontal, vertical and

diagonal. She described her left eye as “lazy,” and stated it had been getting progressively worse. Upon questioning, she complained of generalized muscle weakness, difficulty swallowing and breathing for the last three months.

1. List key signs and symptoms associated with systemic myasthenia gravis.
2. What history questions should one ask every patient suspected of having myasthenia gravis?
3. Describe the diagnostic tests for myasthenia gravis.
4. What are the classes of medication used to treat myasthenia gravis?
5. Describe the mechanism of action of the pharmaceutical agents involved in the treatment of myasthenia gravis.
6. What medications should be avoided in patients with myasthenia gravis?

#### 4.3. Questions for colloquiums, interviews (*specify the competence code*):

##### 4.4. Tasks (assessment tools) for the exam

The full package of examination tasks/tasks is given (*UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16*):

##### Examination tasks:

1. The patient is a 35 year old driver who has complained of periodic low back pain for 4 years. 3 days ago after lifting a heavy object he felt acute lower back pain irradiated to his right leg. Pain becomes worse when coughing and sneezing.

Objectively: the movements in the lumbar area are limited because of pain. Knee reflexes are intact, left ankle reflex is present, but the right one is absent. Reduction of muscle power of the right foot flexors is observed. Sensitivity of the lateral parts of the right foot and shin is decreased.

Make a diagnosis and administer treatment.

2. A 50 year old patient was hospitalized with complaints of shooting pains in the left part of his face. The pains lasts from several seconds to several minutes. The attacks are provoked by chewing, talking, washing and cleaning teeth. No pathology is revealed by neurological examination.

Make a diagnosis and administer the treatment.

3. A 28 year old patient fell asleep in the condition of alcoholic inebriation. When he woke up, he felt weakness in his left hand and could not unbend his left hand and fingers. Objectively there is a wrist drop and reduced finger extension.

Make the diagnosis and administer the treatment.

4. A 56 year old female was hospitalized with complaints of burning pains in her shins and feet. The pains getting worse at night. For last five years she has periodically felt thirsty, suffered from hunger, skin itching and fatigue.

Objectively: absence of both ankle jerk reflexes and hypoesthesia in the stocking distribution. Systolic blood pressure falls down to 30 mm, when she changes her position from horizontal to vertical one.

Make a diagnosis and administer treatment.

5. An 35-year-old man was admitted to the hospital. Two weeks after viral upper respiratory infection the following symptoms developed in this patient: muscle pains in hips and shins, symmetric limb weakness of distal and proximal muscles of legs and arms, weakness of facial muscles at both sides, decrease in sensitivity in stocking-and-glove distribution.

Objectively the flaccid tetraparesis, bilateral Bell’s palsy and hypoesthesia of «stocking-and-glove» type were revealed. Knee jerks and ankle reflexes were absent. Respiratory rate was 35 per minute.

Diffuse cyanosis was also present. Motor nerve conduction velocity was reduced. The protein level in the cerebrospinal fluid was elevated.

Make a diagnosis and administer the treatment.

6. A 20-year-old man has weakness in feet and atrophy of calf that have been gradually progressing for 2 years. The patient's father has weakness in his legs. Neurological examination reveals the foot drop gait, thinness of the lower legs ("stork legs"), flaccid paralysis in feet, absence of ankle reflexes, hypoaesthesia of stocking-like distribution.

Make a diagnosis and administer the treatment.

7. A 20 years old female was admitted to the hospital. The onset of disease was acute and accompanied with fever, chills, severe headache, nausea and vomiting.

Objectively: patient is prostrated. The body temperature is 39 C°. There are petechias on the skin. The pulse is rapid and the respiratory rate is increased. The stiffness of neck muscles is expressed. Kernig's signs are positive.

What is a primary diagnosis? What laboratory data are needed for verification of the diagnosis? Administer the treatment.

8. A 22 year old male patient has been suffering from weakness, irritability, headache, fever, vomiting and insomnia for 8 days. For the last two days the visual acuity decreased and double vision appeared.

Objectively: body temperature is 37,8 C°. Stiffness of neck muscles, positive Kernig's signs, incomplete bilateral ptosis, dilatation of both pupils and slight strabismus divergent are observed.

Make a primary diagnosis. What additional diagnostic methods would you administer? What results of them do you expect?

9. A 25 year old male patient has been suffering from chronic lymphadenopathy, weight loss, fever, and diarrhea for 2 months. Recently apathy, indifference, reduction of libido, retardation, poor concentration and memory loss have appeared.

Examination has revealed slight manifestation of parkinsonism and ataxic gait.

What primary diagnosis would you make?

10. How would you comment the following CSF?

.Pleocytosis is 120/mm<sup>3</sup>

.Lymphocytes are 100/ mm<sup>3</sup>

.Polymorphonuclear leukocytes are 20/ mm<sup>3</sup>

.Proteins are 1.66 g/L;

Sugar content is 20 mg/dL

11. How would you comment the following CSF?

• The CSF is cloudy and of yellow-green color

• Pressure is 400 mm H<sub>2</sub>O

• Cytosis is 2000/ mm<sup>3</sup>; polymorphonuclear leukocytes (neutrophils) prevail;

• Protein is 5,6 g/L

Sugar content is 20 mg/dL.

12. A 36 year old woman was hospitalized with severe headache and weakness in her left extremities. Disease has been developing gradually for a week. At first headaches appeared, then, during three days,– weakness of left extremities was getting worse. From her case history the woman has congenital heart disease and chronic infection of the middle ear.

Objectively: patient is prostrated, body temperature is 38,9°. Hemispasticity on left and papilledema are observed.

Laboratory peripheral blood test: the content of cell elements and erythrocyte sedimentation rate are elevated. The CT of brain shows a round hyperintensive object with a level of fluid in the centre and with capsule in the right frontal lobe.

Make a diagnosis and administer the treatment.

13. A 72 year old woman was hospitalized with speech disorder, weakness in her right extremities and paralysis of a gaze. The symptoms developed suddenly in the morning. During last week she had two attacks of transient monocular blindness, which lasted for a few seconds.

Objectively: the patient's consciousness is preserved, but production and comprehension of speech is not possible. Her face is pale, blood pressure is 180/100 mm Hg, pulse is arrhythmical. Objectively: there is motor aphasia, conjugate gaze deviation to the left, right side hemiparesis and positive Babinsky's sign.

Make a primary diagnosis and administer examination and treatment.

14. A 45 year old man was admitted to clinic. His consciousness was reduced to the state of stupor. He had severe headache, vomiting and weakness in his right extremities. The headache and developed suddenly after emotional stress. The patient has been suffering from arterial hypertension for a long time.

Objectively: the patient's face is red. His blood pressure is 220/120 mm Hg, and his pulse is 60 beats per minute. Nuchal rigidity is present., Kerning sign is positive. The left pupil is dilated (anisocoria). Right side hemiparesis and hemihyposthesia are observed.

Make an initial diagnosis. Administer the examination and urgent medical care.

15. A 35 year old man was admitted to the emergency room in the state of psychomotor agitation. The disease had an acute onset. It began suddenly with a very sharp headache. Then vomiting and psychomotor agitation developed.

Objectively: psychomotor agitation, nuchal rigidity, Kerning's sign are present. Focal neurologic symptoms are absent.

Make an initial diagnosis. Administer an examination and urgent medical care.

16. The patient is a woman of 38. She has been suffering from morning headaches for a year. The headaches became better at daytime. During the last months the headaches became severe. They began to be accompanied by vomiting. During the last week the women felt the weakness in her left extremities.

Objectively confused consciousness, papilledema and left-side hemiparesis are observed.

Make an initial diagnosis and administer the examination.

17. The patient is a man of 45. Surrounding noticed that he has gotten personality changes, abnormal lack of ability to act and to make decisions, gait abnormalities and urinary incontinence. He complained of constant headaches and vomiting in the morning

On examination confusion, decrease of judgment, loss of smell sense and papilledema were revealed. Gait was noticed to be without any signs of cerebellar ataxia.

Make a primary diagnosis. Administer examination.

18. The 48 year old woman came to the office complaining of a 4-year history of headaches, fatigue, vision disturbances and amenorrhea. Patient noticed excessive skeletal and soft tissue growth for the past 4 years. Facial features, hands and feet became larger.

Objective bulbous nose, prominent supraorbital ridges, protruded mandible, separated teeth and thick lips are present. Bitemporal hemianopsia and optic discs pallor are revealed.

Make a primary diagnosis and administer the following examination.

19. The 46 year old female patient has been suffering from progressive unilateral right side loss of hearing for two years. Tinnitus, unstable gait and systemic dizziness appeared half a year

ago. Two weeks ago the woman felt facial numbness and facial weakness. The feeling of taste at the right side of tongue decreased

Objectively papilledema, nystagmus, right side facial weakness and loss of sensation in the region innervated by the right trigeminal nerve, right ear deafness, cerebellar gait ataxia and right side intentional tremor were observed

Make a primary diagnosis and administer examination

20. The patient is a 45 year old woman. One month ago local pain and parasthesias appeared in her left shoulder blade. The pain began to grow with time, aggravating at coughing, sneezing and turning of the trunk. The pains were unbearable when the woman was lying down. Last week weakness in her left leg developed.

Objectively: left leg weakness and spasticity, increased tendon reflexes and positive Babinsky's symptom were revealed. Decreased pain and temperature sensation right side below ribs and absence of deep sensation in the left leg were also observed. Percussion over the Th6 spinous process elicited tenderness.

Name the syndrome. Make a primary diagnosis and administer examination.

21. The patient is a 45 year old man. A month ago pain in his back, the rectal area and both legs appeared. The pain had been growing gradually until it became unbearable despite of intake of analgesics. Two weeks ago disturbance of urination and weakness of the legs, especially of the feet, appeared as well.

Objectively: flaccid paraplegia of feet, absence of ankle reflexes, hypoesthesia in the anogenital area were noted. Lasegue's sign (straight leg raise test) was positive on both sides.

Make a preliminary diagnosis and administer examination.

22. A 25 year old man was admitted some hours ago. He got a blow on his face and lost consciousness for some minutes. When he regain his consciousness he was confused for some minutes and couldn't understand what had happened. Then he was vomiting for two hours.

Objectively: pallor of the face, tremor of stretched fingers, slight staggering in Romberg posture and high tendon reflexes were noted.

Make a preliminary diagnosis and administer examination and treatment.

23. A 30 year old woman was hospitalized 2 hours later after the accident. She was unconscious for 15 minutes after the trauma. She understood what she was asked about, answered the questions, but got exhausted and was sleepy.

On examination perforation of the right tympanic septum and right side Bell's palsy were noted.

Make a preliminary diagnosis and administer examination.

24. The patient is a 55 year old woman. A week ago she fell down and hurt her occipit. Headaches and vomiting were transient and disappeared for three following days, but after that reappeared and became stronger. The patient was brought to the hospital by her relatives.

The examination showed the following: obtundation; anisocoria with right pupil larger than left; bradycardia; left side hemiparesis with Babinsky's sign.

Make a preliminary diagnosis. Administer the examination.

25. Two hours prior to admission to the emergency ward a 52 year- old man developed right arm, hand and leg weakness. At the time of examination, dysphasia and right face drooping were noted. Over the ensuing hour the patient became obtunded, areflexic on the right side, and completely unable to lift the right arm against gravity. The physical exam added no new information.

What syndrome is revealed in the patient?

What structures are involved?

Where is the focus of the lesion?

26. A 45 year old man was admitted to clinic. He had severe headache, vomiting and weakness in his right extremities. The disease developed suddenly after acute emotional stress. Also the patient has been suffering from hypertension for a long time.

Objectively: blood pressure is 220/120 mm Hg, pulse is 60 beats per minute. Skin of the face is red and moist. Obtundation, nuchal rigidity (neck stiffness), positive Kerning sign, anisocoria with dilated left pupil, as well as right side hemiparesis are observed.

Make an initial diagnosis, administer examination and urgent treatment.

27. A 65 year-old man complained of weakness in the right arm. For 3 months he had been dropping objects, and it was gradually getting worse. There were no sensory symptoms. On exam, the patient was mildly confused and speech was slow and slurred. The right nasolabial fold was flat. Muscle bulk was normal. No fasciculations were seen. Rapid passive movements of the right arm or leg met with resistance which would give way ("clasp-knife"). Strength was minimally diminished in the right intrinsic hand muscles, the wrist dorsiflexors, triceps, deltoids, iliopsoas, hamstrings and tibialis anterior. A right pronator drift was observed. Finger movements were slow on the right. The right leg circumducted while walking. Reflexes were hyperactive on the right. The right plantar response was extensor. Sensation to touch, pin, cool, vibration was normal. Two-point discrimination, point localization and graphesthesia were poorly done on the right in comparison with the left.

What is possible site of a lesion in this case?

List features of the clinical upper motoneuron syndrome.

Give a few etiological possibilities.

28. A 35 year old man was admitted to the emergency room in the state of psychomotor agitation. The disease had an acute onset. It began suddenly with a sharp headache. Then vomiting and psychomotor agitation developed.

Objectively: psychomotor agitation, nuchal rigidity, Kerning's sign are present. Focal neurologic symptoms are absent.

Make an initial diagnosis. Administer an examination and urgent medical care.

29. A 67 year old patient complains of headache and weakness in the left arm. Testing shows pronator drift (upper Barre sign) on the left side. Tendon reflexes in the left biceps and triceps muscles are higher than on the right. A positive Babinski sign on the left is observed.

Name the syndrome. Make a topical diagnosis.

30. A 36 year old woman was hospitalized with severe headache and weakness in left extremities. Disease has been developing gradually for a week. Symptoms gradually increase. Previous history: recurrent right middle ear infections.

Objectively: obtundation, fever, left side hemiparesis and papilledema are observed. In peripheral blood test the content of cell elements and erythrocyte sedimentation rate are elevated. The CT of brain shows a round intra-axial lesion in the right frontal lobe. Post contrast shows a thin and smooth wall.

Make a diagnosis and administer treatment.

31. A 10 year old female patient complains of attacks of abnormal jerking of her left hand and fingers lasting for 2-3 minute without loss of consciousness. For the last 4 weeks the attacks have become more frequent and began to involve half of the face

Name the syndrome. Make a topical diagnosis.

32. A 20 years old female was hospitalized for fever, chills, severe headache, nausea and vomiting. The onset of disease was acute

Objectively: A level of consciousness is decreased. The body temperature is 39°C. There are petechias on the skin. The pulse is rapid and the respiratory rate is increased. The stiffness of neck muscles is expressed. Kernig's sign is positive.

What is your opinion about a preliminary diagnosis? What additional tests are needed for the final diagnosis? Administer the treatment.

33. A 38 year old patient complains of weakness in his left hand. The symptoms developed gradually over past few months. Pain in the neck followed by neurological problems. His family history was positive for breast cancer (sister) and prostate cancer (father). A neurological examination revealed fasciculations, hypesthesia in C6 – C8 dermatomes, mild weakness in the C6 – C8 spinal nerves distributions and mild hyporeflexia in the left upper extremity.

Name the syndrome. Make a topical diagnosis.

34. A 35 year old man was admitted to the emergency room with confusion, psychomotor agitation and vomiting. The disease had an acute onset. It began suddenly with acute severe headache. Then confusion, psychomotor agitation and vomiting developed.

Objectively: psychomotor agitation, nuchal rigidity, Kerning's sign are present. Focal neurologic symptoms are absent.

Make a preliminary diagnosis and administer examination.

35. A 50 year old patient was hospitalized with complaints of shooting pains in the left part of his face. The pains last from several seconds to several minutes. The attacks are provoked by chewing, talking, washing, cleaning teeth. On neurological examination no pathology was revealed.

Make a preliminary diagnosis. Discuss medical examination and treatment.

36. An 83-year-old right-handed woman was eating dinner when she suddenly slumped to the right and her speech became slurred and nonfluent. Past medical history is significant for hypertension, hyperlipidemia, type 2 diabetes mellitus.

On physical examination, the patient's blood pressure is 150/95 mm Hg. She is conscious, but is unable to properly form complete and articulate sentences and has trouble speaking fluently. Her comprehension is relatively preserved. Mild right arm and leg weakness is present.

Make a preliminary diagnosis. Discuss medical examination and emergency treatment.

37. While riding her bike, the 28-year-old female cyclist was hit by a motorcycle. She flew over her handlebars and landed on her head. Her symptoms included transient dizziness, ringing in the ears, headaches, fatigue, nausea, difficulty concentrating, and loss of balance which lasted for 2 hours

On physical examination, bilateral postural tremor in the hands and fingers is noticed. The patient shows instability in Romberg test even with her eyes open.

Make a preliminary diagnosis and assign medical examination. Discuss emergency treatment.

38. The 35-year-old male awoke with a “pins-and-needles” sensation and accompanying numbness in his hands and feet. Upon arising, he became aware of mild weakness of his lower extremities. The weakness progressed to involve his upper extremities, and he was hospitalized 3 days later.

On physical examination, flaccid tetraparesis, Bell's palsy, hypoesthesia of «stocking-and-glove» type, absence of knee and ankle reflexes are observed. Respiratory rate is 35 per minute. Nerve conduction velocities are reduced. The protein level in the cerebrospinal fluid is elevated.

Make a diagnosis and administer urgent treatment.

## **5. The content of the assessment tools of mid-term assessment**

Mid-term assessment is carried out in the form of an exam.

*Final test in topical neurology: <https://sdo.pimunn.net/mod/quiz/view.php?id=120110>*

*Final test in clinical neurology: <https://sdo.pimunn.net/mod/quiz/view.php?id=120111>*

5.1 The list of control tasks and other materials necessary for the assessment of knowledge, skills and work experience (*the teacher indicates only those tasks and other materials that are used within the framework of this discipline*)

5.1.1. Questions for the discipline exam \_\_\_\_\_ (*if an exam is provided*)

Question	Competence code (according to the WPD)
Voluntary motor control. Pyramidal pathways. Upper motor neuron syndrome	GPC-9, PC – 5, PC - 6
Upper motoneuron paralysis. Symptoms and signs	GPC-9, PC – 5, PC - 6
Signs of lower motoneuron paralysis	GPC-9, PC – 5, PC - 6
Syndromes caused by lesions of the capsula interna and thalamus	GPC-9, PC – 5, PC - 6
The signs of transection of the spinal cord at the C1-C4 levels	GPC-9, PC – 5, PC - 6
The signs of transection of the spinal cord at the C5-Th1 levels	GPC-9, PC – 5, PC - 6
The signs of transection of the spinal cord at the C5-Th1 levels	GPC-9, PC – 5, PC - 6
The signs of transection of the spinal cord at Th2-Th12 levels	GPC-9, PC – 5, PC - 6
The signs of transection of the spinal cord at L1-S2 levels	GPC-9, PC – 5, PC - 6
The signs of transection of a spinal cord at the S3-S5 levels	GPC-9, PC – 5, PC - 6
Conus medullaris syndrome	GPC-9, PC – 5, PC - 6
The signs of cauda equina compression	GPC-9, PC – 5, PC - 6
Brown - Sequard Syndrome	GPC-9, PC – 5, PC - 6
The upper and lower limbs motor neurological examination. Examination of tendon and skin reflexes.	GPC-9, PC – 5, PC - 6
Extrapyramidal system. The structures and functions. Primary and secondary Parkinson's syndrome.	GPC-9, PC – 5, PC - 6
Extrapyramidal system. The structures and functions. Hyperkinesias.	GPC-9, PC – 5, PC - 6

Primary and secondary parkinsonism. Etiology. Primary parkinsonism (Parkinson's disease)	GPC-9, PC – 5, PC - 6
Wilson disease. Symptoms and signs. Diagnosis, differential diagnosis. Treatment.	GPC-9, PC – 5, PC - 6
Cerebellum. Signs of the lesion	GPC-9, PC – 5, PC - 6
Trigeminal neuralgia.	GPC-9, PC – 5, PC - 6
Examination of coordination. Types of ataxias (cerebellar, sensitive, vestibular)	GPC-9, PC – 5, PC - 6
Gait disorders. The gait in hemiparesis, upper motor neuron paraparesis, parkinsonism, cerebellar ataxia, sensory ataxia, chorea, muscular dystrophy, lower motor neuron paraparesis.	GPC-9, PC – 5, PC - 6
Sensation. Pathways	GPC-9, PC – 5, PC - 6
Cranial nerves 1 and 2. Clinical examination.	GPC-9, PC – 5, PC - 6
Cranial nerves 3, 4, 6. Clinical examination	GPC-9, PC – 5, PC - 6
Clinical examination of the 5th cranial nerve	GPC-9, PC – 5, PC - 6
Cranial nerve 7. Clinical examination	GPC-9, PC – 5, PC - 6
Facial nerve neuropathy. Bell's palsy symptoms. Diagnostic. Treatment	GPC-9, PC – 5, PC - 6
Cranial nerve 8. Clinical examination	GPC-9, PC – 5, PC - 6
Cranial nerves 9, 10, 11, 12. Clinical examination	GPC-9, PC – 5, PC - 6
Bulbar and pseudobulbar paralysis. Symptoms and signs.	GPC-9, PC – 5, PC - 6
Horner's syndrome	GPC-9, PC – 5, PC - 6
Agnosia. Apraxia. Aphasia Classification. Clinical signs. Diagnosis, differential diagnosis	GPC-9, PC – 5, PC - 6
The brain's frontal lobe. Syndromes of lesions	GPC-9, PC – 5, PC - 6

Occipital lobe lesions. Clinical signs	GPC-9, PC – 5, PC - 6
Parietal lobe lesions. Clinical signs	GPC-9, PC – 5, PC - 6
Temporal lobe lesions. Clinical signs	GPC-9, PC – 5, PC - 6
Computer tomography. Indications and contraindications in neurology. Magnetic resonance imaging. Indications and contraindications. Angiography.	GPC-9, PC – 5, PC - 6
Lumbar puncture. Indications, contraindications. Cerebrospinal fluid examination	GPC-9, PC – 5, PC - 6
Blood supply of the brain (circle of Willis). Occlusion of the middle cerebral artery. Clinical signs	GPC-9, PC – 5, PC - 6
Blood supply of the brain (circle of Willis). The vertebral-basilar system. Signs of posterior circulation transient ischemic attacks and strokes. Signs of occlusion of arteria cerebri posterior	GPC-9, PC – 5, PC - 6
Carotid arterial system. Total and partial anterior circulation infarcts. Symptoms and signs. Diagnostic. Emergency treatment	GPC-9, PC – 5, PC - 6
Transient ischemic attack. Definition. Anterior circulation TIAs and posterior circulation TIAs symptoms. Diagnosis	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Ischemic stroke. Anterior circulation and posterior circulation infarcts. Symptoms, diagnosis. Treatment.	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Primary and secondary prevention of ischemic stroke and TIA	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Cerebral haemorrhage. Etiology. Symptoms and signs. Diagnostic test. Urgent medical care and treatment	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Subarachnoid haemorrhage. Etiology, symptoms and signs. Diagnostic test. Urgent medical care and treatment	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Signs of meningeal irritation. Clinical examination	UC-4, GPC-8, GPC-9, PC – 1, PC –

	5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Viral meningitis. Etiology. Symptoms and signs. Diagnosis. Differential diagnosis. Treatment	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Bacterial meningitis. Classification. Symptoms and signs. Cerebrospinal fluid examination. Diagnosis. Differential diagnosis. Treatment	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Changes of the cerebrospinal fluid in meningitis (bacterial, viral, tuberculosis meningitis)	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Tuberculosis meningitis. Symptoms and signs. Cerebrospinal fluid examination. Diagnosis. Treatment.	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Viral encephalitis. Classifications. Herpes simplex encephalitis. Symptoms and signs. Diagnosis. Treatment	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Arbovirus encephalitis. Types of arbovirus encephalitis. Symptoms and signs. Diagnosis. Treatment	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Rhabdovirus encephalitis. Symptoms and signs. Diagnosis. Treatment	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Brain abscess. Etiology. Symptoms and signs. Diagnosis. Treatment.	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Multiple sclerosis. Symptoms and signs. Diagnosis. Differential diagnosis. Treatment	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Multiple sclerosis. Symptoms and signs. Types of course. Diagnosis, differential diagnosis. Treatment.	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
AIDS. Neurological manifestations of AIDS	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Epilepsy. Classification of seizures.	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Epilepsy. Classification of epilepsy. Epilepsy treatment	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Headaches. Classification. A tension-type headache. Symptoms. Diagnosis. Treatment	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Migraine. Clinical subtypes. Symptoms. Diagnosis and	UC-4, GPC-8, GPC-9, PC – 1, PC –

differential diagnosis. Treatment of migraine attacks. Preventive treatment	5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Migraine. Clinical subtypes. Pathogenesis, Symptoms. Treatment.	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Status epilepticus. Treatment	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Syncope. Classification. Symptoms and signs. Diagnosis. Differential diagnosis. Treatment.	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Brain tumor. General symptoms and signs. Diagnosis. Differential diagnosis	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Supratentorial tumors of the brain. Clinical signs. Diagnosis	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Subtentorial tumors of the brain. Clinical signs. Diagnosis	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Tumors of the pituitary gland. Classification. Symptoms and signs. Diagnosis	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Dislocation syndrome. Transtentorial and tonsillar herniation, (downward cerebellar herniation)	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Spinal tumors. Classification. Extra- and intradural spinal tumors. Symptoms and signs.	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Traumatic head injury. Classification. Cerebral concussion. Contusion. Diffuse axonal injury	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Traumatic brain injury. Assessment and early management	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Traumatic spinal injury. Classification. Symptoms and signs. Diagnosis. First aid and emergency treatment	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Head injury. Subdural hematoma. Epidural hematoma. Symptoms and signs. Diagnostic. Treatment.	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Spinal injury. Classification. Diagnosis. First aid. Treatment, rehabilitation	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Ulnar nerve injury. Symptoms and signs. Diagnosis	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11,

	PC – 14, PC - 16
Median nerve injury. Symptoms and signs. Carpal tunnel syndrome. Diagnosis. Treatment.	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Radial nerve injury. Symptoms and signs. Diagnosis. Treatment	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Injury of brachial plexus. Symptoms and signs	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Femoral nerve. Signs of the lesion	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Lumbar and sacral radiculopathy. Symptoms and signs. Diagnosis	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
S1 radiculopathy. Symptoms and signs. Diagnostics. Treatment.	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Damage to the common peroneal nerve. Symptoms and signs	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Progressive muscular dystrophies. Classification. Symptoms and signs. Diagnosis, differential diagnosis. Treatment.	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Coma. Assessment of consciousness level in emergency medicine. Glasgow coma scale.	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Myasthenic crisis. Classification. Symptoms and signs. Urgent care.	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16
Myasthenia Gravis. Pathogenesis. Symptoms and signs. Diagnosis, differential diagnosis. Treatment.	UC-4, GPC-8, GPC-9, PC – 1, PC – 5, PC – 6, PC – 8, PC – 10, PC – 11, PC – 14, PC - 16

## 6. Criteria for evaluating learning outcomes

Learning outcomes	Assessment of competence developed			
	unsatisfactory	satisfactory	good	excellent
<b>Completeness of knowledge</b>	The level of knowledge is below the minimum requirements. There were bad mistakes	The minimum acceptable level of knowledge. A lot of light mistakes were made	The level of knowledge in the volume corresponding to the training program. A few light	The level of knowledge in the volume corresponding to the training program, without errors

Learning outcomes	Assessment of competence developed			
	unsatisfactory	satisfactory	good	excellent
			mistakes were made	
<b>Availability of skills</b>	Basic skills are not demonstrated when solving standard tasks. There were bad mistakes	Basic skills are demonstrated. Typical problems with light mistakes have been solved. All tasks have been completed, but not in full.	All basic skills are demonstrated. All the main tasks have been solved with light mistakes. All tasks have been completed, in full, but some of them with shortcomings	All the basic skills were demonstrated, all the main tasks were solved with some minor shortcomings, all the tasks were completed in full
<b>Availability of skills (possession of experience)</b>	Basic skills are not demonstrated when solving standard tasks. There were bad mistakes	There is a minimal set of skills for solving standard tasks with some shortcomings	Basic skills in solving standard tasks with some shortcomings are demonstrated	Skills in solving non-standard tasks without mistakes and shortcomings are demonstrated
<b>Characteristics of competence formation*</b>	The competence is not fully formed. The available knowledge and skills are not enough to solve professional tasks. Repeated training is required	The formation of competence meets the minimum requirements. The available knowledge and abilities are generally sufficient to solve professional tasks, but additional practice is required for most practical tasks	The formation of competence generally meets the requirements, but there are shortcomings. The available knowledge, skills and motivation are generally sufficient to solve professional tasks, but additional practice is required for some professional tasks	The formation of competence fully meets the requirements. The available knowledge, skills and motivation are fully sufficient to solve complex professional tasks
<b>The level of competence formation*</b>	Low	Below average	Intermediate	High

*For testing:*

Mark "5" (Excellent) - points (100-90%)

Mark "4" (Good) - points (89-80%)

Mark "3" (Satisfactory) - points (79-70%)

*Less than 70% – Unsatisfactory – Mark "2"*

Developer(s):

Grigorieva V.N., MD, Professor, Head of the Department of Nervous Diseases

Zorkova A.V., Assistant of the Department of Nervous Diseases

Date " \_\_\_\_\_ " \_\_\_\_\_ 202\_\_