医学部医学科英語入試問題

下記の注意事項をよく読んで解答してください。

◎注意事項

- 1. 配付された問題冊子および解答用マークシート (受験番号のマークの仕方) に、それぞれ受験番号(4桁)ならびに氏名を記入 し、解答用マークシートの受験番号欄に自分の番 号を正しくマークしてください。
- 2. マークには必ずHBの鉛筆を使用し、濃く正しく マークしてください。

記入マーク例:良い例

悪い例 Ø ① ② ①

- 3. マークを訂正する場合は、消しゴムで完全に消し てください。
- 4. 所定の記入欄以外には何も記入しないでくださ
- 5. 解答用マークシートを折り曲げたり、汚したりし ないでください。
- 6、「止め」の合図があったら、問題冊子の上に解答用 マークシートを重ねて置いてください。

受	験	番	号
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6 6	(d) (d) (d)	(5) (6)	⑤ ⑥
9 9	6 7 8 9	6 7 8 9	© 7 @ @

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受験番号		氏	名	
	1	3		

1

Tetanus is a rare but often fatal disease that affects the central nervous system by causing painful and often violent muscular contractions. Tetanus is a noncommunicable disease, meaning that it cannot be passed directly from one person to another.

Tetanus causes convulsive muscle spasms and rigidity that can lead to respiratory paralysis and death. Sometimes tetanus is localized, that is, it affects only the part of the body where the infection began. However, in almost all reported cases, tetanus spreads to the entire body. The incubation period from the time of the injury until the first symptoms appear ranges from five days to three weeks. Symptoms usually occur within eight to 12 days. The chance of death is increased when symptoms occur early. In general, the shorter the incubation period, the more severe the disease.

Tetanus is caused by a bacterium called *Clostridium tetani*, whose spores (the dormant form) are found in soil, street dust, and animal feces. The bacteria enter the body through cuts and abrasions but will multiply only in an environment that is anaerobic, or oxygen-free. Deep puncture wounds and wounds with a lot of dead tissue provide an oxygen-free environment for the bacteria to grow.

As C. tetani grows, it excretes a highly poisonous toxin called tetanospasmin into the bloodstream, spreading it throughout the nervous system. The infection is usually transmitted through deep puncture wounds or through cuts or scratches that are not cleaned well. Many people associate tetanus with rusty nails and other dirty objects, but any wound can be a source. Less common ways of getting tetanus are animal scratches and bites; surgical wounds; dental work; punctures caused by glass, thorns, needles, and splinters; and therapeutic abortion. Rare cases have been reported in people with no known wound or medical condition.

Neonatal tetanus in newborns can be caused by cutting the umbilical cord with an unsterile (5) instrument or by improper care of the umbilical stump. Neonatal tetanus is less common in developed countries.

Tetanus toxin affects the nerve endings, causing a continuous stimulation of the muscles. Initial symptoms may include restlessness, irritability, a stiff neck, and difficulty swallowing. In about half of all cases, the first symptom is a stiff or 'locked' jaw, which prevents patients from opening their mouths or swallowing. This symptom is also called *trismus* and results in a facial expression called *risus sardonicus*, which is a Latin phrase meaning "sardonic smile." Trismus is often followed by stiffness of the neck and other muscles throughout the body as well as uncontrollable spasms. Sometimes these convulsions, known as *opisthotonos*, are severe enough to cause broken bones. Other symptoms of tetanus include loss of appetite and drooling. People with localized tetanus experience pain and tingling only at the wound site and spasms in nearby muscles.

Tetanus is diagnosed by the clinical symptoms and a medical history that shows no tetanus immunization. Early diagnosis and treatment is crucial for recovery.

Tetanus is a life-threatening disease. Patients diagnosed with it are usually hospitalized in an intensive care ward. Treatment can take several weeks and includes antibiotics to kill the bacteria and shots of antitoxin to neutralize the toxin. It also includes antianxiety drugs to control muscle spasms or barbiturates for sedation. In severe cases, patients are placed on an artificial respirator. Recovery can take six weeks or more. After recovery, since the levels of circulating toxin are quite low, the patient must still be adequately immunized against this disease.

Full recovery is common in patients who can be kept alive during the most violent portion of the attacks. Yet up to 30% of tetanus victims in the United States die. Early diagnosis and treatment improves the prognosis. Neonatal tetanus, however, has a mortality rate of more than 90%. Tetanus is easily preventable through vaccination.

- 1. The word "rigidity" is closest in meaning to
 - a, twitching
 - b. leniency
 - c. stiffness
- d. flexibility
- 2. Which of the following choices is closest in meaning to the underlined part?
 - a. Tetanus bacteria can only enter a wound if they are able to reproduce in a location that has no oxygen.
 - b. Cuts on the body will create an environment without oxygen where the tetanus bacteria can enter and multiply freely.
 - c. Oxygen can get into the body through cuts or abrasions, which will provide an environment for the tetanus bacteria to multiply.
- d. Tetanus bacteria need to be in a place without oxygen to reproduce, but they can enter the body through any wound.
- 3. The word "excretes" is closest in meaning to
 - a. expels
- b. increases
- c. restricts
- d. reforms

c. a	accompany
d. c	combine
5. The	e word "unsterile" is closest in meaning to
a. p	oor quality
b. u	nsuccessful
c. d	irty
d. q	ualified
6 The	
	word "neutralize" is closest in meaning to
	Duntéract
b. cu	
	et rid of
d. re	STREE
7: Whic	ch of the following choices is closest in meaning to the underlined part?
	the patient can recover from the disease, only a tiny amount of toxin remains circulating in
the b	body, which provides immunity from further infections.
	ter recovering from the disease, the patient can be given adequate immunity to the disease
by al	lowing small amounts of toxin to circulate in the patient's system.
c. Im	munity to the disease will help the patient recover by ensuring that the levels of toxin
circul	lating in the patient are kept low.
d. Eve	en if the patient recovers, natural immunity does not occur because the amount of toxin
circul	lating in the patient is insufficient.
8 Than	road 4
a. kno	word "prognosis" is closest in meaning to
b. dist	
c. pre	
d. trea	
α. trea	titient

4. The word "associate" is closest in meaning to

a. contactb. equate

- 9. According to the text, tetanus can affect
 - a. the face and jaw.
 - b. the neck.
 - c. the place of infection.
- d. all of the above.
- 10. According to the text, tetanus causes death by
 - a. locking the patient's jaw.
 - b. breaking the patient's bones.
 - c. stopping the patient's breathing.
 - d. poisoning the patient's blood.
- 11. According to the text, which of the following statements is not correct?
 - a. The patient's chance of surviving tetanus is greater if the symptoms appear later.
 - b. Around 50% of cases of tetanus result in a 'locked' jaw.
 - c. The tetanus toxin attacks the patient's nervous system.
 - d. Only wounds caused by rusty nails, dirty objects, or animal scratches can cause tetanus.
- 12. According to the text, which of the following statements is correct?
 - a. The tetanus bacteria are not commonly found in developed countries.
 - b. The tetanus bacteria do not always need a visible wound to enter the body.
 - c. The tetanus bacteria can only go into a wound that is dirty.
 - d. The tetanus bacteria require a deep wound to enter the body.
- 13. According to the text, the tetanus toxin affects the patient by
 - a. producing constant contraction of the muscles.
 - b. causing extreme thirst.
 - c. increasing the patient's heart rate.
 - d. triggering a response from the patient's immune system.
- 14. According to the text, the early symptoms of tetanus include
 - a. convulsions, pain, facial paralysis, and trouble swallowing.
 - b. irritability, a locked jaw, trouble swallowing, and a stiff neck.
 - c. drooling, a stiff neck, drowsiness, and convulsions.
 - d. a 'locked' jaw, spasms, drooling, and increased appetite.

- 15. According to the text, treatment for tetanus
 - a. is most effective if the patient can be diagnosed and treated quickly.
 - b. is usually effective once the patient survives the first phase of the disease.
 - c. includes treatment for the patient's anxiety.
 - d. is only successful in 30% of cases.

An enzyme that ____ foreign red blood cells invisible to the immune system could hold the key to making blood type irrelevant in transfusions.

You have a one-in-three chance of needing a blood transfusion at some point in your life. But not all blood types mix and transfusing the wrong blood type into a patient can trigger a potentially immune response. Now, researchers in Canada are closing in on a way to make universal blood that could be transfused into anyone. The technique uses enzymes to snip away the molecular flags on red blood cells by which your immune system recognizes them as foreign. Biochemist Stephen Withers and his team at the University of British Columbia published their findings in the Journal of the American Chemical Society and they have been received with interest. "It's a remarkable feat to engineer an enzyme with such efficiency and selectivity," says Henrik Clausen, enzymologist at the University of Copenhagen.

Red blood cells aren't the smooth discs often ______ in textbooks. Their surfaces bristle with sugar and protein chains. In the early 1900s, Austrian physicist Karl Landsteiner discovered blood comes in four different types — A, B, AB and O. Each type corresponds to _____ sugar chain antigens on a red blood cell's surface. These antigens are responsible for triggering the immune response. Inject an A-type person with B-type blood, for example, and antibodies in their bloodstream would recognize the transfused cells as foreign, kick-starting an immune cascade that causes the blood to clot.

The exception is O-type blood. These cells carry a shortened version of the A- and B-antigen that does not ______ the immune system and so can be given to almost anyone. But this also means it is most in demand and so is generally in short supply. So a universal donor blood would do much to alleviate supply problems, and the Withers team appears to have made a significant stride towards the goal.

Since the 1980s, researchers have tried to develop enzymes that remove antigens from the cells, but have made little headway. Part of the problem is that A- and B-type antigens come in several different sub-types, some of which can be altered more easily than others.

To solve the problem, Withers turned to an unusual source—an enzyme from the bacterium responsible for pneumococcal disease, Streptococcus pneumoniae. The enzyme, called EABase, naturally chops up sugar chains while the bacteria digest food. In the lab, it to chop the Bantigens off red blood cells, but only one of the four A-antigen chain types. So Withers increased the enzyme's activity using test tube 'evolution'. The team made random mutations to the enzyme's

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antigen-snipping machinery then tested its performance. After each round of mutation they would identify the best enzyme then mutate it once again, gradually improving its performance.

After five rounds of this, and having tested more than 3,000 mutants, they came across an enzyme that was 170 times more efficient at sugar snipping than the ______. The star enzyme, called Sp3GH98, could also chop the elusive type-2 antigen, which makes up 80% of the blood group A population. Withers says he was "not really surprised as we had seen large increases with other enzymes. But we were certainly pleased".

Withers is optimistic that once the enzyme is only a milligram per bag of blood would be needed to convert all red blood cells to the ABO-antigen-free form. One option could be to coat the inside of blood bags with it.

But before that, it needs to be tested. After snipping off the sugar, the enzyme leaves a stump that's similar — but not identical — to that found in the currently universal O-type blood. And it's not clear whether the body will develop an immune response to this new 'universal' blood type.

Withers says he does not anticipate an immune response, but Clausen, a veteran of similar research, is not so sure. He believes that the exposed sugar stumps could still potentially trigger an adverse reaction and that the blood may require further processing. Nevertheless, there are other enzymes that should be able to cap the chopped stump and render red blood cells invisible he says, "Anything is possible."

- 1. Which word is best for blank 1?
 - a. renders
 - b. leaves
- c. describes
- d. represents
- 2. Which word is best for blank 2?
 - a. noxious
 - b. sinister
 - c. morbid
 - d. fatal

a particular				
b. resourceful		•		
c. unique				
d. renewable				
5. Which word is best for blank 5?				
a. imitate				
b. propose				
c.: alert				
d. concentrate				
6. Which word is best for blank 6?				
a: intended				
b. controlled				
${f c}$. directed				
d. managed				
7. Which word is best for blank 7?				
a original				
b. model				
c. reproduction				
d. individual				
8. Which word is best for blank 8?				
a. minimized			,	
b. reordered				
c. prioritized				
d. optimized				
	— 8 —			

3. Which word is best for blank 3?

4. Which word is best for blank 4?

a. related

c. typified

b. designated

d. represented

- 9. According to the text, biochemists at the University of British Columbia are trying to
 - a. use enzymes on blood cells to stimulate the immune system.
 - b. create blood that can be transfused into any patient.
 - c. increase the supply of O-type blood.
 - d. make sure that no one is given the wrong blood type.
- 10. According to the text, what happens when someone is injected with the wrong type of blood?
 - a. The sugar chains on the blood cells' surfaces stick together and cause clotting,
 - b. The blood cells release antibodies that cause a response from the body's immune system.
 - c. The body's immune system identifies the blood cells' antigens as foreign, which causes the body to attack those blood cells and form clots.
 - d. The body will try to remove the sugar chain antigens from the surface of blood cells, which causes the immune system to think the injected blood is a foreign invader.
- 11. According to the text, researchers are hoping to create a 'universal' blood type by
 - a. removing the sugar chain antigens from blood cells.
 - b. mixing blood cells with the Streptococcus pneumoniae bacteria.
 - c. chopping the EABase enzyme off of the blood cells' surfaces.
 - d. mutating the blood cells in test tubes until they all became identical to O-type blood,
- 12. According to the text, what was the main problem facing those who wanted to create a 'universal' blood type?
 - a. The antigens on blood cells are protected by bacteria enzymes.
 - b. Some blood cells have shortened antigens.
 - c. The blood cells have too many sub-types.
 - d. Some sub-types of blood cell antigens are difficult to chop off.
- 13. According to the text, how did the scientists finally find a way to modify the blood cells?
 - a. They produced new blood cells by adding bacteria enzymes that had no antigens.
 - b. They produced many natural variations of the EABase enzyme until they found one that could remove antigens from most blood cells.
 - They randomly increased the bacteria-fighting capabilities of the A-antigens.
 - d. They searched through over 3,000 variations of A-type red blood cells until they found ones that could lose their type-2 antigen 80% of the time.

- 14. According to the text, why are the scientists unsure if the new, modified blood can be used without triggering the immune system?
 - a. The new antigen-free blood is still very difficult to convert.
 - b. They still need to find an enzyme that is more efficient than the one that they started with.
 - c . The main enzyme they are using is only effective for 80% of A-type blood cells.
 - d. The chopped-off antigens do not look exactly the same as the ones on O-type blood.
- 15. According to the text, how could an immune response from the new 'universal' blood possibly be prevented?
 - a. Their shortened sugar stumps could be exposed the same way as O-type blood.
 - b. Another enzyme could be added to the blood's shortened antigen to help it imitate O-type blood.
 - c. They could add sugar chains to the stumps to make them invisible.
 - d. They have not yet found a solution to the problem of immune response.

3 次の英文を読み,1.~10.の下線部に入る最も適する答えを a.~ d.の中から一つ選べ。

Why did sleep evolve? At first si	ght, sleep appears to be with survival because i
prevents feeding and procreation and co	ould expose the sleeper to attack by predators. Sleep mus
confer some essential benefits to to	
Some theorists have argued that	sleep helps to forge new neural connections and solidif
	that sleep allows the brain to filter out unimportan
connections. It may also help the brain re	epair itself.
These explanations are not consister	ntly supported by empirical evidence, however, and do no
	volved a wide range of sleep-wake cycles. (5) of the
theories even contradict one another. Co	ertain animals, such as American black bears and fat-tailed
	nths, whereas others, especially birds and small mammals
	last a single night or less. The big brown bat, for example
	rn killer whales and dolphins hardly sleep for weeks if they
are born during a migration; the same go	es for their mothers.
One plausible explanation for this v	ariation in sleep patterns is, from an evolutionary
perspective, sleep and related states p.	rovide periods of adaptive inactivity. Contrary to first
impressions, animals may sometimes be l	ess vulnerable to attack by predators while asleep. When
an animal is awake and maneuvering in i	ts environment, it can forage for food, eat and mate, but it
will also expend energy by engaging in su	ch behaviors and can wander into harm's way.
	nat species are not active when they are most vulnerable to
	scarce. The big brown bat need not be awake for more
than four hours a day given that the ins	sects it feeds are active only for a few hours each
evening. If it were flying around during	the day, the bat would more easily attract the attention of
	ns to serve many roles, sleep patterns across species may
enhance survival by optimizing the timing	of activity and idleness also allowing us to maintain
the most agile brains.	uoj
•	
1. a. contradictory	b. opposed
c. incompatible	d. unnecessary
2. a. decrease	b. outweigh
c. modify	d. displace

3. a. whereas

c. because

b. which

d. since

4. a. what

c. when

b. how

d. why

5. a. None

c. Some

b. Almost

d. Any

6. a. In contrast

c. Consequently

b. In the same way

d. Specifically

7. a. how

c. what

b. why

d. that

8. a. ensure

c. prove

b. confirm

d. certify

9. a. which

c. that

b. on which

d. on that

10. a. when

c. by

b. while

d. if

4

Since the advent of the deadline, procrastinators have suffered society's barbs for putting off (1) until later what needs doing now. But it turns out that many people appear to be finishing things sooner than they need to get them done. They are "precrastinators," researchers say.

"There is an overwhelming tendency to precrastinate," according to a paper published in May in the journal Psychological Science. The behavior might include answering trivial emails, for example, or paying bills far ahead of time. "It's an irrational choice," the paper said, but it also reflects the significant trade-offs people make to keep from feeling overwhelmed.

The paper described an experiment at Pennsylvania State University that was meant to explore decision-making when it comes to physical effort. Students were asked to carry a beach bucket down an alley. They were given a choice: They could pick up a bucket near the start of the alley and carry it to the end, or they could pick up a different bucket that was closer to the end of the alley, walk a few steps and put it down.

The researchers assumed that most of the subjects would choose the bucket that required the least amount of lifting time. Instead, most picked up the bucket that was closer to them, a decision that forced them to carry it longer than necessary. In other words, they gave themselves extra work for no apparent benefit. "We couldn't figure out what on earth was going on," said the lead (6) researcher, David Rosenbaum, a professor of psychology at Penn State [Pennsylvania State University]. "We thought maybe we made a mistake with the instructions." To confirm their observations, and to better understand this seemingly counterintuitive habit, the researchers performed eight more experiments. For instance, in several of them, the buckets were filled with pennies (coins), and thus heavier to carry — and still the subjects tended to pick up the first bucket, adding unnecessary work.

Through the experiments, the researchers homed in on a hypothesis: People appear wired to incur a significant physical cost to eliminate a mental burden. In particular, Dr. Rosenbaum said, (7) people are seeking ways to limit the burden to their "working memory," a critical but highly limited mental resource that people use to perform immediate tasks. By picking up the bucket earlier, the subjects were eliminating the need to remember to do it later. In essence, they were freeing their brains to focus on other potential tasks.

The implications are widespread, scholars said. For one, the findings help explain the lure of (8) self-help gurus who urge people to keep their inboxes empty and finish even trivial tasks as soon as they come in.

But there can be downsides to getting things done early, particularly in the digital era, said Alan Castel, an associate professor of psychology at the University of California, Los Angeles. Cellphones,

computers, and other technology are powerful tools that let people tackle a constant stream of tasks, but they can also become hard to ignore, given people's powerful desire to want to complete those tasks, he said.

"You're constantly lured into answering email or answering a phone call." Professor Castel said. But as the Penn State experiment indicates, getting small tasks out of the way might collectively consume significant resources.

"People who are checking things off the list all the time might look like they're getting stuff done." he said, "but they're not getting the big stuff done."

- 1. The word "advent" is closest in meaning to
 - a. occurrence
 - b. closure
 - c. delay
 - d. appearance
- 2. Which of the following choices is closest in meaning to the underlined part?
 - a. Many people want to appear to be getting things done when in fact they are not doing them sooner.
 - b. Completing tasks sooner helps many people to make sure that they get them done properly.
 - c. It is usually necessary for people to get things done as quickly as possible so that they can appear to be finished.
 - d. Many people will rush to do things before it is necessary to do them.
- 3. The word "trivial" is closest in meaning to
 - a. insignificant
 - b. recreational
 - c. personal
 - d. forbidden
- 4. The word "irrational" is closest in meaning to
 - a. irresponsible
 - b. unconscious
 - c. illogical
 - d. impossible

6. T	'he word "apparent" is closest in meaning to
a	realistic
b.	obvious
с.	significant
d .	physical
7. T	he word "eliminate" is closest in meaning to
a.	improve
b.	reject
с.	extend
d.	remove
8. T	he word "lure" is closest in meaning to
a .	deterrent
· b.	attraction
С.	value
d .	tension
	•

5. The word "assumed" is closest in meaning to

a. expectedb. decidedc. realizedd. confirmed

- 9. Which of the following choices is closest in meaning to the underlined part?
 - a. Technology, including computers and cellphones, allows people to manage a never-ending flow of jobs, and this, combined with the natural impulse that people have to finish every assignment that comes in, makes people feel compelled to take care of those tasks right away.
- b. Modern technology such as computers and cellphones is too powerful for most people to handle the stream of tasks that are constantly coming at them, and, as a result, most people end up ignoring those tasks.
- c. People have a natural desire to finish tasks as soon as they appear, and today's powerful, modern technology such as computers and cellphones means that people no longer need to put off the tasks that are constantly coming at them.
- d. Cellphones, computers, and modern technology have created a never-ending stream of tasks that requires powerful tools to handle; and this prevents people from ignoring their desire to complete other tasks.
- 10. According to the text, why do people precrastinate?
 - a. Because they do not know that they are precrastinating.
 - b. Because precrastinating is shown to have many benefits.
 - c. Because they like making difficult choices.
 - d. Because they do not like having unfinished tasks.
- 11. What was the experiment done by researchers at Pennsylvania State University?
 - a. Students had to choose between carrying a bucket that was close to them for a long distance or carrying a bucket that was farther from them for a short distance.
 - b. Students had to carry a bucket a long way from the front to the back of an alley, and then go back to carry another bucket a short distance from near the end to the back of the alley.
 - c. Students had a choice of carrying one bucket a long distance or carrying two buckets a shorter distance.
 - d. Students could either carry one bucket from the front to the back of an alley, or they could carry another bucket from the back to the front of the alley.

- 12. According to the text, what happened during the experiment?
 - a. Most of the students chose to carry both buckets to the end of the alley rather than carry only one bucket.
 - b. Most of the students chose to carry the bucket placed near the front to the end of the alley even though that meant that they would have to carry the bucket for a longer distance.
 - c. Most of the students carried only one bucket at a time rather than both buckets at the same time, which meant that they would have to walk twice as far.
 - d. Almost none of the students saw the benefit of carrying the bucket that was closer to the start of the alley.
- 13. Why were the researchers surprised by the results of the experiment?
 - a. Because most of the students did not follow their instructions on how to carry the buckets correctly.
 - b. Because most of the students carried the buckets to the wrong place.
 - c. Because most of the students chose to put more effort into carrying the buckets than was necessary.
 - d. Because most of the students chose to carry the heavier buckets that were full of pennies rather than the lighter buckets.
- 14. What was a possible reason that the researchers considered for the results of the experiment?
 - a. The test subjects did not have enough working memory to know which buckets they should choose.
 - b. The test subjects had difficulty making clear decisions if they were making too much physical effort,
 - c. The test subjects liked carrying the buckets that were heavier because it gave them a better sense of accomplishment, as if they had completed a harder task.
 - d. The test subjects chose the closer buckets because then they could feel that the task had begun and they did not have to think about it anymore.

- 15. According to the text, what is a possible negative aspect of wanting to finish tasks earlier?
 - a. People can become too dependent on cellphones and technology that help them finish their tasks sooner, and they forget how to do other tasks.
 - b. People might end up ignoring the minor tasks that come in if they are too eager to do the big tasks.
 - c. People can spend so much effort doing every minor task that is presented to them that they will use up too much of their mental energy.
 - d. People may become too dependent on doing tasks according to lists and will make too many mistakes.

- 5 設問 1. ~10. の英文のそれぞれについて、誤りを含んだ下線部の記号を、 a. ~ d. の中から一つ選べ。
 - 1. I think that there are many possible reasons for the fail of the project.
 - 2. Many people around the world face an uncertain future because automation and the changing nature of the economy.
 - 3. The increasing popularity of smart phones and other hand-held portable devices has revolutionized way people receive their entertainment today.
 - 4. After the last disaster, the government decided to review its procedures for respond to emergencies.
 - 5. The companies ability to meet the demands of its customers has greatly improved since changing to the more advanced inventory software.
 - 6. We need much more informations before we can decide whether our proposal is feasible or not.
 - 7. Polls show confidence on the prime minister rising by 11% since his new plan for the economy was revealed.
 - 8. My experience has been that on a rainy day I need to leave home for at least 10 minutes earlier than usual if I am to get to work on time.
 - 9. Drugs can be divided to several categories depending on their effects on the patient.
 - 10. The conclusion of the investigating committee was that the incorrect mixture of the chemicals were to blame for the accident.