

1 Read the information about stem cells.

Stem cells are used to treat some human diseases. Stem cells can be collected from early embryos. These stem cells have not begun to differentiate, so they could be used to produce any kind of cell, tissue or organ. The use of embryonic stem cells to treat human diseases is new and, for some diseases, trials on patients are happening now. Stem cells can also be collected from adult bone marrow. The operation is simple but may be painful. Stem cells in bone marrow mainly differentiate to form blood cells. These stem cells have been used successfully for many years to treat some kinds of blood disease. Recently there have been trials of other types of stem cell from bone marrow. These stem cells are used to treat diseases such as heart disease.

Evaluate the use of stem cells from embryos or from adult bone marrow for treating human diseases.

You should give a conclusion to your evaluation.

any **four** from:

embryo stem cells – examples of pros

can treat a wide variety / lots of diseases / problems

many available / plentiful

using them better than wasting them

painless

cons

(possible) harm / death to embryo

(relatively) untested / unreliable / may not work

embryo can't be 'asked' / 'embryo rights' idea

adult bone marrow stem cells – examples of pros

no ethical issues (in collection) or permission given

quick recovery

(relatively) safe well tried / tested / know they work

Cons

Less variety of cells possible/more difficult to make any cell

'Evaluation' for this type of question is about looking at pros and cons. Remember you can't just copy out the relevant bits from the given information as pros and cons. Some older mark schemes allow that. But now, for a good evaluation include pros and cons for a variety of factors using more than just what is in the question.

Other points that might gain a mark are that the long term effects are not known.

(5 marks)