

**Commercializing and Marketing the Concept of Cord Blood Stem Cells Preservation  
through Public Private Partnership Model (PPP)**

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**Commercializing and Marketing the Concept of Cord Blood Stem Cells Preservation  
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**Abstract Problem Statement:** *The medical technology has transformed into a greater pinnacle and changed the way the diseases are diagnosed and treated. The recent innovation is preservation and the use of cord blood stem cells to cure incurable/difficult to cure diseases. The awareness is minimal and overshadowed with myths and misconceptions. **Approach:** A survey was conducted -to ascertain people's awareness and preparedness concerning Stem Cells Preservation; -formulate marketing strategies to diffuse the innovation and -devising unique PPP model. **Results:** the assessment unearthed various myths; cost, utility and trust factors were prominent. **Conclusions / Recommendations:** the diffusion of innovation requires marketing techniques to reach and persuade people. The PPP model provides infrastructure, technology, professional management, reduces medical expenditure and augments affordability.*

**Key words: Commercializing, Marketing, Public Private Partnership**

### **Introduction**

Medical Technology has reached greater heights; the paradigm shift has been witnessed in diagnosis and treatment of various diseases. The advanced inventions and innovations like, 4<sup>th</sup> generation cephalosporin, chemo therapy, CT Scans, Magnetic Resonance Imaging, Ultrasonography, electro encephalography, electro cardio graphs etc; have change the way the diseases are diagnosed and treated. Moreover the health care field nowadays is facing many challenging confrontations in the form of new, wild and infuriating diseases. The innovation of recent times is the use of the cord blood stem cells to cure incurable or difficult to cure diseases. The cord blood stem cells can be preserved and used at the times of adversities to have more predictable cure rates and reduce the people's huge spending on medical grounds. Umbilical cord blood is blood that remains in the placenta and in the attached umbilical cord after child birth. It contains valuable stem cells that can be used in a variety of medical treatments, such as regenerating healthy blood and immune cells after chemotherapy. Stem cells are the body's "master cells" because they are the building blocks of organ tissue, blood, and the immune system. Stem cells from bone marrow were first used to regenerate blood and immune cells for patients who had received chemotherapy for cancer. In the late 1980s, doctors started using cord blood stem cells to treat diseases that previously had been treated with bone marrow transplantation. Today, cord blood stem cells are successfully being used to save lives.

Cord blood contains hematopoietic<sup>1</sup> stem cells, progenitor cells which help in forming red blood cells(RBC's), white blood cells(WBC's), and platelets. Cord blood cells are currently used to treat blood and immune system related genetic diseases, cancers, and blood disorders. After a baby is born and the umbilical cord is cut, some blood remains in the blood vessels of the placenta and the portion of the umbilical cord that remains attached to it. After

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<sup>1</sup> Hematopoietic stem cells (HSCs) are the blood cells that give rise to all the other blood cells.

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birth, the baby no longer needs this extra blood. This blood is called placental blood or umbilical cord blood: "cord blood" for short. Cord blood contains all the normal elements of blood - red blood cells, white blood cells, platelets and plasma. But it is also rich in hematopoietic (blood-forming) stem cells, similar to those found in bone marrow. This is why cord blood can be used for transplantation as an alternative to bone marrow<sup>2</sup>. Cord blood is being used increasingly on an experimental basis as a source of stem cells, as an alternative to bone marrow. Most cord blood transplants have been performed in patients with blood and immune system diseases. Cord Blood transplants have also been performed for patients with genetic or metabolic diseases. More than 80 different diseases have been treated<sup>3</sup> to date with unrelated cord blood transplants: which includes *Cancers* like - Acute Leukemia, Chronic Leukemia, High-Risk Solid Tumors, Hodgkin & Non-Hodgkin Lymphoma, Myelodysplastic Syndrome, *Blood Disorders* like - Aplastic Anemia, eta Thalassemia, Diamond-Black fan Anemia, Fanconi Anemia, Sickle Cell Disease, *Immune Disorders* like - Chronic Granulomatous Disease, Histolytic Disorders, Leukocyte Adhesion Deficiency, Severe Combined Immunodeficiency Diseases, Wiskott-Aldrich Syndrome, *Metabolic Disorders* - Krabbe Disease, Hurler Syndrome, Metachromatic Leukodystrophy, Sanfilippo Syndrome

### **Cord blood stem cells collection**

Cord blood collection happens after the umbilical cord has been cut and is extracted from the fetal end of the cord, diverting up to 75 +/- 23 mL from the neonate. It is usually done within ten minutes of giving birth<sup>4</sup>. Additional stem cells may be collected from the placenta via Placenta Cord Banking. After the health care provider draws the cord blood from the placental end of the

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<sup>2</sup> [www.nationalcordbloodprogram.com](http://www.nationalcordbloodprogram.com) – national cord blood program – new York blood center U.S.A.

<sup>3</sup> [http://www.nationalcordbloodprogram.org/downloads/list\\_of\\_diseases.pdf](http://www.nationalcordbloodprogram.org/downloads/list_of_diseases.pdf) - List of different diseases treated with cord blood stem cells.

<sup>4</sup> "Banking Cord Blood is Health Investment". Retrieved August 19, 2011.

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umbilical cord, the placenta is couriered to the stem cell laboratory, where it is processed for additional stem cells. An adequate cord blood collection requires at least 75 mL in order to ensure that there will be enough cells to be used for transplantation. Before the cord blood<sup>5</sup> is stored for later use, it undergoes viral testing, including tests for HIV and Hepatitis B and C, and tissue typing (to determine HLA type). It will also be examined for nucleated cell count, cell viability, blood group antigen (ABO & Rh), molecule cluster (CD34), and bacterial and fungal growth.

### **Preservation**

After the collection, the cord blood unit is shipped to the lab and processed, and then cryopreserved. There are many ways to process a cord blood unit, and there are differing opinions on what is the best way. Some processing methods separate out the red blood cells and remove them, while others keep the red blood cells. However the unit is processed, a cryopreservant is added to the cord blood to allow the cells to survive the cryogenic process. After the unit is slowly cooled to  $-90^{\circ}\text{C}$ , it can then be added to a liquid nitrogen tank which will keep the cord blood unit frozen at  $-196^{\circ}\text{C}$ . The slow freezing process is important to keep the cells alive during the freezing process. The protocols used for the cryopreservation have largely been adapted from those originally designed for the bone marrow hematopoietic stem/progenitor cells. There is no consensus yet on optimal procedures for these cord blood cells, although many cryopreservation strategies suggest using dimethyl sulfoxide (DMSO), slow or controlled rate cooling, and rapid thawing.

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<sup>5</sup> [http://en.wikipedia.org/wiki/Cord\\_blood\\_bank#cite\\_note-Health-7](http://en.wikipedia.org/wiki/Cord_blood_bank#cite_note-Health-7)

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### **Advantages of cord blood stem cells**

Cord blood stem cells are currently used in the treatment of several life-threatening diseases, and play an important role in the treatment of blood and immune system related genetic diseases, cancers, and blood disorders. National Donor Marrow Program website<sup>6</sup> has the list of diseases successfully treated by cord blood stem cells. The first clinically documented use of cord blood stem cells was in the successful treatment of a six-year-old boy afflicted by Fanconi anemia in 1988. Since then, cord blood has become increasingly recognized as a source of stem cells that can be used in stem cell therapy. Recent studies have shown that cord blood has unique advantages over traditional bone marrow transplantation, particularly in children, and can be life-saving in rare cases where a suitable bone-marrow donor cannot be found. Approximately 50% of patients requiring a bone marrow transplant will not find a suitable donor within a critical period. In certain instances, there may be some medical issues around using one's own cord blood cells, as well as availability of cells, which will require treatments done using cells from another donor, with the vast majority being unrelated donors. However, studies have shown that cord blood stem cells can also be used for siblings and other members of your family who have a matching tissue type. Siblings have up to a 75% chance of compatibility, and the cord blood may even be a match for parents (50%) and grandparents.

1. Cord blood collection is easy and poses no medical risk to the mother or newborn baby.
2. Cord blood is collected in advance, tested and stored frozen, ready to use.
3. Cord blood transplants do not require a perfect match.

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<sup>6</sup> <http://www.cibmtr.org/pages/index.aspx> - CIBMTR - center for international blood and marrow transplant research.

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4. Cord blood transplants are associated with lower incidence of GvHD. (graft vs. host disease)<sup>7</sup>.
5. Cord Blood Transplants are associated with lower risk of viral infections

***Some of the Misconceptions and Facts about the Cord Blood Stem Cell Preservation***

*Misconception:* "Cord blood collection takes important blood away from my baby."

*Fact:* Cord blood collection is painless, easy, and safe for both mother and newborn. The cord blood is collected after your baby is born and the umbilical cord has been clamped and cut. The cord blood being collected is blood that would normally be discarded after birth. Your caregiver will not alter the normal birthing process in any way, except to collect your baby's cord blood. Cord blood collection can take place after a vaginal or C-section birth and collection can still be performed after delayed clamping.

*Misconception:* "The cord blood stem cells may not remain useful after long-term storage."

*Fact:* Based on published regulatory guidelines and current science involving cryogenic storage of cells, cord blood stem cells should remain useful indefinitely, so your family may be able to use the cells for diseases and injuries that occur decades from now.

*Misconception:* "The chances that a family with no history of cancer or disease will ever need their banked cord blood are so low that people shouldn't bother doing it." Families save their babies' cord blood stem cells for peace of mind because they don't want to take the chance of not banking when these stem cells may one day be lifesaving to someone in their family. Many families have no history of disease but recognize the current and future value of their newborns' cord blood stem cells as a resource for medical treatments.

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<sup>7</sup> Graft-versus-host disease (GVHD) is a common complication following an allergenic tissue transplant, Immune cells (white blood cells) in the tissue (the graft) recognize the recipient (the host) as "foreign". The transplanted immune cells then attack the host's body cells

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*Family History:* Family history is not a reliable indicator of need because most forms of leukemia (the most common reason for needing a stem cell transplant) are not hereditary, and the causes of many cancers and diseases are unknown. In fact, numerous serious diseases treatable with cord blood are not hereditary and occur without warning.

*Odds of Use:* Although no one can predict future illness or injury, published estimates of the odds of needing stem cells for current uses in transplant medicine are 1 in 217<sup>8</sup>. Based on current data, cord blood stem cells should remain useful indefinitely, so your family may be able to use the cells for diseases and injuries that occur decades from now. *Transplant Medicine:* In transplant medicine, a patient generally will undergo chemotherapy to treat the underlying disease and then receive an infusion of cord blood stem cells to create a new healthy blood and immune system. In fact, cord blood stem cells have been used to treat many life-threatening diseases, such as leukemia and other cancers. *Regenerative Medicine:* New research with cord blood focuses on regenerative medicine, where doctors evaluate stem cells ability to repair damaged tissues and organs in the body.

### **Marketing**

*Marketing*<sup>9</sup> is the process of determining the needs and wants of the target group of customers and rendering the required product or service more effectively and efficiently than the competitors and delivering a mutual value and maintaining the customer relationship in such a way that benefits both organization and its stake holders. Stem cell preservation is an innovation in the medical technology era. This innovation will be of great use, only if it successfully reaches the mass market. Thus the marketing plays a pivotal role in creating the awareness; persuading the people and making the people come forward to preserve their cord blood stem cells for better

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<sup>8</sup> Inception life bank cord blood program myths and misconceptions - <http://www.inception.com/>

<sup>9</sup> Philip Kotler – Marketing Management – Pearson Education.



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medical care in future uncertain situations. Marketing techniques along with IMC- Integrated Marketing Communication tools play a crucial role in creating the awareness, grabbing the attention, arousing the interest, building the conviction and persuading people to act favorably.

### **PPP Model**

A public–private partnership (PPP) is a government service or private business venture which is funded and operated through a partnership of government and one or more private sector companies. These schemes are sometimes referred to as PPP, P3 or P<sup>3</sup>. PPP involves a contract between a public sector authority and a private party, in which the private party provides a public service or project and assumes substantial financial, technical and operational risk in the project.

The union government has estimated an investment of \$320 billion in the infrastructure in the 10th plan. The major infrastructure development projects in the Indian state of Maharashtra (more than 50%) are based on the P3 model. In the 2000s, states such as Karnataka, Madhya Pradesh, Gujarat, and Tamil Nadu also adopted this model. As of 2011, the various sectors in India are expected get an investment of Rs. 20,27,169 crore (according 2006-2007 WPI)

### **Significance of the study**

The study connotes the significant role of marketing in creating the awareness among the people regarding preservation of the cord blood stem cells to cure incurable diseases, and the significance of the PPP model to make the stem cell preservation more affordable by reducing the medical expenditure<sup>10</sup> of the people and also the mortality<sup>11</sup> rate due to difficult to cure diseases with more predictable cure rates.

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<sup>10</sup> The medical expenses have gone up in an considerable way causing financial hardship More than 40% of earnings are spent on health ailments nowadays- Minister of State for Health and Family Welfare, Dinesh Trivedi

<sup>11</sup> *Mortality rate* is a measure of the number of deaths (in general, or due to a specific cause) in a population, scaled to the size of that population, per unit time.

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### **Objectives of the Study**

- 1.To ascertain the awareness among people regarding Cord Blood Stem Cells Preservation.
- 2.To assess the preparedness of the people in coming forward to preserve the stem cells.
- 3.To suggest marketing strategies to diffuse the innovative idea of cord blood stem cell preservation.
- 4.To suggest strategies for eradicating various myths concerning preservation of stem cells.
- 5.To devise a unique Public Private Partnership (PPP) business model, in order to systematize the stem cell preservation in an augmented mode.

### **Materials and Methods**

**Study Area:** Four cities with full fledged medical college hospitals from Karnataka and Andhra Pradesh namely, Bellary (Karnataka), Kadapa, Kurnool and Tirupati respectively from Andhra Pradesh

**Sample Design & Size:** Random sampling procedure was followed to select sample respondents from each of the four segments (Bellary, Kadapa Kurnool and Tirupati), looking into convenience 30 respondents were selected from each of the segments, thus the total number of respondents from the above segments (cities) were 120. I.e. **30 (respondents) X 4 (cities) = 120.**

**Sources:** The basic research design is based on primary source of data; however, secondary sources are also taken into consideration.

**Data Collection Procedure:** Data were collected from the above respondents, by using interview schedule specifically designed for the purpose; The important variables incorporated in the interview schedule as identifying factors attributable for restraining behavior towards stem cells preservation has been presented in the *Annexure-I*.

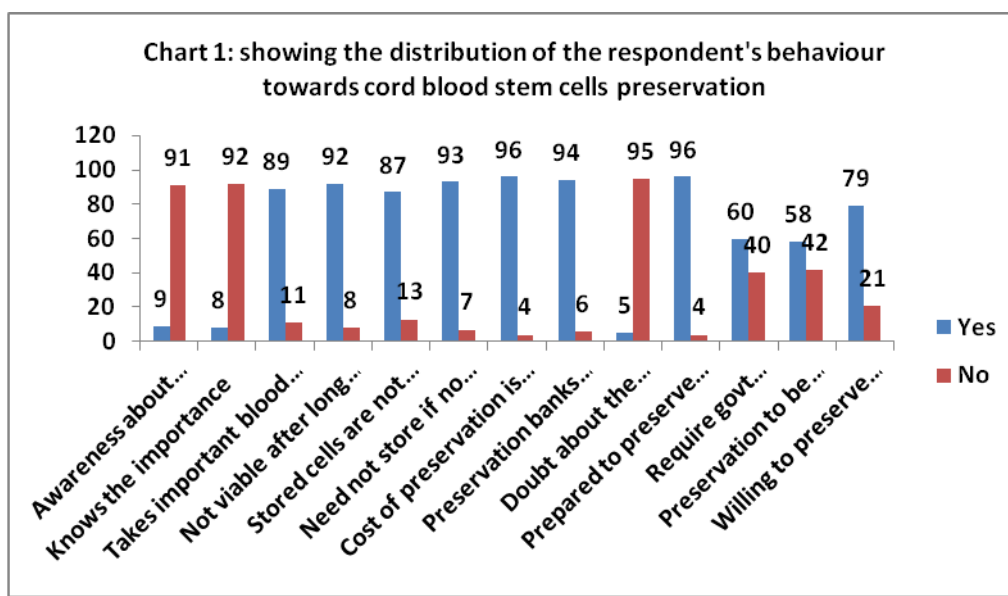
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**Analytical Technique:** Tabulated data was analyzed with the help of simple percentages to know the extent of identified factors in influencing the people's restraining behavior with respect to preserving their stem cells.

**Table No.1 Distribution of respondent's behaviour towards preservation of stem cells**

Restraining Factors	Yes	No	Total
Awareness about preservation	11(9.00)	109(91.00)	120(100.00)
Knows the importance	10(8.00)	110(92.00)	120(100.00)
Takes important blood away	107(89.00)	13(11.00)	120(100.00)
Not viable after long storage	10(92.00)	110(8.00)	120(100.00)
Stored cells are not used in future	16(87.00)	104(13.00)	120(100.00)
Need not store if no history of cancer exists	8(93.00)	112(7.00)	120(100.00)
Cost of preservation is high	115(96.00)	5(4.00)	120(100.00)
Preservation banks are not reliable	113(94.00)	7(6.00)	120(100.00)
Doubt about the quality and maintenance	6(5.00)	114(95.00)	120(100.00)
Prepared to preserve if quality infrastructure is provided	115(96.00)	5(4.00)	120(100.00)
Require govt monitoring of the preserving banks	72(60.00)	48(40.00)	120(100.00)
Preservation to be made mandate	70(58.00)	50(42.00)	120(100.00)
Willing to preserve stem cells	95(79.00)	25(21.00)	120(100.00)

**Note:** Figures in the parenthesis indicate percentages.



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**Findings**

1. The awareness level about the stem cells preservation is very low (9%).
2. People don't know that, cord blood stem cells are used to cure incurable diseases with predictable cure rates.
3. 89% of the respondents feel that the cord blood preservation takes important blood away from the body.
4. About 92% respondents feel, the stem cells stored for long period of time is not viable to use.
5. 87% respondents felt that the stored stem cells are not used in future if the storage is longer.
6. 93% respondents felt their families don't have history of cancer, hence storage is not required.
7. 96% of the respondents felt the cost of storage is very high.
8. 94% respondents felt the stem cells storage banks are not reliable.
9. 95% respondents are doubtful about the quality and maintenance of the stem cells preservation banks.
10. 96% of respondents are prepared to store if proper infrastructure facilities are installed.
11. 60% respondents feel the government should take active part in monitoring the functioning of the stem cells preservation banks.
12. 58% respondents felt the stem cells preservation should be made mandate for all child births in India.
13. 79% of respondents were willing to preserve immediately.

**Conclusion and Imperatives**

Cord blood stem cells preservation is the only means by which we can confront the incurable diseases with utmost effectiveness. People have many myths and misconceptions regarding the stem cells preservation; it is very important to eradicate the myths and motivate the people to preserve their stem cells for their secure and safe future health. In this direction, an attempt has been made to understand the myths; suggest strategies to eradicate these myths and devise a unique public private partnership model to combat effectively and efficiently the challenging diseases with more predictable cure rates and reduce the mortality rates due to incurable diseases. The trust among the people is very minimal with respect to stem cells preservation banks. Thus the governmental participation is very much required to enhance the people's trust. The ppp model and suggested marketing strategies to eradicate myths are discussed below:

**Suggested Marketing Strategies Intended to Motivate People to Preserve Cord Blood Stem Cells, and to Eradicate the Myths, are divided into six parts:**

1. Specially Designated Vehicle to propagate the importance of Cord Blood Stem Cells Preservation.
2. Print Aids
3. Audio Visual Aids
4. Advocacy by Eminent Persons
5. Awareness inception programs &
6. Trust Building Effort

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### 1. **Specially Designated Vehicle to propagate the importance of Cord Blood Stem Cells**

#### **Preservation:**

A special unique vehicle has to be designated to propagate the importance of the Stem Cells Preservation and to eradicate the Myths prevailing among the people.

This Special vehicle has to contain the following:

- Illustrative display of information about the importance & need for Stem Cells Preservation,
- A projector system and the screen to exhibit the short film to entice about Stem Cell Preservation,
- A qualified and trained counselor, informative booklets in vernacular languages.

### 2. **Print Aids:**

Crafting the informative posters (with Cartoon characters),

Banners (with pictorial descriptions & explanations) &

Billboards in the places of the public prominence.

All of the above should be done in English, Hindi and all the prominent vernacular languages.

### 3. **Audio Visual Aids:**

- Short films has to be produced and exhibited at schools, colleges, universities, offices, and other institutions, where there is a scope of exhibiting the film. (i.e., subject to availability of projector system and other infrastructural facilities to exhibit the film).
- Short film should be in English, Hindi and other prominent vernacular languages to reach the maximum number of people.
- The short films should make people aware of the importance and need of the stem cell preservation; benefits of the stem cells preservation; cost and procedure involved in cord

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blood stem cells preservation etc. with the aim of making people aware, motivated and prepared to preserve their stem cells.

### 4. **Advocacy by the Eminent Persons:**

- Advocacy about the importance of the voluntary blood donation is very pivotal as it is a powerful tool to influence the people's perception about the stem cell preservation.
- Services of the eminent persons have to be utilized to propagate the need for voluntary blood donation among the people.
- *People like, Medha Patkar, Anna Hazare, Aamir Khan, Chranjeevi etc.* would prove useful.

### 5. **Awareness Inception Programs:**

In order to incept the awareness about the need and importance of cord blood stem cells preservation, the following has to be done:

- Conducting the Essay Writing Competitions, quiz competitions, elocution competitions and other types of competitions at the schools and colleges, about the cord blood stem cells preservation & providing the participants certificates to boost the morale.
- Publishing articles, facts and statistics about the mortality rates as a result of incurable diseases, in the news dailies, magazines, journals and other mediums.
- Advertisements in Television, Newspapers and other Medias.
- Exhibiting trailers at movie theaters.
- Using posters and stickers to disseminate the idea at the public transport vehicles like, Buses, Trains etc.
- Posters and banners at the public utility places. Bus stands, railway stations, airports, hospitals, banks etc.

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### 6. **Trust Building Effort:**

It is observed that more than (80.00 %) of the people are having the opinion that the quality and maintenance of the stem cell preservation banks not credible and trustworthy, it is very important to eradicate this myth.

To achieve this, the ministry of Health, Department of Health and Public Welfare and other key departments of the government has to disseminate the information, that the stem cell preservation banks are under the strict scrutiny of the government and their activities are monitored at most vigilance.

### **PPP (Public Private Partnership) Model**

**Purpose of the PPP Model:** the model aims at maintaining the good infrastructure, equipments for preserving and maintaining the Cord Blood Stem Cells for extended years and make stem cells available at the right time to meet the adversities of the incurable diseases with more predictable cure rates.

### **Proposed Project Structure:**

A partnership between private and public sectors where the private sector is responsible for providing the certain prescribed facilities and services. In return, the public sector pays for these facilities and services, with the payment linked to the private sector's performance and benchmarked against the public sector's own previous cost in providing these facilities and services. The contract could be structured over 35–50 years.

### **Private Sector Role:**

Under the PPP contract, the following could be included:

- New Building / refurbishment and the minor works of the preservation bank building.



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- Setting up of cord blood stem cells preservation bank equipments and maintenance of the equipments.
- Provision of information management and technology solutions.
- Facilities management such as cleaning and medical waste disposal management.
- Helpdesk and reception management.

### **Public Sector Role:**

It sets performance parameters for the private sector player's role, monitors these parameters, and makes payments as per contract. The public sector will link the payment for services to risks transferred, its own cost structures, and experiences.

### **Technical issues:**

- The public sector authority signs a contract with a private sector "operator;"
- During the period of the contract, the operator will provide certain prescribed services;
- The operator is paid for the work over the course of the contract and on a "no service no fee" performance basis;
- The procuring authority will design an "output specification," which is a document setting out what the operator is expected to achieve;
- If the operator fails to meet any of the agreed standards, it would lose an element of its payment until standards improve;
- If standards do not improve after an agreed period, the public sector authority is entitled to terminate the contract.
- The payment is typically structured as an annual charge payable only on commencement of the entire cord blood stem cells preservation bank facilities and adjusted for performance and service availability standards.

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- Commencement of payment only on completion of the construction phase and commissioning of the building and equipment.
- In case of phased completion, payment triggers are set at the end of each phase.
- Private sector is entitled to an annual charge on the commissioning of the entire cord blood stem cells preservation bank facility.
- The payment mechanism provides for deduction due to performance shortfalls.

### **Potential private sector players expected to respond**

Existing hospital management companies, Cancer research institutes and transplant research institutes, Large construction and service provider companies, Specialized private companies—hospitality, cleaning, catering, and others, Indian Red Cross Society – IRCS & Private Hospitals & Blood Banks.

### **The expected outcomes of the model:**

- Improved supply & availability of the cord blood stem cells,
- Efficiency of the medical fraternity to deal with the incurable diseases,
- Efficiency in saving precious lives of the patients, as well as, facilities maintenance and management.
- Reduce the medical expenditure of the people in case of incurable diseases,
- Increased private sector investments (upfront investments, which are paid back on an annuity basis).

### **Value Addition from Developmental banks or Consultancy Firms**

- Transaction advisory assistance,
- Develop a detailed financial analysis, including analysis of typical capital and operating cost, Investment levels of private sector, existing state budgets,

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- Potential for user charging, affordability gap analysis,
- Understand the potential for use of central government schemes such as viability gap funding Or annuity model to support the financial and economic viability of this scheme,
- Develop a detailed output specification including the specification of buildings, equipment, standards, maintenance levels, and operating and/or performance levels,
- Assist in contracting process including bids, legal negotiations, and financial closure,
- Confirm legal position on provision of PPP contracts for health services.

**‘Ayushmaan Bhava lets make the Sanskrit quote a reality through Cord Blood Stem Cells Preservation’ ---- Let’s live 100 years.**

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*Annexure – I*

*Questionnaire*

1.Are you aware of the cord blood stem cells preservation?

Yes  No

2.Are you aware that the cord blood stem cells are useful in curing incurable diseases?

Yes  No

3.After my explanation to you regarding cord blood stem cells preservation, what is your opinion about preserving your children’s stem cells?

Willing to preserve  Not willing to preserve

4.Do you feel that, Cord blood collection takes important blood away from my baby?"

Yes  No

5.Do you feel that, the cord blood stem cells may not remain useful after long-term storage?"

Yes  No

## MARKETING OF STEM CELLS PRESERVATION THROUGH PPP

6. Do you feel that, Doctors would never treat the child with his or her own cord blood because it would contain the disease?
- Yes  No
7. Do you feel that "The baby or siblings will never need the stem cells if my family doesn't have a history of cancer?"
- Yes  No
8. Do you feel that "There is no reason for me to bank my baby's own stem cells when public banks can provide donated samples?"
- Yes  No
9. Do you feel that Future uses for cord blood are limited?"
- Yes  No
10. Do you feel that, Odds that my family would ever need banked cord blood, are so low that I wouldn't bother doing it."
- Yes  No
11. Do you feel that, the cost of preservation is very high?
- Yes  No
12. Do you feel that, the preservation banks present are not reliable?
- Yes  No
13. Do you doubt the quality control and maintenance of the equipments in cord blood preserving banks?
- Yes  No
14. Are you ready to preserve your baby's cord blood stem cells if proper reliable banker or infrastructure is provided?
- Yes  No
15. Do you feel that, the government role is required in establishing the adequate infrastructure for preservation of stem cells?
- Yes  No
16. By looking into the benefits of stem cells preservation, would you like to invest your money in preserving your child's stem cells?
- Yes  No

## MARKETING OF STEM CELLS PRESERVATION THROUGH PPP

17. Do you require the governments monitoring in quality control, maintenance of the stem cell preserving banks?

Yes  No

18. Do you agree, if the stem cells preservation is made a mandate for every child birth in India?

Yes  No