UMBILICAL CORD STEM CELL - SCIENCE

1.   Umbilical cord stem cells are stem cells collected from the umbilical cord at birth. Normally, the placenta and its contents are discarded after delivery. It has been found that stem cells can be collected from the umbilical cord before the placenta is discarded.

2.   Its current use is to repair the bone marrow after treatments for cancer, as it is thought that umbilical cord stem cells are mainly haematological precursor cells.

3.   Until now, stem cells drawn from umbilical cord blood have been reserved mostly for treating children. Because an umbilical cord contains only one-tenth as many stem cells as a marrow donation, it was believed there was too little tissue to reconstitute the immune defenses of an adult.

4.   However, new research shows that because the umbilical cord cells proliferate so rapidly, they can indeed be used to treat adults and may even replace bone marrow and other sources of stem cells. Moreover, cord blood transplantation "holds the promise of making it so everyone has a donor."

5.   Cord blood stem cells are collected by hospitals before placentas are discarded and so do not involve the controversy over use of stem cells from fetuses.

6.   Cord blood cells, stored frozen at public stem cell banks, offer other key advantages. They are immunologically "naive," unlike cells from adults, and are thus far less likely to trigger a common, life-threatening complication called graft-versus-host disease.

7.   Moreover, cells from newborns are unlikely to contain viruses, unlike most adults.

8.   The current research emphasis is on developing ways to make stem cells from cord blood multiply in the lab so there are more cells to transplant.

Prof Ng Soon Chye
Head
Department of Obstetrics & Gynaecology
Faculty of Medicine, NUS