

## **1 Immune system and CD4 count**

### **Answers**

#### **1. What does AIDS stand for?**

Acquired immune deficiency syndrome

#### **2. What is a CD4 T cell?**

A CD4 cell is a white blood cell (lymphocyte) that signals CD8 cells to destroy a virus. HIV uses CD4 cells as factories to reproduce in.

#### **3. What is a CD8 T cell?**

A CD8 cell is a white blood cell (lymphocyte) that kills cells that are infected with viruses (eg HIV).

#### **4. What is the normal CD4 count for an HIV-negative adult?**

The 'normal' range for CD4 count in an HIV-negative adult is between 600 and 1600.

#### **5. Give another name for a CD4 and for a CD8 cell**

CD4 cell: helper cell, a CD4<sup>+</sup> T-lymphocyte, CD4<sup>+</sup> T-cell, and sometimes just T4 cell.

CD8 cell: killer cell.

#### **6. What is a CD4% and when is it used?**

CD4% is the percentage of total lymphocytes that are CD4 cells.

It is used as a more stable indication of whether there has been a change in the immune system. Children are monitored using CD4%.

#### **7. What is the difference between cellular and humoral immunity? Which kind of immunity does the body use to fight HIV?**

Cellular immunity is based on CD4 and CD8 responses. Humoral immunity is based on antibodies. Cellular immunity fights HIV.

#### **8. What is a surrogate marker?**

A surrogate marker is an indirect measure for something else that cannot be easily measured directly.

In HIV, CD4 count is a surrogate marker for disease progression.

**9. When should you have a CD4 count done? Describe at least two circumstances.**

US and UK treatment guidelines recommend a CD4 tests on diagnosis, and then every three months (whether or not on treatment).

If a test produces an unexpectedly high or low results, it should be repeated.

In countries with limited access to CD4 tests they are performed less frequently – perhaps every 6 months.

**10. At what CD4 count is it recommended you start HIV treatment?**

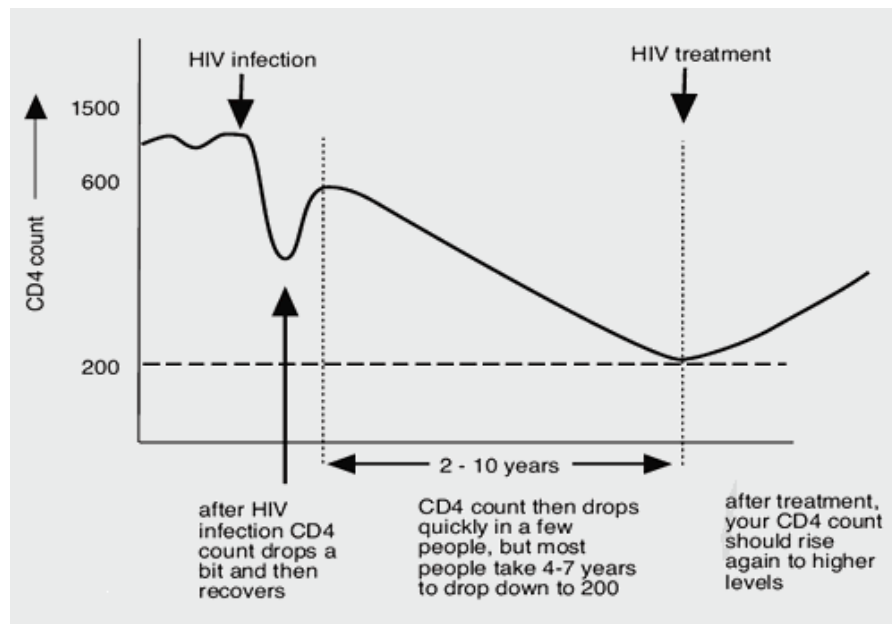
Some guidelines (WHO, UK) recommend starting treatment before your CD4 count falls below 200. Others (US) recommend starting before 350.

**11. Describe what happens to your CD4 count:**

- at the time of HIV infection
- in early infection
- in long-term infection

A few weeks after the infection, your CD4 count usually falls. Then the immune system fights back and the count rises again, but not to the level it was before HIV infection. From then on the CD4 count goes down gradually. It usually takes 2 to 10 years to drop to 200.

**12. Draw a graph to show what happens to your CD4 count from the time of infection until the time you need to start treatment.**



**13. List opportunistic infections that are more likely when your CD4 count falls below:**

- 300
- 200
- 100
- 50

The following opportunistic infections become more common below these CD4 levels:

- 300 – diarrhoea from microsporidia and cryptosporidia, skin problems, candida (thrush), dry skin, etc.
- 200 – PCP (pneumonia) and chest infections, toxoplasmosis (a parasitic infection commonly causes brain lesions).
- 100 – MAI/MAC (bacterial infection similar to TB)
- 50 – CMV (cytomegalovirus, a viral infection that can cause permanent vision loss or blindness).

**14. What is the main difference between CD4 counts for adults and children?**

Children have much higher CD4 counts than adults. Babies have higher CD4 counts than children. Over time and as the people age their CD4 count drops gradually.

**15. What is an antigen?**

Antigen is the term for infectious material produced by a virus or bacteria.

**16. What is an antibody?**

Antibodies are cells in the immune system that recognise antigens.