

NECROTISING FASCIITIS (NF)

TEXT A

Necrotizing fasciitis (NF) is a severe, rare, potentially lethal soft tissue infection that develops in the scrotum and perineum, the abdominal wall, or the extremities. The infection progresses rapidly, and septic shock may ensue; hence, the mortality rate is high (median mortality 32.2%). NF is classified into four types, depending on microbiological findings.

Table 1

Classification of responsible pathogens according to type of infection

Microbiological type	Pathogens	Site of infection	Co-morbidities
Type 1 (polymicrobial)	Obligate and facultative anaerobic	Trunk and perineum	Diabetes Mellitus
Type 2 (monomicrobial)	Beta-haemolytic streptococcus A	Limbs	
Type 3	<i>Clostridium</i> species Gram-negative bacteria Vibrios spp. <i>Aeromonas hydrophilia</i>	Limbs, trunk and perineum	Trauma Seafood consumption (for <i>Aeromonas</i>)
Type 4	<i>Candida</i> spp. <i>Zygomycetes</i>	Limbs, trunk, perineum	Immuno-suppression

TEXT B

Antibiotic treatment for NF

Type 1

- Initial treatment includes ampicillin or ampicillin-sulbactam combined with metronidazole or clindamycin.
- Broad gram-negative coverage is necessary as an initial empirical therapy for patients who have recently been treated with antibiotics, or been hospitalized. In such cases, antibiotics such as ampicillin-sulbactam, piperacillin-tazobactam, ticarcillin-clavulanate acid, third or fourth generation cephalosporins, or carbapenems are used, and at a higher dosage.

Type 2

- First or second generation of cephalosporins are used for the coverage of methicillin-sensitive *Staphylococcus aureus* (MSSA).
- MRSA tends to be covered by vancomycin, or daptomycin and linezolid in cases where *S. aureus* is resistant to vancomycin.

Type 3

- NF should be managed by Clindamycin and penicillin, which kill the *Clostridium* species.
- If Vibrio infection is suspected, the early use of tetracyclines (including doxycycline and minocycline) and third-generation cephalosporins is crucial for the survival of the patient since these antibiotics have been shown to reduce the mortality rate drastically.

Type 4

- Can be treated with amphotericin B or fluconazole, but the results of this treatment are generally disappointing.

Antibiotics should be administered for up to 5 days after local signs and symptoms have resolved. The mean duration of antibiotic therapy for NF is 4-6 weeks.

Text C

Supportive care in an ICU is critical to NF survival. This involves fluid resuscitation, cardiac monitoring, aggressive wound care, and adequate nutritional support. Patients with NF are in a catabolic state and require increased caloric intake to combat infection. This can be delivered orally or via nasogastric tube, peg tube, or intravenous hyperalimentation. This should begin immediately (within the first 24 hours of hospitalization). Prompt and aggressive support has been shown to lower complication rates. Baseline and repeated monitoring of albumin, prealbumin, transferrin, blood urea nitrogen, and triglycerides should be performed to ensure the patient is receiving adequate nutrition.

Wound care is also an important concern. Advanced wound dressings have replaced wet-to-dry dressings. These dressings promote granulation tissue formation and speed healing. Advanced wound dressing may lend to healing or prepare the wound bed for grafting. A healthy wound bed increases the chances of split-thickness skin graft take. Vacuum-assisted closure (VAC) was recently reported to be effective in a patient whose cardiac status was too precarious to undergo a long surgical reconstruction operation. With the VAC., the patient's wound decreased in size, and the VAC was thought to aid in local management of infection and improved granulation tissue.

Text D

Advice to give the patient before discharge.

- Help arrange the patient's aftercare, including home health care and instruction regarding wound management, social services to promote adjustment to lifestyle changes and financial concerns, and physical therapy sessions to help rebuild strength and promote the return to optimal physical health.
- The life-threatening nature of NF, scarring caused by the disease and in some cases the need for limb amputation can alter the patient's attitude and viewpoint, so be sure to take a holistic approach when dealing with the patient and family.

Remind the diabetic patient to

- control blood glucose levels, keeping the glycated haemoglobin (HbA1c) level to 7% or less.
- keep needles capped until use and not to reuse needles.
- clean the skin thoroughly before blood glucose testing or insulin injection, and to use alcohol pads to clean the area afterward.

Necrotizing fasciitis (NF): Questions

Questions 1-7

For each question **1-7** 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 drug treatment required? _____
2. Which part of the body can be affected? _____
3. The various ways calories can be introduced? _____
4. Who to contact to help the patient after they leave hospital? _____
5. What kind of dressing to use? _____
6. How long to give drug therapy to the patient _____
7. What advice to give the patient regarding _____

Questions 8-14

Complete each of the sentences. 8 to 14 with the word or short phrase from one of the texts. Each answer may include words, numbers, or both.

Patients at increased risk of tetanus:

8. Which two drugs can you use to treat the clostridium species of pathogen?

9. Which common metabolic condition may occur with NF?

10. What complication can a patient suffer from if NF is in treated quickly enough?

11. What procedure can you use with the wound of the patient cannot be operated on?

12. What should the patient be told to use to clean an injection site?

13. Which two drugs can be used if you can't use Vancomycin?

14. What kind of infection should you use tetracyclines for?

Question 15-20

Complete each of the sentences. 15to 20 with the word or short phrase from one of the texts.
Each answer may include words, numbers, or both.

15. The average proportion of patients who die as a result of contracting NF is-

16. Patients who have eaten _____ may be infected with Aeromonas hydrophilia.

17. Patients with Type 2 infection usually present with infected _____.

18. Type 1 NF is also known as _____.

19. The patient needs to be aware of the need to keep glycated haemoglobin levels lower than _____.

20. The patient will need a course of _____ to regain fitness levels after returning home.

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 question **1 to 6**, choose answer (A B or C) which you think fits best according to the text.

1. The policy document tells us that

- (A) stop dates aren't relevant in all circumstances.
- (B) anyone using EPMA can disregard the request of a stop date.
- (C) prescribers must know in advance of prescribing what the stop date should be

Prescribing stop dates.

Prescribers should write a review date or a stop date on the electronic prescribing system EPMA or the medicine chart for each antimicrobial agent prescribed. On the EPMA, there is a forced entry for stop dates on oral anti-microbials. There is not a forced stop date on EPMA for IV antimicrobial treatment. If the prescriber knows how long the course of IV should be, then the stop date can be filled in. If not known, then a review should be added to the additional information. Example, 'the review after 48 hours. If the prescriber decides treatment needs to continue beyond the stop date or course length indicated, then it is their responsibility to amend the chart. In critical care, it has been agreed that the routine use of review/dates on the charts is not always appropriate.

2. The guidelines inform us that personalised equipment for radiotherapy

- (A) is advisable for all patients.
- (B) improves precision during radiation.
- (C) needs to be tested at the first consultation.

Guidelines: Radiotherapy Simulation Planning Appointment

The initial appointment may also be referred to as the Simulation Appointment. During this appointment you will discuss your patient's medical history and treatment options, and agree on a radiotherapy treatment plan. The first step is usually to take a CT scan of the area requiring treatment. The patient will meet the radiation oncologist, their registrar and radiation therapist. A decision will be made regarding the best and most comfortable position for treatment, and this will be replicated daily for the duration of the treatment. Depending on the area of the body to be treated, personalised equipment such as a face mask may be used to stabilise the patient's position. This equipment helps keep the patient comfortable and still during the treatment. And makes the treatment more accurate.

3. The purpose of these instructions is to explain how to

- (A)** monitor an ECG reading.
- (B)** position electrodes correctly.
- (C)** handle an animal during an ECG procedure.

CT200CV Veterinarian Electrocardiograph User Manual

Animal connections

Good electrode connection is the most important factor in recording a high-quality ECG. By following a few basic steps, consistent, clean recordings can be achieved.

- 1.** Shave a patch on each forelimb of the animal at the contact site.
- 2.** Clean the electrode sites with an alcohol swab or sterilising agent.
- 3.** Attach clips to the ECG leads.
- 4.** Place a small amount of ECG electrode gel on the metal electrode of the limb strap or adapter clip.
- 5.** Pinch skin on animal and place clips on the shaved skin area of the animal being tested. The animal must be kept still.
- 6.** Check the LCD display for a constant heart reading.
- 7.** If there is no heart reading, you have a contact problem with one or more of the leads.
- 8.** Recheck the leads and reapply the clips to the shaven skin of the animal.

4. The group known as ‘impatient patients’ are more likely to continue with a course of prescribed medication if

- (A) their treatment can be completed over a reduced period of time.
- (B) it is possible to link their treatment with a financial advantage.
- (C) its short-term benefits are explained to them.

Medication adherence and impatient patients

A recent article addressed the behaviour of people who have a ‘taste for the present rather than the future’. It proposed that these so-called ‘impatient patients’ are unlikely to adhere to medications that require use over an extended period. The article proposes that, an ‘impatience genotype’ exists and that assessing these patients’ view of the future while stressing the immediate advantages of adherence may improve adherence rates more than emphasizing potentially distant complications. The authors suggest that rather than attempting to change the character of those who are ‘impatient’, it may be wise to ascertain the patient’s individual priorities, particularly as they relate to immediate gains. For example, while advising an ‘impatient’ patient with diabetes, stressing improvement in visual acuity rather than avoidance of retinopathy may result in greater medication adherence rates. Additionally, linking the cost of frequently changing prescription lenses when visual acuity fluctuates with glycaemic levels may sometimes provide the patient with an immediate financial motivation for improving adherence.

5. The memo reminds nursing staff to avoid

- (A) x-raying a patient unless pH readings exceed 5.5
- (B) the use of a particular method of testing pH levels.
- (C) reliance on ph testing in patients taking acid-inhibiting medication.

Checking the position of a nasogastric tube

It is essential to confirm the position of the tube in the stomach by one of the following

- Testing pH of aspirate: gastric placement is indicated by a pH of less than 4, but may increase between pH 4-6 if the patient is receiving acid-inhibiting drugs.
Blue litmus paper is insufficiently sensitive to adequately distinguish between levels of acidity of aspirate.
- X-rays: will only confirm position at the time the X-ray is carried out. The tube may have moved by the time the patient has returned to the ward. In the absence of a positive aspirate test, where pH readings are more than 5.5, or in a patient who is unconscious or in a ventilator, an X-ray must be obtained to confirm the initial position of the nasogastric tube.

6. This extract informs us that

- (A) the amount of oxytocin given will depend on how the patient reacts
- (B) the patient will go into labour as soon as oxytocin is administered.
- (C) the staff should inspect the oxytocin pump before use

Extract from guidelines: Oxytocin

1. Oxytocin dosage and administration.

Parenteral drug products should be inspected visually for particulate matter and discolouration prior to administration whenever solution and container permit. Dosage of Oxytocin is determined by the uterine response. The dosage information below is based upon various regimens and the indication in general use,

1.1 Induction or stimulation of Labour.

Intravenous infusion (drip method) is the only acceptable method of administration for the induction or stimulation of labour. Accurate control of the rate of infusion flow is essential. An infusion pump or other such device and frequent monitoring of strength of contractions and foetal heart rate are necessary for the safe administration of oxytocin for the induction or stimulation of labour. If uterine contractions become too powerful, the infusion can be abruptly stopped, and oxytocin stimulation of the uterine musculature will soon wane.

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: Phobia pills

An irrational fear, or phobia, can cause the heart to pound and the pulse to race. It can lead to a full-blown panic attack –and yet the sufferer is not in any real peril. All it takes is a glimpse of, for example, a spider’s web for the mind and body to race into panicked overdrive. These fears are difficult to conquer, largely because, although there are no treatment guidelines specifically about phobias, the traditional way of helping the sufferer is to expose them to the fear numerous times. Through the cumulative effect of these experiences, sufferers should eventually feel an increasing sense of control over their phobia. For some people, the process is too protracted, but there may be a short cut. Drugs that work to boost learning may help someone with a phobia to ‘detrain’ their brain, losing the fearful associations that fuel the panic.

The brain’s extraordinary ability to store new memories and forge associations is so well celebrated that its dark side is often disregarded. A feeling of contentment is easily evoked when we see a photo of loved ones, though the memory may sometimes be more idealized than exact. In the case of a phobia, however, a nasty experience with, say, spiders, that once triggered a panicked reaction, leads the feelings to resurge whenever the relevant cue is seen again. The current approach is exposure therapy, which uses a process called extinction learning. This involves people being gradually exposed to whatever triggers their phobia until they feel at ease with it. As the individual becomes more comfortable with each situation, the brain automatically creates a new memory –one that links the cue with reduced feelings of anxiety, rather than the sensations that mark the onset of a panic attack.

Unfortunately, while it is relatively easy to create a fear-based memory, expunging that fear is more complicated. Each exposure trial will involve a certain degree of distress in the patient, and although the process is carefully managed throughout to limit this, some psychotherapists have concluded that the treatment is unethical. Neuroscientists have been looking for new ways to speed up extinction learning for that same reason.

One such avenue is the use of ‘cognitive enhancers’ such as a drug called D-cycloserine or DCS. DCS slots into part of the brain’s ‘NMDA receptor’ and seems to modulate the neurons’ ability to adjust their signaling in response to events. This tuning of a neuron’s firing is thought to be one of the key ways the brain stores memories, and, at very low doses, DCS appears to boost that process, improving our ability to learn. In 2004, a team from Emory University in Atlanta, USA, tested whether DCS could also help people with phobia. A pilot trial was conducted on 28 people undergoing specific exposure therapy for acrophobia—a fear of heights. Results showed that those given a small amount of DCS alongside their regular therapy were able to reduce their phobia to a greater extent than those given a placebo. Since then, other groups have replicated the finding in further trials.

For people undergoing exposure therapy, achieving just one of the steps on the long journey to overcoming their fears requires considerable perseverance, says Cristian Sirbu, a behavioral scientist and psychologist. Thanks to improvement being so slow, patients –often already anxious –tend to feel they have failed. But Sirbu thinks that DCS may make it possible to tackle the problem in a single 3-hour session, which is enough for the patient to make real headway and to leave with a feeling of satisfaction. However, some people have misgivings about this approach, claiming that as it doesn't directly undo the fearful response which is deep-seated in the memory, there is a very real risk of relapse.

Rather than simply attempting to overlay the fearful associations with new ones, Merel Kindt at the university of Amsterdam is instead trying to alter the associations at source. Kindt's studies into anxiety disorders are based on the idea that memories are not only vulnerable to alteration when they're first laid down, but of key importance, also at later retrieval. This allows for memories to be 'updated', and these amended memories are re-consolidated by the effect of proteins which alter synaptic responses, thereby maintaining the strength of feeling associated with the original memory. Kindt's team has produced encouraging results with arachnophobia patients by giving them propranolol, a well-known and well-tolerated, beta-blocker drug, while they looked at spiders. This blocked the effects of norepinephrine in the brain, disrupting the way the memory was put back into storage after being retrieved, as part of the process of reconsolidation. Participants reported that while they still don't like spiders, they were able to approach them. Kindt reports that the benefit was still there three months after the test ended.

TEXT 1: Questions 7-14

7. In the first paragraph, the writer says that conventional management of phobias can be problematic because of

- (A) the lasting psychological effects of the treatment
- (B) the time required to identify the cause of the phobia
- (C) the limited choice of therapies available to professionals
- (D) the need for the phobia to be confronted repeatedly over time

8. In the second paragraph, the writer uses the phrase '**dark side**' to reinforce the idea that

- (A) memories of agreeable events tend to be inaccurate
- (B) positive memories can be negatively distorted over time
- (C) unhappy memories are often more detailed than happy ones
- (D) unpleasant memories are aroused in response to certain prompts

9. In the second paragraph, extinction learning is explained as a process which

- (A) makes use of an innate function of the brain
- (B) encourages patients to analyse their particular fears
- (C) show patients how to react when having a panic attack
- (D) focuses on a previously little-understood part of the brain.

10. What does the phrase '**for that same reason**' refer to?

- (A) the anxiety that patients feel during therapy
- (B) complaints from patients who feel unsupported
- (C) the conflicting ethical concerns of neuroscientists
- (D) psychotherapists who take on unsuitable patients.

11. In the fourth paragraph we learned that the drug called DCS

- (A) is unsafe to use except in small quantities
- (B) helps to control only certain types of phobias
- (C) affects how neurons in the brain react to stimuli
- (D) increases the emotional impact of certain events

12. In the fifth paragraph, some critics believe that one drawback of using DCS is that

- (A) its benefits are likely to be of limited duration
- (B) it is only helpful for certain types of personality
- (C) few patients are likely to complete the course of treatment
- (D) patients feel discouraged by their apparent lack of progress.

13. In the final paragraph we learn that Kindt's studies into anxiety disorders focused on how

- (A) proteins can affect memory retrieval
- (B) memories are superimposed on each other
- (C) negative memories can be reduced in frequency
- (D) the emotional force of a memory is naturally retained

14. The writer suggests that propranolol may

- (A) not offer a permanent solution for patients' phobias
- (B) increase patients' tolerance of key triggers
- (C) produce some beneficial side-effects
- (D) be inappropriate for certain phobias

Text 2 : Challenging medical thinking on placebos

Dr Damien Finniss, Associate professor at Sydney University's Pain management and Research Institute, was previously a physiotherapist. He regularly treated football players during training sessions using therapeutic ultrasound. 'One particular session', Finniss explains 'I treated five or six athletes. I'd treat them for five or ten minutes and they'd say. "I feel much better" and run back onto the field. But at the end of the session, I realised the ultrasound wasn't on. 'It was a light bulb moment that set Finniss on the path to becoming a leading researcher on the placebo effect.

Used to treat depression, psoriasis and Parkinson's, to name but a few, placebos have an image problem among medics. For years, the thinking has been that a placebo is useless unless the doctor convinces the patient that it's a genuine treatment- problematic for a profession that promotes informed consent. However, a new study casts doubt on this assumption and, along with a swathe of research showing some remarkable results with placebos, raises questions about whether they should now enter the mainstream as legitimate prescription items. The study examined five trials in which participants were told they were getting a placebo, and the conclusion was that doing so honestly can work.

'If the evidence is there, I don't see the harm in openly administering a placebo,' says Ben Colagiuri, a researcher at the University of Sydney. Colagiuri recently published a meta-analysis of thirteen studies which concluded the Placebo sleeping pills, whose genuine counterparts notch up nearly three million prescriptions in Australia annually, significantly improve sleep quality. The use of placebos could therefore reduce medical cost and the burden of disease in terms of adverse reactions.

But the placebo effect isn't just about fake treatments. It's about raising patients' expectations of a positive result; something which also occurs with real drugs. Finniss cities the 'open-hidden' effect, whereby an analgesic can be twice as effective if the patient knows they're getting it' compared to receiving it unknowingly. 'Treatment is always part medical and part ritual,' says Finniss. This includes the austere consulting room and even the doctor's clothing. But behind the performance of healing is some strong science. Simply believing an analgesic will work activates the same brain regions as the genuine drug. 'Part of the outcome of what we do is the way we interact with patients,' says Finniss.

That interaction is also the focus of Colagiuri's research. He is looking into the 'nocebo' effect, when a patient's pessimism about a treatment becomes self-fulfilling. 'If you give a placebo, and warn only 50% of the patients about side effects, those you warn report more side effects,' says Colagiuri. He is aiming to reverse that by exploiting the psychology of food packaging. Products are labelled 98% fat free rather than 2% fat because positive reference to the word 'fat' puts consumers off. Colagiuri is deploying similar tactics. A drug with a 30% chance of causing a side effect can be reframed as having a 70% chance of not causing it. 'You're giving the same information, but framing it a way that minimises negative expectations,' says Colagiuri.

There is also a body of research showing that a placebo can produce a genuine biological response that could affect the disease process itself. It can be traced back to a study from the 1970s, when psychologist Robert Ader was trying to condition taste aversion in rats. He gave them a saccharine drink whilst simultaneously injecting Cytoxan, an immune-suppressant which causes nausea. The rats learned to hate the drink due to the nausea. But as Ader continued giving it to them, without Cytoxan, they began to die from infection. Their immune system had ‘learned’ to fail by repeated pairing of the drink with Cytoxan. Professor Andrea Evers of Leiden University is running a study that capitalises on this conditioning effect and may benefit patients with rheumatoid arthritis, which causes the immune system to attack the joints. Evers’ patients are given the immunosuppressant methotrexate, but instead of always receiving the same dose, they get a higher dose followed by a lower one. The theory is that the higher dose will cause the body to link the medication with a damped-down immune system. The lower dose will then work because the body has ‘learned’ to curb immunity as a placebo response to taking the drug. Evers hopes it will mean effective drug regimes that use lower doses with fewer side effects.

The medical profession, however, remains less than enthusiastic about placebos. ‘I’m one of two researchers in the country who speak on placebos, and I’ve been invited to lecture at just one university,’ says Finniess. According to Charlotte Bleasdale, a philosopher of science, this antipathy may go to the core of what it means to be a doctor. ‘Medical education is largely about biomedical facts. ‘Softer’ sciences, such as Psychology, get marginalised because it is the hard stuff that’s associated with that it meant to be a doctor. ‘The result,’ says Bleasdale, ‘is a large placebo-shaped hole in the medical curriculum. ‘There’s a great deal of medical illiteracy about the placebo effect... it’s the science behind the art of medicine. Doctors need training in that.’

Text 2: Question 15-22

15. A football training session sparked Dr Finniss' interest in the placebo effect because
- (A) he saw for himself how it could work in practice
 - (B) he took the opportunity to try out a theory about it
 - (C) he made a discovery about how it works with groups
 - (D) he realised he was more interested in research than treatment
16. The writer suggests that the doctors should be more willing to prescribe placebos now because
- (A) research indicate that they are effective even without deceit
 - (B) recent studies are more reliable than those conducted in the past
 - (C) they have been accepted as a treatment by many in the profession
 - (D) they have been shown to relieve symptoms in a wide range of conditions
17. What is suggested about sleeping pills by the use of the verb 'notch up'?
- (A) they may have negative results
 - (B) they could easily be replaced
 - (C) they are extremely effective
 - (D) they are very widely used
18. What point does the writer make in the fourth paragraph?
- (A) The way a treatment is presented is significant even if it is a placebo.
 - (B) The method by which a drug is administered is more important than its content.
 - (C) The theatrical side of medicine should not be allowed to detract from the science.
 - (D) The outcome of a placebo treatment is affected by whether the doctor believes in it.

19. In researching side effects, Colagiuri aims to

- (A) discover whether placebos can cause them
- (B) reduce the number of people who experience them
- (C) make information about them more accessible to patients
- (D) investigate whether pessimistic patients are more likely to suffer from them.

20. What does the word 'it' in the sixth paragraph refer to?

- (A) a placebo treatment
- (B) the disease process itself
- (C) a growing body of research
- (D) a genuine biological response

21. What does the writer tell us about Ader's and Evers' studies?

- (A) Both involve gradually reducing the dosage of a drug.
- (B) Evers is exploiting a response which Ader discovered by chance.
- (C) Both examine the side effects caused by immunosuppressant drugs.
- (D) Evers is investigating whether the immune system reacts to placebos as Ader's rats did.

22. According to Charlotte Blease, placebos are omitted from medical training because

- (A) there are so many practical subjects which need to be covered
- (B) those who train doctors do not believe that they work
- (C) they can be administered without specialist training
- (D) their effect is more psychological than physical.

END OF READING TEST

THIS BOOKLET WILL BE COLLECTED