



**babycell™**

*The Life Saving Cord Blood Bank*

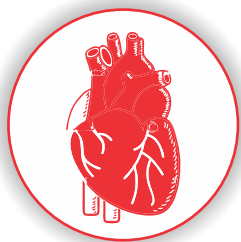
**Cord blood stem cells are making ground breaking progress in the treatment of:**



### **Traumatic Brain Injury**

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Caused due to external physical force, traumatic brain injury leads to impairment of cognitive abilities or physical functioning. Research shows that cord blood stem cells have the potential to initiate and maintain tissue repair in the brain.



### **Congenital Heart Disease**

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It is caused due to the incomplete or abnormal development of the foetus' heart during the first few weeks of pregnancy. It compromises with the heart's ability to pump oxygen to the various organs and tissues in the body. Cord blood stem cells have demonstrated excellent growth potential for tissue-engineered vascular grafts that could replace human heart defects.



### **Juvenile Diabetes**

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This type of Diabetes is most often diagnosed in children and is characterized by an inability of the pancreas to produce sufficient insulin, a hormone that helps regulate blood sugar levels. This is an 'autoimmune' disease. Studies and clinical trials have shown that cord blood stem therapy can reverse this condition and provide lasting improvements.

Preserved stem cells can be used to treat any family member with the confirmation of a simple blood test (HLA).

## Traumatic Brain Injury

Traumatic Brain Injury is a damage to the brain caused by an external physical force that may produce a diminished or altered state of consciousness, which results in an impairment of cognitive abilities or physical functioning. It can also result in the disturbance of behavioral or emotional functioning.



As per NIMHANS (National Institute of Mental Health & Neuro Science), it is estimated that **10 lac persons are injured, 2lac people die and nearly 10 lac require rehabilitation services** every year in India<sup>1</sup>.

Current treatments for brain injury include medication, psychotherapy, neuropsychological rehabilitation, surgery, or physical implants such as deep brain stimulation. Umbilical Cord Blood stem cell transplant is soon becoming one of the most effective treatments for Brain Injuries.

### Umbilical Cord Blood-Derived Stem Cells and Brain Repair

HUCB [Human Umbilical Cord Blood] is enriched with stem cells that have the potential to initiate and maintain tissue repair or replace damaged tissues. HUCB stem cells promote neural repair by delivering neural protection and secretion of neurotropic factors. In the preclinical studies the HUCB was applied for treatment of neurodegenerative diseases and for traumatic and ischemic brain damage. Furthermore, HUCB cells are easily available and less immunogenic compared to other sources for stem cell therapy such as bone marrow<sup>3</sup>.

### References:

1. [http://www.nimhans.kar.nic.in/epidemiology/doc/ep\\_ft25.pdf](http://www.nimhans.kar.nic.in/epidemiology/doc/ep_ft25.pdf)
2. <http://onlinelibrary.wiley.com/doi/10.1196/annals.1334.008/abstract;jsessionid=D74E980CD310E9E440322B1C26B393CF.f04t01?deniedAccessCustomisedMessage=&userIsAuthenticated=false>
3. <http://www.sciencedaily.com/releases/2013/05/130523101822.htm>
4. <http://www.mayo.edu/research/clinical-trials/cts-20089891>

## Congenital Heart Disease

Congenital Heart Disease [CHD] refers to abnormalities in the heart's structure that are present at birth. CHD often compromise the heart's ability to pump blood and to deliver oxygen to the tissues of the body. CHD are caused due to incomplete or abnormal development of the fetus' heart during the very early weeks of pregnancy.

Congenital heart defects are the most common type of birth defect. Approximately 8 out of every 1,000 newborns have congenital heart defects, which can range from mild to severe. According to a status report by AIIMS<sup>1</sup>, 10% of the present infant mortality in India may be accounted for by CHD. Every 15 minutes a baby is born with congenital heart disease.

Today, treatment for babies born with Congenital Heart disease involves three heart surgeries to redirect blood flow through the heart, or transplantation. The surgeries, designed to provide adequate blood flow in and out of the heart, allowing the body to receive the oxygen-rich blood it needs, are typically performed over the first few years of life

However, cord blood stem cells may have the most immediate benefit for children born with congenital heart defects. These findings offered a compelling reason why parents with a child diagnosed intrauterine with congenital defects should consider preserving their child's cord blood, since it may offer a treatment option in the future. These stem cells increase the volume and strength of the heart muscle to give it greater durability and power to pump blood throughout the body.

First FDA Approved Clinical trial in CHD using Umbilical Cord blood stem cells [AUTOLOGOUS]



Stem cells from newborn with Congenital Heart Disease will be collected from the umbilical cord following birth.

The cord blood will be sent to lab for processing, where the stem cells will be separated from the other cells in the blood.

The stem cells will then be frozen for preservation.

During baby's second surgery for Congenital Heart Disease- typically performed at 4 to 6 months of age- the stem cells will be injected into the heart muscle.

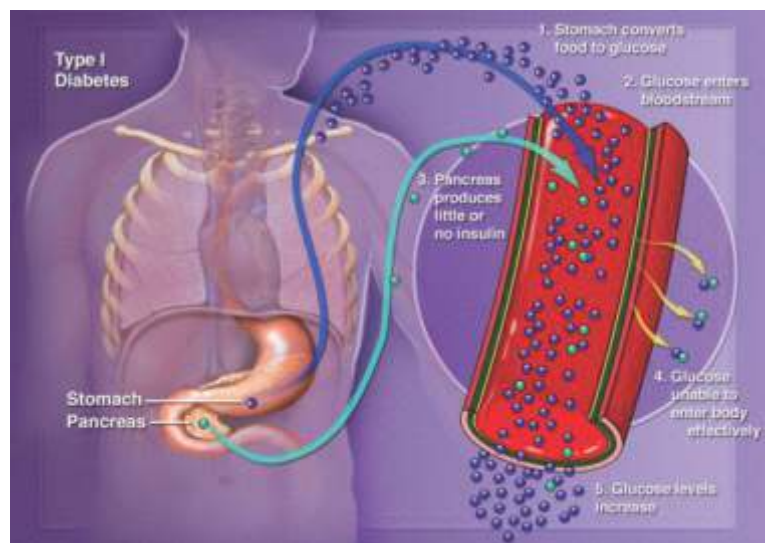
**References:**

1. <http://medind.nic.in/icb/t05/i7/icbt05i7p595.pdf>
2. Link to First FDA Approved Clinical trial in CHD using Umbilical Cord blood stem cells [AUTOLOGOUS]. <http://www.newswise.com/articles/mayo-clinic-first-in-us-to-test-stem-cells-in-pediatric-congenital-heart-disease-patients>

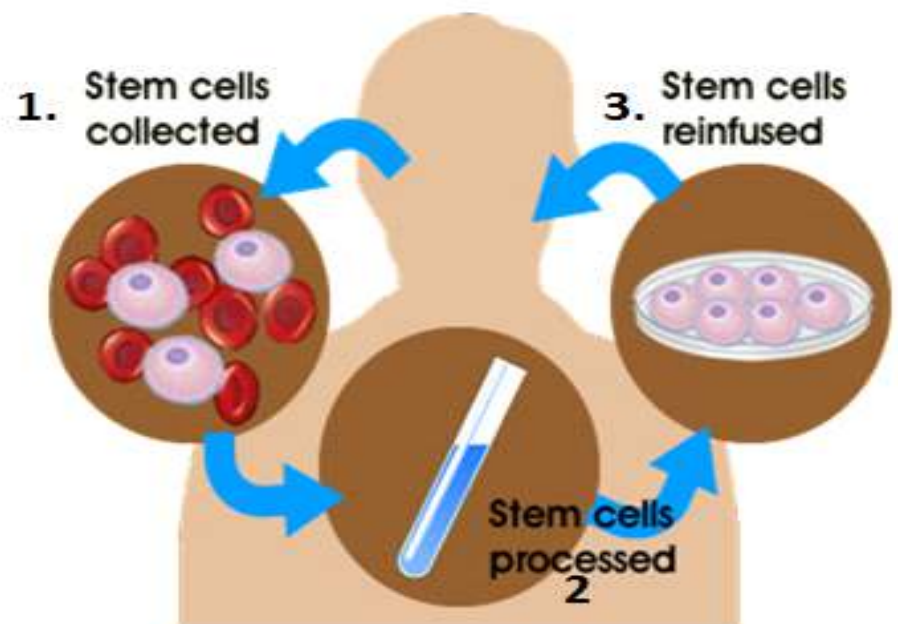
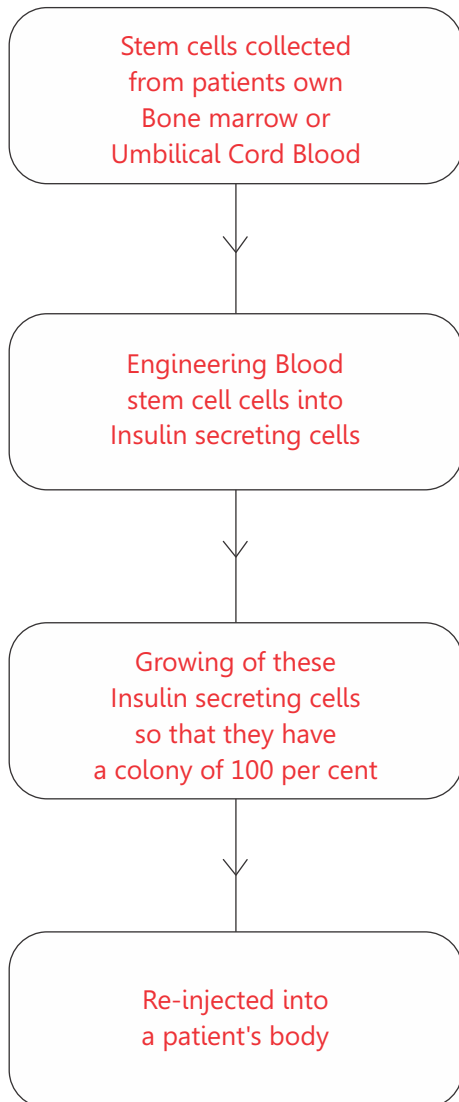
## Juvenile Diabetes

Type 1 diabetes occurs when the body's own immune system destroys the insulin-producing cells of the pancreas (called beta cells). This results in a complete deficiency of the insulin hormone. This type of diabetes usually diagnosed in children and young adults.

As per Indian Diabetic Foundation [IDA] every 8 seconds one individual dies of diabetes, in the same 8 seconds two develop the diabetes. Millions of people with type 1 diabetes depend on daily insulin injections to survive, this being the only option available to manage the disease.



The recent developments in HUCB gives hope for such patients. Patients own stem cells have been shown to generate insulin-producing  $\beta$  cells.



**References:**

1. Link to Cord Blood Therapies for Type 1 Diabetes at University of Florida: <http://jdrf.org/grant-center/jdrf-centers/jdrf-autoimmunity-center-consortium-acc/cord-blood-therapies-for-type-1-diabetes-at-university-of-florida/>