

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.

1. Technique overview – how to do this
2. **How to find answer quickly?**
3. Practice test (it's from 2.0 tests) – focus on finding it QUICKLY

OVERVIEW OF TECHNIQUE

STEP 1: analyse

30

Text A

Neurological features (NF) is a serious, life-threatening central and focal infection that develops in the skull and perineur, the abdominal wall, or the extremities. The infection progresses rapidly and usually death 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 (Gram-negative)	Clasp and facultative anaerobes	Trunk and perineur	Diabetes, malnutrition
Type 2 (Staphylococcal)	Staphylococcus aureus	Limbs	
Type 3	Clostridium species Gram-negative bacteria Hepatitis virus Aerobic hydrophobic	Limbs, trunk and perineur	Trauma Surgical Contaminated (for Peroneal)
Type 4	Candida spp. Zygomycetes	Limbs, trunk, perineur	Immunosuppression

Text B

Antibiotic treatment for NF

Type 1

- Initial treatment includes ampicillin or a penicillin-subactam 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-subactam, ciprofloxacin, levofloxacin, ticarcillin-clavulanic acid, third or fourth generation cephalosporins, or carbapenems are used, and at a higher dosage.

Type 2

- First or second generation cephalosporins are used for the coverage of methicillin-sensitive Staphylococcus aureus (MSSA).
- MSSA 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 with clindamycin and penicillin, which kill the Clostridium species.
- If virus infection is suspected, the early use of intravenous (including intrathecal and intracisternal) and third generation cephalosporins is crucial for the survival of the patient, since these antibiotics have been demonstrated to be the mortality rate drastically.

Type 4

- Can be treated with antifungal or antifolate, but the results of this treatment are generally disappointing.

Antibiotics should be administered for 4-6 weeks 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 the patient's survival. This involves fluid resuscitation, cardiac monitoring, aggressive airway care and mechanical ventilation support. Patients with NF are at a high risk of developing acute respiratory distress syndrome (ARDS). The use of a diaphragm can help to reduce the risk of ARDS. Patients with NF should be managed with a diaphragm and a nasogastric tube, jugular line, and arterial hypotension. This should be begun 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, prothrombin time, blood urea nitrogen, and electrolytes 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 faster healing. Advanced wound dressings may lead to healing or prepare the wound bed for grafting. A healthy wound bed increases the chance of epithelialization and graft take. Vacuum-assisted closure (VAC) was recently reported to be effective in a patient whose cardiac status was too precarious to undergo any life-saving surgery. VAC was used to debride the wound and improve granulation tissue.

Text D

Actions to give the patient further discharge planning home health care and instruction regarding wound management, social services, adaptive equipment to lifestyle changes and financial concerns, and physical therapists 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 worldview, 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 applied and use and to reuse needles.
- clean the skin thoroughly before blood glucose testing or insulin injections, and to use alcohol pads to clean the area afterward.

30

30

30

STEP 2: answer the 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 parts 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 needle use?

Tells the Answer

Tells us WHERE in the text

CATEGORY

Questions 8-14

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

KEY WORD

Patients at increased risk of tetanus:

8 With two drugs, you use to treat the clostridium species of pathogen?

- 10 What complication can a patient suffer from if NF isn't treated quickly enough?
- 11 What procedure can you use with a wound if the patient can't be operated on?

FINDING ANSWERS QUICKLY

Key points:

- **Main idea: do this well**
- **Keywords & categories**
- **Using medical knowledge**

MAIN IDEA OF TEXT:

How do I find it?

1. Repeated words
2. Headings*
3. Read first sentence
4. **Thematic** words

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.

KEYWORDS & CATEGORIES + MEDICAL KNOWLEDGE

CATEGORY

Key word must be unique (not repeated)

10 What **complication** can a patient suffer from if NF isn't treated **quickly** enough?

CATEGORY (probably diabetes)

1

2

9 Which **common** **metabolic** **condition** may occur with 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 anaerobes	Trunk and perineum	Diabetes mellitus
Type 2 (monomicrobial)	Beta-hemolytic streptococcus A	Limbs	
Type 3	<i>Clostridium</i> species Gram-negative bacteria <i>Vibrios</i> spp. <i>Aeromonas hydrophila</i>	Limbs, trunk and perineum	Trauma Seafood consumption (for <i>Aeromonas</i>)
Type 4	<i>Candida</i> spp. Zygomycetes	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 with 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 fluoroconazoles, 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 dressings 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 improve 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.

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 parts 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 needle use? _____

Questions 8-14

Complete each of the sentences, 8-14, 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:

- 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 isn't treated quickly enough?

- 11 What procedure can you use with a wound if the patient can't 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?

Questions 15-20

Answer each of the questions, 15-20, with a 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**