Protist diseases

4.3.1.5 · Infection and response · revision notes

Malaria is the protist disease in the specification. You need to know that it is caused by a protist, that mosquitoes are the vector, its main symptom, and how its spread is controlled by targeting mosquitoes.

Key facts

- Malaria is caused by a protist
- Symptom: recurrent episodes of fever; can be fatal
- Control: stop mosquitoes breeding (drain standing water); kill them with insecticides
- Vector = mosquito (carries the protist from person to person)
- The protist's life cycle includes the mosquito
- Control: mosquito nets to avoid being bitten

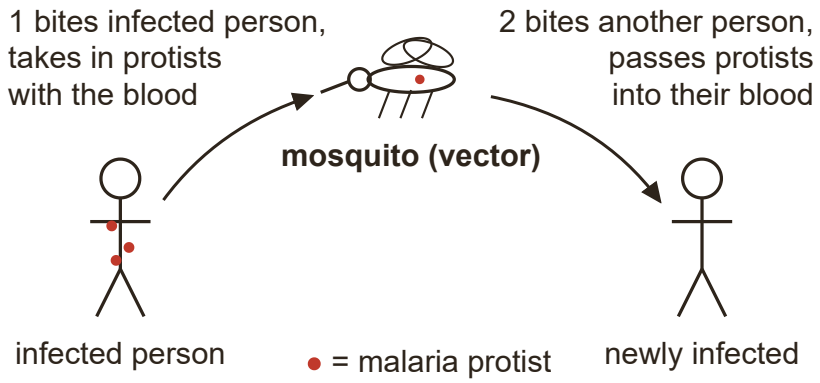
Notes

Malaria and protists

- The pathogens that cause malaria are **protists** (single-celled organisms).
- Malaria causes **recurrent episodes of fever**: the fever goes away and then comes back again and again.
- Malaria can be **fatal**.

The mosquito vector

- The malarial protist has a **life cycle** that includes the **mosquito**.
- A mosquito that bites an infected person takes in the protist with the blood. When it later bites another person, it passes the protist into that person's blood.
- The mosquito is a **vector**: it carries the pathogen from one person to another.



The mosquito carries the protist from one person to the next.

- Malaria is not spread by touching an infected person or through the air.

Controlling the spread

- Prevent mosquitoes **breeding**: mosquitoes lay their eggs in still water, so drain or treat areas of standing water, e.g. ponds and old containers.
- Kill adult mosquitoes with **insecticides**, e.g. sprayed inside homes.
- Use **mosquito nets** over beds (often treated with insecticide) to avoid being bitten at night.
- Each method means fewer mosquitoes or fewer bites, so the protist is passed to fewer people.

How to answer each type of question

Recall: pathogen, vector and symptom 1 mark each **Grade 3**

1. Pathogen = protist; vector = mosquito.
2. For the symptom, say that the fever is recurrent.

Example. (a) What type of pathogen causes malaria?
(b) Name the animal that spreads malaria.
(c) Give the main symptom of malaria.

Model answer.

(a) A protist (1)
(b) Mosquito (1)
(c) Recurrent episodes of fever (1)

Explain how a control method reduces spread 2 marks **Grade 5**

1. Say what the method does to mosquitoes: fewer mosquitoes or fewer bites.
2. Link it to the protist: it is not passed into people's blood, so fewer people are infected.

Example. Explain how sleeping under a mosquito net reduces the spread of malaria.

Model answer. The net stops mosquitoes biting the person at night (1). So the protist is not passed into the person's blood, and mosquitoes cannot pick up the protist from them if they are already infected (1).

Data: effect of a control measure

3 to 4 marks | Grade 7

1. Percentage decrease = decrease ÷ original value × 100.
2. Explain the result using the mosquito's life cycle or feeding.
3. Finish with fewer people infected by the protist.

Example. In a village, the number of cases of malaria fell from 320 per year to 72 per year after the ponds near the houses were drained.
(a) Calculate the percentage decrease in the number of cases.
(b) Explain why draining the ponds reduced the number of cases.

Model answer.

(a) 320 − 72 = 248 (1); 248 ÷ 320 × 100 = 77.5% (1)

(b) Mosquitoes lay their eggs / breed in still water, so there were fewer mosquitoes (1). So fewer people were bitten, and fewer protists were carried from infected people to others (1).

Don’t lose marks

- Saying malaria is caused by the mosquito, or by a virus or a bacterium. It is caused by a protist; the mosquito carries it.
- Saying malaria spreads directly from person to person, e.g. by coughing or touching.
- Writing 'kill the mosquitoes' without explaining why it helps: fewer mosquitoes means fewer bites, so fewer people are infected.
- Writing just 'fever' when the question wants the pattern: the fever is recurrent (it keeps coming back).

More tips

Memory tricks

- Malaria = P and M: a Protist carried by a Mosquito.
- Break the chain: fewer mosquitoes (stop them breeding) or fewer bites (nets) = fewer infections.
- The mosquito is the vector; the protist is the pathogen. Don't swap them.

Exam technique

- Always name the vector and say what it does: it carries the protist from an infected person to another person.
- Explanation marks come from the chain: method → fewer mosquitoes or fewer bites → fewer people infected.
- In data questions, quote numbers and use percentage change where the question asks you to compare.

What each grade needs

What you need to be able to do, from the first marks up to the top grade.

Grade 3 **Name a disease caused by a protist**
Malaria is caused by a single-celled protist.

Grade 4

Describe the main symptom of malaria

Recurrent episodes of fever (the fever keeps coming back); malaria can be fatal.

Grade 4

Identify the vector of malaria

Mosquitoes carry the protist and pass it to people when they bite them.

Grade 5

Describe how the spread of malaria is controlled

Stop mosquitoes breeding, and use mosquito nets to avoid being bitten.

Grade 5

Explain how each control method reduces spread

Fewer mosquitoes, or fewer bites, means the protist is passed to fewer people.

Grade 7

Explain why controlling mosquitoes controls malaria

The protist's life cycle includes the mosquito, so it is normally passed between people only by mosquito bites.

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