



Donating stem cells

The three main sources of donated stem cells are:

- Adult tissues such as bone marrow
- Blood from the umbilical cord that separates mother and baby or the placenta
- Embryos and aborted fetuses

Stem cells from bone marrow are used to treat a variety of blood disorders. Donating bone marrow involves minor surgery to remove bone marrow from the pelvic region under general or local anaesthesia. It is also possible to collect bone marrow cells from blood. Although there are risks because of the anaesthesia and some pain or discomfort to the donor, there is a very low chance of longer term complications for the donor.

Until recently, umbilical cords and placenta were discarded after childbirth. It is now known that these tissues are a source of stem cells that can be used to treat blood disorders and potentially other types of diseases, even though there are fewer stem cells per volume than in bone marrow. Umbilical cord blood or placental donations do not put the mother or baby at risk. Before an expectant mother can donate her child's umbilical cord blood, she will need to discuss whether she is able to donate with her GP. The next step is to contact the cord blood bank. They will take a blood sample to check for infectious diseases and ask you to sign a consent form for the donation and to give them access to your medical history.

The UK Human Fertilisation and Embryology Authority (HFEA) will now allow preimplantation selection of IVF embryos based on whether the baby's cord blood is a match for an existing child with a disorder that can be treated with cord blood stem cells. The UK HFEA decides whether you will be able to select embryos for this type of treatment on a case-by-case basis. Umbilical cord blood stem cells may be stored to treat your baby and stored in private stem cell banks or be donated for non-directed use.

The HFEA now also allows spare embryos from IVF treatment to be used for research, testing and as a potential source of stem cells for therapeutic cloning. During IVF programmes, eggs removed from the mother are fertilised with her partner's or donor sperm. This triggers cell division and a tiny ball of stem cells — the embryo — is transplanted back into the mother's uterus before it reaches the 14-day stage. Generally, IVF yields spare embryos that are stored or unwanted. Unwanted embryos must be used before they are 14 days old, the legal limit in the UK for keeping human embryos outside the body. In 2001, the UK government passed laws allowing licensed research institutes to experiment on these embryos within the existing 14-day limit. This limit does not apply to stem cells extracted from aborted fetuses.

National registers and banks

In the UK there are three registries for bone marrow stem cells. These are the Anthony Nolan Trust, the Welsh Bone Marrow Donor Registry (WBMDR) and British Bone Marrow Registry.

Non-directed cord blood collection for the NHS Cord Blood Bank is undertaken at Northwick Park Hospital in Harrow, Barnet General Hospital in Barnet and The Luton and Dunstable Hospital NHS Trust in Luton. Other hospitals are likely to join this scheme in the future.