

GCSE Biology A (Gateway)

J247/04 Biology A B4-B6 and B7 (Higher Tier)

Question Set: Section B Question 21

1 Huntington's disease is a genetic condition. It is caused by a **dominant allele**.

(a) Explain what is meant by the term dominant allele.

An allele that always expresses itself to show its characteristic in phenotype [2]

(b)* The symptoms of Huntington's disease usually appear after the age of 40. There is no cure and people with the disease usually die after 10–15 years.

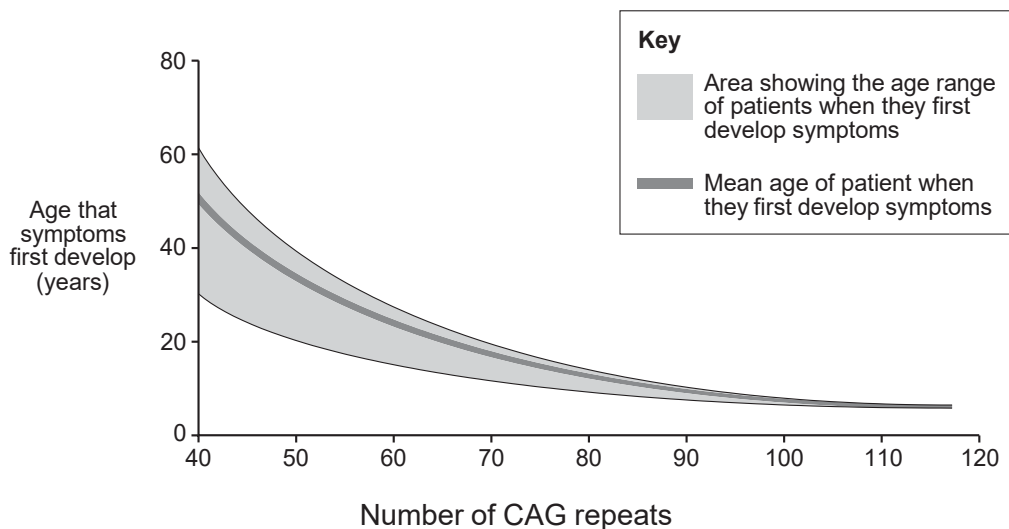
Scientists now know that there are a number of different forms of the allele that causes Huntington's disease. The allele has a sequence of three bases, CAG, that repeats many times. The number of repeats varies between patients.

Patients can be tested to see if they have the allele and how many repeats it has.

Doctors have studied many patients to see:

- The number of CAG repeats a patient has
- The age that the patient starts to show symptoms of the disease.

The results are shown on the graph.



Discuss how useful the gene test and the graph are for people who have a history of Huntington's disease in their family.

Gene test - useful to check for the presence of that allele as it is probable to be inherited the allele down the generation if they had the disease
- earlier detection of disease before symptoms to allow patients to plan ahead [6]

Graph - can predict the time of symptom development & predict how long left so can plan ahead & can give more certainty when symptoms appear spontaneously

- (c) A new study is giving hope for a treatment for Huntington's disease.

Doctors gave patients an injection of a drug that blocks the action of mRNA that is produced by the Huntington allele.

Explain how this drug could prevent the symptoms of Huntington's disease.

It stops replication of DNA so that the allele cannot form, as CAG triplet not present [2]
Stops translation of mRNA so prevents it attaching to ribosomes

Total Marks for Question Set 21: 10

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