



**ENTRI**

# **OET**

## STUDY MATERIAL

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**READING**

## Tetanus: Texts

**Text A**

Tetanus is a severe disease that can result in serious illness and death. Tetanus vaccination protects against the disease.

Tetanus (sometimes called lock-jaw) is a disease caused by the bacteria *Clostridium tetani*. Toxins made by the bacteria attack a person's nervous system. Although the disease is fairly uncommon, it can be fatal.

Early symptoms of tetanus include:

- Painful muscle contractions that begin in the jaw (lock jaw)
- Rigidity in neck, shoulder and back muscles
- Difficulty swallowing
- Violent generalized muscle spasms
- Convulsions
- Breathing difficulties

A person may have a fever and sometimes develop abnormal heart rhythms. Complications include pneumonia, broken bones (from the muscle spasms), respiratory failure and cardiac arrest.

There is no specific diagnostic laboratory test; diagnosis is made clinically. The spatula test is useful: touching the back of the pharynx with a spatula elicits a bite reflex in tetanus, instead of a gag reflex.

**Text B****Tetanus Risk**

Tetanus is an acute disease induced by the toxin tetanus bacilli, the spores of which are present in soil.

**A TETANUS-PRONE WOUND IS:**

- any wound or burn that requires surgical intervention that is delayed for > 6 hours
- any wound or burn at any interval after injury that shows one or more of the following characteristics:
  - a significant degree of tissue damage
  - puncture-type wound particularly where there has been contact with soil or organic matter which is likely to harbour tetanus organisms
- any wound from compound fractures
- any wound containing foreign bodies
- any wound or burn in patients who have systemic sepsis
- any bite wound
- any wound from tooth re-implantation

Intravenous drug users are at greater risk of tetanus. Every opportunity should be taken to ensure that they are fully protected against tetanus. Booster doses should be given if there is any doubt about their immunisation status.

Immunosuppressed patients may not be adequately protected against tetanus, despite having been fully immunised. They should be managed as if they were incompletely immunised.

## Text C

### Tetanus Immunisation following injuries

Thorough cleaning of the wound is essential irrespective of the immunisation history of the patient, and appropriate antibiotics should be prescribed.

Immunisation Status	Clean Wound	Tetanus-prone wound	
		Vaccine	Human Tetanus Immunoglobulin (HTIG)
Fully immunised <sup>1</sup>	Not required	Not required	Only if high risk <sup>2</sup>
Primary immunisation complete, boosters incomplete but up to date	Not required	Not required	Only if high risk <sup>2</sup>
Primary immunisation incomplete or boosters not up to date	Reinforcing dose and further doses to complete recommended schedule	Reinforcing dose and further doses to complete recommended schedule	Yes (opposite limb to vaccine)
Not immunised or immunisation status not known/uncertain <sup>3</sup>	Immediate dose of vaccine followed by completion of full 5-dose course	Immediate dose of vaccine followed by completion of full 5-dose course	Yes (opposite limb to vaccine)

#### Notes

1. has received total of 5 doses of vaccine at appropriate intervals
2. heavy contamination with material likely to contain tetanus spores and/or extensive devitalised tissue
3. immunosuppressed patients presenting with a tetanus-prone wound should always be managed as if they were incompletely immunised

## Text D

### **Human Tetanus Immunoglobulin (HTIG)**

#### Indications

- treatment of clinically suspected cases of tetanus
- prevention of tetanus in high-risk, tetanus-prone wounds

#### Dose

Available in 1ml ampoules containing 250IU

Prevention Dose	Treatment Dose
250 IU by IM injection <sup>1</sup> Or 500 IU by IM injection <sup>1</sup> if >24 hours since injury/risk of heavy contamination/burns 5,000 – 10,000 IU by IV infusion Or 150 IU/kg by IM injection <sup>1</sup> (given in multiple sites) if IV preparation unavailable	

<sup>1</sup> Due to its viscosity, HTIG should be administered slowly, using a 23 gauge needle

#### Contraindications

- Confirmed anaphylactic reaction to tetanus containing vaccine
- Confirmed anaphylactic reaction to neomycin, streptomycin or polymyxin B

#### Adverse reactions

Local – pain, erythema, induration (Arthus-type reaction)

General – pyrexia, hypotonic-hyporesponsive episode, persistent crying

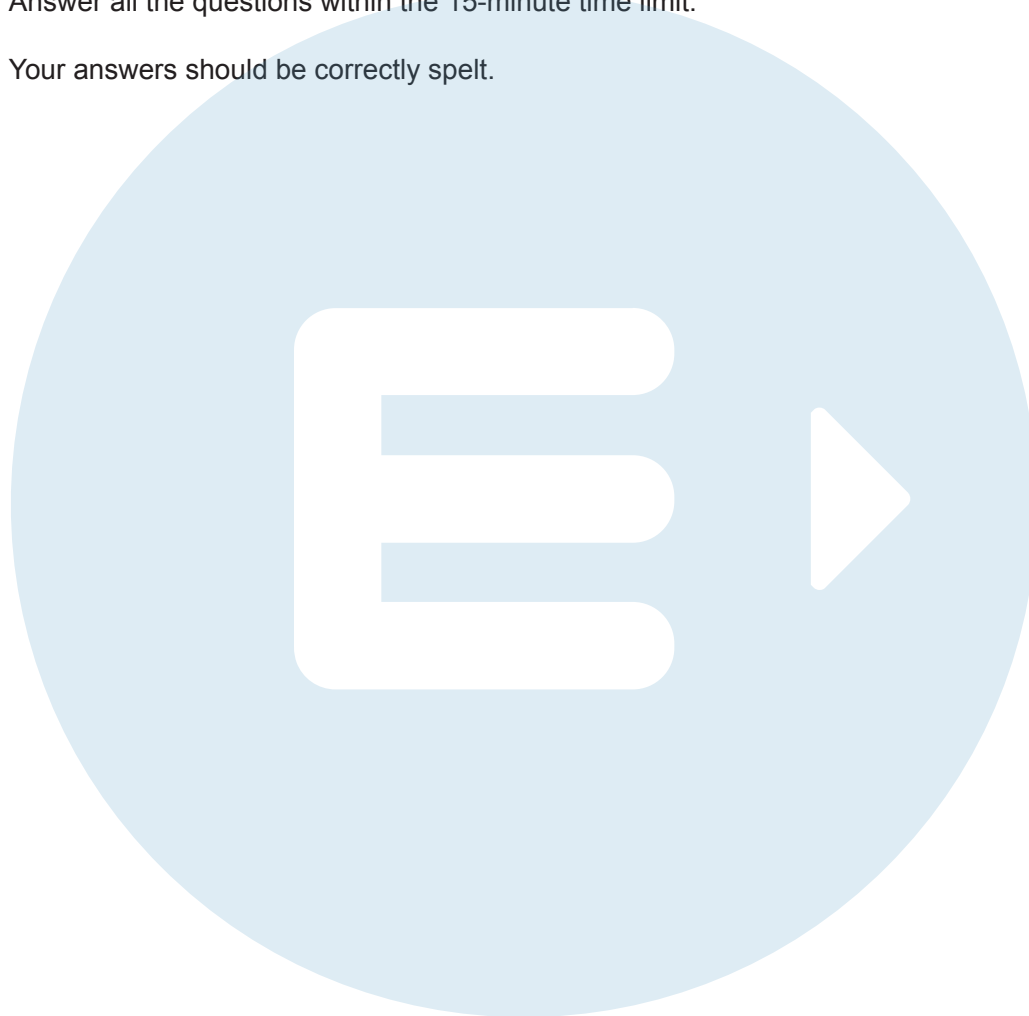
**END OF PART A**

**THIS TEXT BOOKLET WILL BE COLLECTED**

## Part A

**TIME: 15 minutes**

- Look at the four texts, **A-D**, in the separate **Text Booklet**.
- For each question, **1-20**, look through the texts, **A-D**, to find the relevant information.
- Write your answers on the spaces provided in this **Question Paper**.
- Answer all the questions within the 15-minute time limit.
- Your answers should be correctly spelt.



## Tetanus: Questions

### Questions 1-6

For each question, **1-6**, decide which text (**A, B, C** or **D**) the information comes from.

You may use any letter more than once.

In which text can you find information about

- 1 the type of injuries that may lead to tetanus? \_\_\_\_\_
- 2 signs that a patient may have tetanus? \_\_\_\_\_
- 3 how to decide whether a tetanus vaccine is necessary? \_\_\_\_\_
- 4 an alternative name for tetanus? \_\_\_\_\_
- 5 possible side-effects of a particular tetanus medication? \_\_\_\_\_
- 6 other conditions which are associated with tetanus? \_\_\_\_\_

### Questions 7-13

Complete each of the sentences, **7-13**, with a word or short phrase from one of the texts. Each answer may include words, numbers or both.

#### Patients at increased risk of tetanus:

- 7 If a patient has been touching \_\_\_\_\_ or earth, they are more susceptible to tetanus.
- 8 Any \_\_\_\_\_ lodged in the site of an injury will increase the likelihood of tetanus.
- 9 Patients with \_\_\_\_\_ fractures are prone to tetanus.
- 10 Delaying surgery on an injury or burn by more than \_\_\_\_\_ increases the probability of tetanus.
- 11 If a burns patient has been diagnosed with \_\_\_\_\_ they are more liable to contract tetanus.
- 12 A patient who is \_\_\_\_\_ or a regular recreational drug user will be at greater risk of tetanus.

**Management of tetanus-prone injuries:**

- 13 Clean the wound thoroughly and prescribe \_\_\_\_\_ if necessary, followed by tetanus vaccine and HTIG as appropriate.

**Questions 14-20**

Answer each of the questions, **14-20**, with a word or short phrase from one of the texts. Each answer may include words, numbers or both.

- 14 Where will a patient suffering from tetanus first experience muscle contractions?

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- 15 What can muscle spasms in tetanus patients sometimes lead to?

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- 16 If you test for tetanus using a spatula, what type of reaction will confirm the condition?

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- 17 How many times will you have to vaccinate a patient who needs a full course of tetanus vaccine?

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- 18 What should you give a drug user if you're uncertain of their vaccination history?

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- 19 What size of needle should you use to inject HTIG?

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- 20 What might a patient who experienced an adverse reaction to HTIG be unable to stop doing?

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**END OF PART A  
THIS QUESTION PAPER WILL BE COLLECTED**

## Part B

In this part of the test, there are six short extracts relating to the work of health professionals. For **questions 1-6**, choose answer (**A**, **B** or **C**) which you think fits best according to the text.

1. Nursing staff can remove a dressing if
- A** a member of the surgical team is present.
  - B** there is severe leakage from the wound.
  - C** they believe that the wound has healed.

### Post-operative dressings

Dressings are an important component of post-operative wound management. Any dressings applied during surgery have been done in sterile conditions and should ideally be left in place, as stipulated by the surgical team. It is acceptable for initial dressings to be removed prematurely in order to have the wound reviewed and, in certain situations, apply a new dressing. These situations include when the dressing is no longer serving its purpose (i.e. dressing falling off, excessive exudate soaking through the dressing and resulting in a suboptimal wound healing environment) or when a wound complication is suspected.



2. As explained in the protocol, the position of the RUM container will ideally
- (A) encourage participation in the scheme.
  - (B) emphasise the value of recycling.
  - (C) facilitate public access to it.

**Unwanted medicine: pharmacy collection protocol**

A Returned Unwanted Medicine (RUM) Project approved container will be delivered by the wholesaler to the participating pharmacy.

The container is to be kept in a section of the dispensary or in a room or enclosure in the pharmacy to which the public does not have access. The container may be placed in a visible position, but out of reach of the public, as this will reinforce the message that unwanted prescription drugs can be returned to the pharmacy and that the returned medicines will not be recycled.

Needles, other sharps and liquid cytotoxic products should not be placed in the container, but in one specifically designed for such waste.

3. The report mentioned in the memo suggests that
- (A) data about patient errors may be incomplete.
  - (B) errors by hospital staff can often go unreported.
  - (C) errors in prescriptions pose the greatest threat to patients.

**Memo: Report on oral anti-cancer medications**

Nurse Unit Managers are directed to review their systems for the administration of oral anti-cancer drugs, and the reporting of drug errors. Serious concerns have been raised in a recent report drawing on a national survey of pharmacists.

Please note the following paragraph quoted from the report:

Incorrect doses of oral anti-cancer medicines can have fatal consequences. Over the previous four years, there were three deaths and 400 patient safety issues involving oral anti-cancer medicines. Half of the reports concerned the wrong dosage, frequency, quantity or duration of oral anti-cancer treatment. Of further concern is that errors on the part of patients may be under-reported. In light of these reports, there is clearly a need for improved systems covering the management of patients receiving oral therapies.

4. What point does the training manual make about anaesthesia workstations?
- (A) Parts of the equipment have been shown to be vulnerable to failure.
  - (B) There are several ways of ensuring that the ventilator is working effectively.
  - (C) Monitoring by health professionals is a reliable way to maintain patient safety.

#### **Anaesthesia Workstations**

Studies on safety in anaesthesia have documented that human vigilance alone is inadequate to ensure patient safety and have underscored the importance of monitoring devices. These findings are reflected in improved standards for equipment design, guidelines for patient monitoring and reduced malpractice premiums for the use of capnography and pulse oximetry during anaesthesia. Anaesthesia workstations integrate ventilator technology with patient monitors and alarms to help prevent patient injury in the unlikely event of a ventilator failure. Furthermore, since the reservoir bag is part of the circuit during mechanical ventilation, the visible movement of the reservoir bag is confirmation that the ventilator is functioning.

5. In cases of snakebite, the flying doctor should be aware of

- (A) where to access specific antivenoms.
- (B) the appropriate method for wound cleaning.
- (C) the patients most likely to suffer complications.

**Memo to Flying Doctor staff: Antivenoms for snakebite**

Before starting treatment:

- Do not wash the snakebite site.
- If possible, determine the type of snake by using a 'snake-venom detection kit' to test a bite site swab or, in systemic envenoming, the person's urine. If venom detection is not available or has proved negative, seek advice from a poisons information centre.
- Testing blood for venom is not reliable.
- Assess the degree of envenoming; not all confirmed snakebites will result in systemic envenoming; risk varies with the species of snake.
- People with pre-existing renal, hepatic, cardiac or respiratory impairment and those taking anticoagulant or antiplatelet drugs may have an increased risk of serious outcome from snakebite. Children are also especially at increased risk of severe envenoming because of smaller body mass and the likelihood of physical activity immediately after a bite.

6. What was the purpose of the BMTEC forum?

- A to propose a new way of carrying out cleaning audits
- B to draw conclusions from the results of cleaning audits
- C to encourage more groups to undertake cleaning audits

#### Cleaning Audits

Three rounds of environmental cleaning audits were completed in 2013-2014. Key personnel in each facility were surveyed to assess the understanding of environmental cleaning from the perspective of the nurse unit manager, environmental services manager and the director of clinical governance. Each facility received a report about their environmental cleaning audits and lessons learned from the surveys. Data from the 15 units were also provided to each facility for comparison purposes.

The knowledge and experiences from the audits were shared at the BMTEC Forum in August 2014. This forum allowed environmental services managers, cleaners, nurses and clinical governance to discuss the application of the standards and promote new and improved cleaning practice. The second day of the forum focused on auditor training and technique with the view of enhancing internal environmental cleaning auditing by the participating groups.

## Part C

In this part of the test, there are two texts about different aspects of healthcare. For **questions 7-22**, choose the answer (**A, B, C** or **D**) which you think fits best according to the text.

### Text 1: Does homeopathy 'work'?

*For many, homeopathy is simply unscientific, but regular users hold a very different view.*

Homeopathy works by giving patients very dilute substances that, in larger doses, would cause the very symptoms that need curing. Taking small doses of these substances – derived from plants, animals or minerals – strengthens the body's ability to heal and increases resistance to illness or infection. Or that is the theory. The debate about its effectiveness is nothing new. Recently, Australia's National Health and Medical Research Council (NHMRC) released a paper which found there were 'no health conditions for which there was reliable evidence that homeopathy was effective'. This echoed a report from the UK House of Commons which said that the evidence failed to show a 'credible physiological mode of action' for homeopathic products, and that what data were available showed homeopathic products to be no better than placebo. Yet Australians spend at least \$11 million per year on homeopathy.

So what's going on? If Australians – and citizens of many other nations around the world – are voting with their wallets, does this mean homeopathy must be doing something right? 'For me, the crux of the debate is a disconnect between how the scientific and medical community view homeopathy, and what many in the wider community are getting out of it,' says Professor Alex Broom of the University of Queensland. 'The really interesting question is how can we possibly have something that people think works, when to all intents and purposes, from a scientific perspective, it doesn't?'

Part of homeopathy's appeal may lie in the nature of the patient-practitioner consultation. In contrast to a typical 15-minute GP consultation, a first homeopathy consultation might take an hour and a half. 'We don't just look at an individual symptom in isolation. For us, that symptom is part of someone's overall health condition,' says Greg Cope, spokesman for the Australian Homeopathic Association. 'Often we'll have a consultation with someone and find details their GP simply didn't have time to.' Writer Johanna Ashmore is a case in point. She sees her homeopath for a one-hour monthly consultation. 'I feel, if I go and say I've got this health concern, she's going to treat my body to fight it rather than just treat the symptom.'

Most people visit a homeopath after having received a diagnosis from a 'mainstream' practitioner, often because they want an alternative choice to medication, says Greg Cope. 'Generally speaking, for a homeopath, their preference is if someone has a diagnosis from a medical practitioner before starting homeopathic treatment, so it's rare for someone to come and see us with an undiagnosed condition and certainly if they do come undiagnosed, we'd want to refer them on and get that medical evaluation before starting a course of treatment,' he says.

Given that homeopathic medicines are by their very nature incredibly dilute – and, some might argue, diluted beyond all hope of efficacy – they are unlikely to cause any adverse effects, so where’s the harm? Professor Paul Glasziou, chair of the NHMRC’s Homeopathy Working Committee, says that while financial cost is one harm, potentially more harmful are the non-financial costs associated with missing out on effective treatments. ‘If it’s just a cold, I’m not too worried. But if it’s for a serious illness, you may not be taking disease-modifying treatments, and most worrying is things like HIV which affect not only you, but people around you,’ says Glasziou. This is a particular concern with homeopathic vaccines, he says, which jeopardise the ‘herd immunity’ – the immunity of a significant proportion of the population – which is crucial in containing outbreaks of vaccine-preventable diseases.

The question of a placebo effect inevitably arises, as studies repeatedly seem to suggest that whatever benefits are being derived from homeopathy are more a product of patient faith rather than of any active ingredient of the medications. However, Greg Cope dismisses this argument, pointing out that homeopathy appears to benefit even the sceptics: ‘We might see kids first, then perhaps Mum and after a couple of years, Dad will follow and, even though he’s only there reluctantly, we get wonderful outcomes. This cannot be explained simply by the placebo effect.’ As a patient, Johanna Ashmore is aware scientific research does little to support homeopathy but can still see its benefits. ‘If seeing my homeopath each month improves my health, I’m happy. I don’t care how it works, even if it’s all in the mind – I just know that it does.’

But if so many people around the world are placing their faith in homeopathy, despite the evidence against it, Broom questions why homeopathy seeks scientific validation. The problem, as he sees it, lies in the fact that ‘if you’re going to dance with conventional medicine and say “we want to be proven to be effective in dealing with discrete physiological conditions”, then you indeed do have to show efficacy. In my view this is not about broader credibility per se, it’s about scientific and medical credibility – there’s actually quite a lot of cultural credibility surrounding homeopathy within the community but that’s not replicated in the scientific literature.’

## Text 1: Questions 7-14

7. The two reports mentioned in the first paragraph both concluded that homeopathy
- (A) could be harmful if not used appropriately.
  - (B) merely works on the same basis as the placebo effect.
  - (C) lacks any form of convincing proof of its value as a treatment.
  - (D) would require further investigation before it was fully understood.
8. When commenting on the popularity of homeopathy, Professor Broom shows his
- (A) surprise at people's willingness to put their trust in it.
  - (B) frustration at scientists' inability to explain their views on it.
  - (C) acceptance of the view that the subject may merit further study.
  - (D) concern over the risks people face when receiving such treatment.
9. Johanna Ashmore's views on homeopathy highlight
- (A) how practitioners put their patients at ease.
  - (B) the key attraction of the approach for patients.
  - (C) how it suits patients with a range of health problems.
  - (D) the opportunities to improve patient care which GPs miss.
10. In the fourth paragraph, it is suggested that visits to homeopaths
- (A) occasionally depend on a referral from a mainstream doctor.
  - (B) frequently result from a patient's treatment preferences.
  - (C) should be preceded by a visit to a relevant specialist.
  - (D) often reveal previously overlooked medical problems.



11. What particularly concerns Professor Glasziou?
- (A) the risks to patients of relying on homeopathic vaccinations
  - (B) the mistaken view that homeopathic treatments can only do good
  - (C) the way that homeopathic remedies endanger more than just the user
  - (D) the ineffectiveness of homeopathic remedies against even minor illnesses
12. Greg Cope uses the expression 'wonderful outcomes' to underline
- (A) the ability of homeopathy to defy its scientific critics.
  - (B) the value of his patients' belief in the whole process.
  - (C) the claim that he has solid proof that homeopathy works.
  - (D) the way positive results can be achieved despite people's doubts.
13. From the comments quoted in the sixth paragraph, it is clear that Johanna Ashmore is
- (A) prepared to accept that homeopathy may depend on psychological factors.
  - (B) happy to admit that she was uncertain at first about proceeding.
  - (C) sceptical about the evidence against homeopathic remedies.
  - (D) confident that research will eventually validate homeopathy.
14. What does the word 'this' in the final paragraph refer to?
- (A) the continuing inability of homeopathy to gain scientific credibility
  - (B) the suggestion that the scientific credibility of homeopathy is in doubt
  - (C) the idea that there is no need to pursue scientific acceptance for homeopathy
  - (D) the motivation behind the desire for homeopathy to gain scientific acceptance

## Text 2: Brain-controlled prosthetics

Paralysed from the neck down by a stroke, Cathy Hutchinson stared fixedly at a drinking straw in a bottle on the table in front of her. A cable rose from the top of her head, connecting her to a robot arm, but her gaze never wavered as she mentally guided the robot arm, which was opposite her, to close its grippers around the bottle, then slowly lift the vessel towards her mouth. Only when she finally managed to take a sip did her face relax. This example illustrates the strides being taken in brain-controlled prosthetics. But Hutchinson's focused stare also illustrates the one crucial feature still missing from prosthetics. Her eyes could tell her where the arm was, but she couldn't feel what it was doing.

Prosthetics researchers are now trying to create prosthetics that can 'feel'. It's a **daunting** task: the researchers have managed to read signals from the brain; now they must write information into the nervous system. Touch encompasses a complicated mix of information – everything from the soft prickliness of wool to the slipping of a sweaty soft-drink can. The sensations arise from a host of receptors in the skin, which detect texture, vibration, pain, temperature and shape, as well as from receptors in the muscles, joints and tendons that contribute to 'proprioception' – the sense of where a limb is in space. Prosthetics are being outfitted with sensors that can gather many of these sensations, but the challenge is to get the resulting signals flowing to the correct part of the brain.

For people who have had limbs amputated, the obvious way to achieve that is to route the signals into the remaining nerves in the stump, the part of the limb left after amputation. Ken Horch, a neuroprosthetics researcher, has done just that by threading electrodes into the nerves in stumps then stimulating them with a tiny current, so that patients felt like their fingers were moving or being touched. The technique can even allow patients to distinguish basic features of objects: a man who had lost his lower arms was able to determine the difference between blocks made of wood or foam rubber by using a sensor-equipped prosthetic hand. He correctly identified the objects' size and softness more than twice as often as would have been expected by chance. Information about force and finger position was delivered from the prosthetic to a computer, which prompted stimulation of electrodes implanted in his upper-arm nerves.

As promising as this result was, researchers will probably need to stimulate hundreds or thousands of nerve fibres to create complex sensations, and they'll need to keep the devices working for many years if they are to minimise the number of surgeries required to replace them as they wear out. To get around this, some researchers are instead trying to give patients sensory feedback by touching their skin. The technique was discovered by accident by researcher Todd Kuiken. The idea was to rewire arm nerves that used to serve the hand, for example, to muscles in other parts of the body. When the patient thought about closing his or her hand, the newly targeted muscle would contract and generate an electric signal, driving movement of the prosthetic.

However, this technique won't work for stroke patients like Cathy Hutchinson. So some researchers are skipping directly to the brain. In principle, this should be straightforward. Because signals from specific parts of the body go to specific parts of the brain, scientists should be able to create sensations of touch or proprioception in the limb by directly activating the neurons that normally receive those signals. However, with electrical stimulation, all neurons close to the electrode's tip are activated indiscriminately, so 'even if I had the sharpest needle in the Universe, that could create unintended effects', says Arto Nurmikko, a neuroengineer. For example, an attempt to create sensation in one finger might produce sensation in other parts of the hand as well, he says.

Nurmikko and other researchers are therefore using light, in place of electricity, to activate highly specific groups of neurons and recreate a sense of touch. They trained a monkey to remove its hand from a pad when it vibrated. When the team then stimulated the part of its brain that receives tactile information from the hand with a light source implanted in its skull, the monkey lifted its hand off the pad about 90% of the time. The use of such techniques in humans is still probably 10–20 years away, but it is a promising strategy.

Even if such techniques can be made to work, it's unclear how closely they will approximate natural sensations. Tingles, pokes and vibrations are still **a far cry from** the complicated sensations that we feel when closing a hand over an apple, or running a finger along a table's edge. But patients don't need a perfect sense of touch, says Douglas Weber, a bioengineer. Simply having enough feedback to improve their control of grasp could help people to perform tasks such as picking up a glass of water, he explains. He goes on to say that patients who wear cochlear implants, for example, are often happy to regain enough hearing to hold a phone conversation, even if they're still unable to distinguish musical subtleties.

## Text 2: Questions 15-22

15. What do we learn about the experiment Cathy Hutchinson took part in?
- (A) It required intense concentration.
  - (B) It failed to achieve what it had set out to do.
  - (C) It could be done more quickly given practice.
  - (D) It was the first time that it had been attempted.
16. The task facing researchers is described as 'daunting' because
- (A) signals from the brain can be misunderstood.
  - (B) it is hard to link muscle receptors with each other.
  - (C) some aspects of touch are too difficult to reproduce.
  - (D) the connections between sensors and the brain need to be exact.
17. What is said about the experiment done on the patient in the third paragraph?
- (A) There was statistical evidence that it was successful.
  - (B) It enabled the patient to have a wide range of feeling.
  - (C) Its success depended on when amputation had taken place.
  - (D) It required the use of a specially developed computer program.
18. What drawback does the writer mention in the fourth paragraph?
- (A) The devices have a high failure rate.
  - (B) Patients might have to undergo too many operations.
  - (C) It would only be possible to create rather simple sensations.
  - (D) The research into the new technique hasn't been rigorous enough.

19. What point is made in the fifth paragraph?
- (A) Severed nerves may be able to be reconnected.
  - (B) More research needs to be done on stroke victims.
  - (C) Scientists' previous ideas about the brain have been overturned.
  - (D) It is difficult for scientists to pinpoint precise areas with an electrode.
20. What do we learn about the experiment that made use of light?
- (A) It can easily be replicated in humans.
  - (B) It worked as well as could be expected.
  - (C) It may have more potential than electrical stimulation.
  - (D) It required more complex surgery than previous experiments.
21. In the final paragraph, the writer uses the phrase 'a far cry from' to underline
- (A) how much more there is to achieve.
  - (B) how complex experiments have become.
  - (C) the need to reduce people's expectations.
  - (D) the differences between types of artificial sensation.
22. Why does Weber give the example of a cochlear implant?
- (A) to underline the need for a similar breakthrough in prosthetics
  - (B) to illustrate the fact that some sensation is better than none
  - (C) to highlight the advances made in other areas of medicine
  - (D) to demonstrate the ability of the body to relearn skills