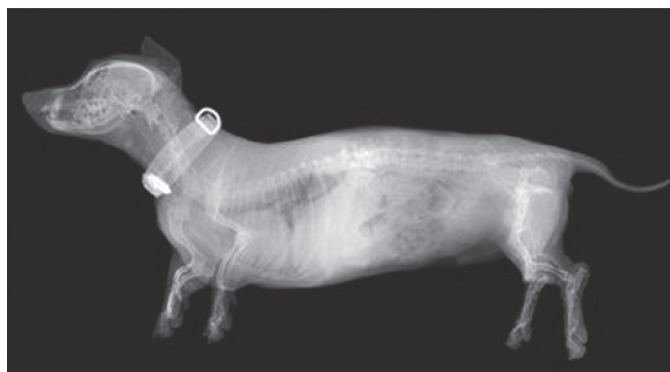


- 6 The photograph below shows an X-ray of a dachshund. The dachshund is a breed of dog that is at higher risk of paralysis due to spinal injury.

Scientists have successfully used stem cells to reverse this paralysis.



Magnification $\times 0.02$

- (a) Suggest why stem cells can be used to reverse this paralysis.

(2)

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- (b) The trial experiment was carried out on a dog that was paralysed due to a spinal injury and was unable to use its back legs.

The scientists extracted stem cells from the lining of the dog's nose. These cells were cultured for one month to increase their numbers. The stem cells were then injected into the injury site of this dog.

Suggest why stem cells were taken from this dog and not from another dog.

(2)

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- (c) A further investigation was carried out on 34 dogs with spinal injuries. Some had stem cells injected into the site of the spinal injury. The others were injected with a fluid containing no stem cells. This fluid is called a neutral fluid.

Neither the scientists nor the owners knew which dogs had been given stem cells and which had been given the neutral fluid.

The dogs that were given stem cells recovered the use of their back legs.

- (i) Explain the reason for giving some of the dogs a neutral fluid instead of stem cells.

(2)

- (ii) Suggest why neither the scientists nor the owners knew which dogs had been given stem cells and which had been given the neutral fluid.

(1)

(Total for Question 6 = 7 marks)

