

## I NEED TO KNOW ABOUT BONE MARROW AND CORD BLOOD

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### What is bone marrow?

Bone marrow is the production factory for our blood cells.

### Where is our bone marrow?

We have all seen a leg of lamb. The bone is very hard and made of calcium. The middle of the bone has a soft red centre called the bone marrow. Our bodies have bone marrow in all our large long bones, eg femur (thigh bone), and large flat bones, eg pelvis (hip bone).

### What does bone marrow do?

The main role of bone marrow is to make blood cells. Bone marrow houses “haemopoietic stem cells” (HSC) which multiply and produce “daughter” cells. These daughter cells multiply greatly and develop into our different blood cells, eg red cells, platelets and so on. These are stored in the bone marrow until they are fully mature and then released into the blood.

### Can HSC be found elsewhere in our body?

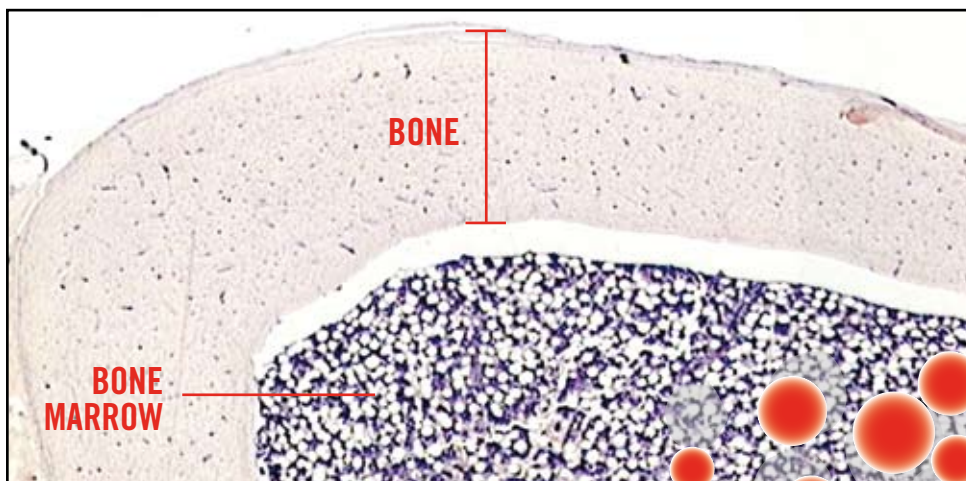
Yes. While haemopoietic stem cells generally live in the bone marrow, a very small number can be found in the adult blood. HSC are also found in the cord blood of newborn babies.

### What is cord blood?

The umbilical cord connects the developing baby (the fetus) to the placenta. The placenta helps the bone marrow by hosting HSC which produce some of the fetal blood cells. The umbilical cord carries fetal blood, together with some HSC.

### Are HSC useful for patients?

Obviously we all need enough HSC to make our blood cells. We would have low blood cell counts without them, which would lead to severe illness or death. Patients who have



**Above:** Bone cross section showing bone marrow.

Source: [http://medsci.indiana.edu/a215/virtualscope/docs/chap4\\_3.htm](http://medsci.indiana.edu/a215/virtualscope/docs/chap4_3.htm)

severe bone marrow disease may benefit from new HSC collected from a donor. Most commonly this occurs in a patient with leukaemia, a cancer of bone marrow and blood, who receives treatment which kills both leukaemia and normal bone marrow alike. These patients need a bone marrow replacement – a medical treatment called bone marrow transplantation or sometimes called stem cell transplantation.

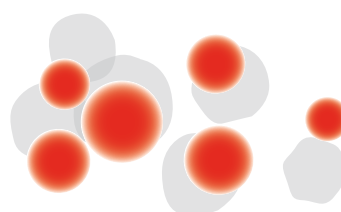
### How can HSC be collected from a donor?

HSC can be found in, and collected from, bone marrow, blood and cord blood.

- Bone marrow can be sucked out via a needle placed in the pelvic (hip) bone of a donor under general anaesthetic.
- To collect HSC from blood, the donor receives medications to increase the number of HSC in the blood. Apheresis is then used to collect the HSC.

## CELLTALK

Cord stem cells can develop not just into blood cells but cartilage, fat, muscle and nerve cells as well.



- A needle placed in the cord after delivery of the placenta can collect about 100 mL of blood. This is very rich in HSC.

### Do donors have any problems with the collection?

Bone marrow donors might have a sore hip as the medication used before apheresis collection often causes bone aches. Serious adverse effects are very rare. Because the cord has already been separated from the baby, there are no problems with cord collection.

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