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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.

**[5 marks]**

Any five from:

embryonic stem cells - examples of pros

can treat a wide variety/lots of diseases

many available/spare from IVF

totipotent/can become more cell types

using them would be better than wasting them/would be discarded anyway

cons:

harm/death to embryo

unreliable/low success rate/become cancerous

embryo cannot give consent/unethical/'right to life'

adult bone marrow stem cells - examples of pros

no ethical issues

quick recovery

well tested/better success rate

easily obtained

cons: multipotent/limited range of cell types