

Important Information  
All Expectant Parents  
Need to Know

cordlife   
one chance, one choice.

# Your Baby's Precious Cord Blood

The Gift of a Lifetime

您宝宝珍贵的脐带血  
一生的无价之宝



Accredited



SGX



# Make the Right Choice: Save Life's Most Precious Cells for Your Family

## Did You Know?



**1 in 217 persons<sup>1</sup>** will need stem cells for treatment in his/her lifetime.



In Singapore, **40% - 60% of patients<sup>2</sup>** who require stem cell transplants are unable to find a suitable match from bone marrow donors or public cord blood banks each year. The odds of finding a match within the same racial group is only **1 in 20,000<sup>3</sup>**.



**Cord blood** does not require a perfect match between donor and patient, making it easier to find a suitable match within the family.<sup>4</sup>



**Cord blood stem cells as regenerative medicine.**

Cord blood stem cells are increasingly being used and trialed as an alternative in regenerative medicine to repair or replace damaged or diseased tissue and organs.



**1 in 3 persons<sup>5</sup>** will benefit from regenerative medicine therapy.



**Own stem cells required.** Regenerative therapies usually require the patient's own stem cells for safety reasons.

1. Nietfeld JJ, Pasquini MC, Logan BR, et al. Lifetime probabilities of haematopoietic stem cell transplantation in the U.S. *Biology of Blood and Marrow Transplantation*. 2008; 14:316-322.
2. Singapore Cord Blood Bank website. <http://www.sccb.com.sg/donate/WhyDonate/Pages/Home.aspx>. Accessed September 14, 2016.
3. Chew J. Criterion for new stem-cell transplant 50% match. *The Straits Times*. July 18, 2013: 12-15.
4. Beatty PG, Boucher KM, Mori M, et al. 2000. Probability of Finding HLA-mismatched Related or Unrelated Marrow or Cord Blood Donors. *Human Immunology*. 61, 834-840.
5. Harris DT. Cord blood stem cells: a review of potential neurological applications. *Stem Cell Rev*. 2008; 4:269-274.

# Stem Cells: An Essential Healthcare for Every Child

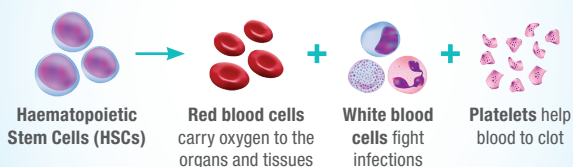
As parents, there is nothing more important than protecting our child. While we cannot prevent diseases from striking, we can have a greater peace of mind by storing our baby's unique cord blood stem cells, a resource that can only be collected at birth. By storing stem cells now, you are giving your child and family more medical options in the future.

## What are Stem Cells?

Cord blood is a rich source of Haematopoietic Stem Cells (HSCs) which are responsible for replenishing blood and regenerating the immune system. HSCs are known as 'precursor cells' as they have the unique ability to differentiate into the different types of cells found in the body, namely:

- **Red Blood Cells** - transports oxygen
- **White Blood Cells** - produces antibodies and fight infections
- **Platelets** - assists in blood clotting

**Haematopoietic Stem Cells** differentiate into other blood cells including these illustrated here:



## What Can Stem Cells Do for Your Family?

The cord blood stem cells you store for your baby are a perfect match for him/her. It is also a ready source of genetically related stem cells for someone else in the family. Unlike bone marrow which requires a perfect match between donor and patient, the probability of finding a match among family members using cord blood stem cells is higher. By storing the cord blood from each child, parents can increase the chance of locating a match within the family.<sup>4</sup>

**Patients who received stem cells from a relative recovered better and survival rates also doubled.<sup>6</sup>**

6. Gluckman et al. Outcome of Cord-Blood Transplantation from Related and Unrelated Donors. *The New England Journal of Medicine*. 1989;321:1174-1178.

# Why Bank Your Baby's Cord Blood?

## More cord blood released for self-use

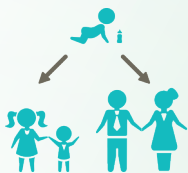
Cordlife has released cord blood units for transplants over the years, of which, **63%**<sup>7</sup> were used for **autologous** treatment.



For oneself for a lifetime  
(Autologous)

## Better outcome with related cord blood

Studies have shown that the 3-year overall survival rate for patients receiving related cord blood was **95%** compared to **61%** for patients who received unrelated cord blood.<sup>8</sup>



For related recipients  
(Allogeneic)

Cord blood stem cells are being used as a standard form of treatment for over **85 diseases**<sup>9</sup>, some of which are listed within the table below.

## More than 85 diseases treated with stem cells<sup>10</sup>

Disease Grouping	Examples	Autologous	Allogeneic
Blood cancers	Acute Lymphoblastic Leukaemia		✓
	Multiple Myeloma	✓	✓
	Plasma Cell Leukaemia	✓	✓
Solid tumours	Neuroblastoma	✓	
	Lymphoma		✓
	Retinoblastoma	✓	
Blood disorders	Thalassemia Major		✓
	Aplastic Anaemia		✓
Immunodeficiency disorders	Severe-combined Immune Deficiency		✓
Metabolic disorders	Hurler Syndrome		✓

7. Based on Cordlife's cord blood release track record as at June 2016.

8. Bizzetto R, Bonfim C, Rocha V, et al. Outcomes after related and unrelated umbilical cord blood transplantation for hereditary bone marrow failure syndromes other than Fanconi anemia. *Haematologica*. 2010;96(1):134-141.

9. Parent's Guide to Cord Blood Foundation website. <http://parentsguidecordblood.org/diseases.php>. Accessed January 5, 2016.

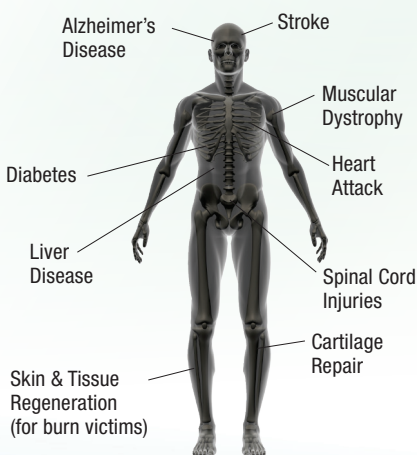
10. List of some diseases that have been treated with cord blood or other sources of haematopoietic stem cells. Stem cell therapies continue to change and evolve quickly. Banking cord blood does not guarantee that the cells will provide a cure or be applicable in every situation. The application will ultimately be determined by the attending physician.

## Therapies in clinical trials using stem cells

Worldwide medical research continues to unlock further potential uses of stem cells. To date, most of these therapies require the patient's own stem cells, not those from a donor. Once these advance to successful therapies, families who have stored their children's cord blood can be part of this medical revolution and will have more medical options available to them.

Name of Disorder	Estimated Incidence Rate	Autologous	Allogeneic
Cerebral Palsy	3 in 1000 births <sup>11</sup>	✓	✓
Autism	1 in 68 children <sup>12</sup>	✓	
Hearing Loss (acquired sensorineural)	1 in 11 people (of which 25% of them were due to acquired causes.) <sup>13</sup>	✓	
Hypoxic Ischemic Encephalopathy	2 – 9/1000 births <sup>14</sup>	✓	
Kidney plus Stem Cell Transplant	1 in 2,890 (chronic kidney disease stage 5) <sup>15</sup>		✓
Lupus	0.9 – 3.1 per 100,000 population <sup>16</sup>	✓	✓

## The great potential of stem cells



11. National Center for Biotechnology Information website. <http://www.ncbi.nlm.nih.gov/pubmed/24117446>. Accessed December 1, 2015.

12. National Center for Biotechnology Information website. <http://www.ncbi.nlm.nih.gov/pubmed/2467096>. Accessed September 16, 2016.

13. Annals, Academy of Medicine, Singapore website. <http://www.annals.edu.sg/cpdMay05.html>. Accessed December 1, 2015.

14. National Center for Biotechnology Information website. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3446029>. Accessed December 1, 2015.

15. National Registry of Diseases Office website. <https://www.nrdo.gov.sg/docs/librariesprovider3/Publications--Kidney-Failure/report-1999-till-2014-interim.pdf?sfvrsn=0>. Accessed December 1, 2015.

16. National Center for Biotechnology Information website. <http://www.ncbi.nlm.nih.gov/pubmed/22052624>. Accessed December 1, 2015.

# Cordlife Takes Stringent Steps to Protect Your Baby's Cord Blood

Every step in the process of storing your baby's cord blood is critical as any variation may affect the usability of the cord blood unit. That is why at Cordlife, we choose not to outsource most of our key processes to a third-party laboratory. The flow chart below illustrates some of the major steps that Cordlife undertakes to protect the viability of your baby's cord blood.

## 1 Safe and Painless Collection at Birth



After the delivery of your baby, your doctor will clamp the umbilical cord and drain the cord blood into a sterile double-wrapped blood bag. This safe and quick procedure does not interfere with the birthing process.

## 2 Retrieval and Transportation Within 24 Hours



After your baby is delivered, simply call our 24-hour hotline and we will hand-deliver the cord blood under stringent controls to our stem cell processing and storage laboratory within 24 hours.

## 3 Thorough Checks to Prevent Mix-up



Prior to processing your baby's cord blood, we will carefully inspect the identity of the cord blood collected to ensure that the unit belongs to you. We will also confirm that the respective maternal blood and all required documentation are included. The maternal blood is then sent to our partner laboratory to test for infectious diseases.

## 4 Sterile Preparation of the Cord Blood



The cord blood is then transferred to a biosafety cabinet where a small amount is extracted for testing. This step must be done within the biosafety cabinet to prevent contamination.

**5**

## High Cell Recovery of up to 99.88%\* with Sepax®2 into a Multiple Compartment Cryobag



Every cord blood unit is processed individually with the Sepax®2 technology to prevent cross-contamination. Before the cord blood is processed, the blood bag is connected to a single-use processing kit and Sepax®2 system. The system will automatically isolate the stem cells into a connecting multiple compartment cryobag.

**6**

## Fully Automated Stem Cell Preparation with Smart-Max™

The cryobag is placed into Smart-Max™, a fully automated cryoprotectant infuser, mixer and cooling device that allows for the consistent preparation of stem cells for cryopreservation. Unlike other devices that require manual handling, Smart-Max™ has high precision and is able to inject 0.5ml of cryoprotectant per minute at a constant and pre-defined temperature. Any deviation to this process may affect cell viability, therefore automation helps to ensure that cryoprotectant is homogeneously mixed with the cells to protect their viability during cryopreservation.

**7**

## Controlled-Rate Freezing to Preserve Viability



Once the cryoprotectant has been added, stem cells are frozen gradually in a controlled-rate freezer where the temperature is lowered by 1°C – 2°C per minute. This gradual process protects the viability of the stem cells.

**8**

## Long-term Cryopreservation

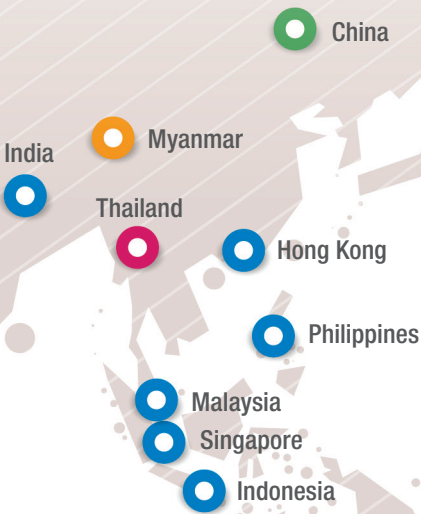
The cryobag is then transferred into a vapour-phase liquid nitrogen storage tank for long-term cryopreservation. This will remain safely stored and ready for immediate use should the need arise. Our tanks are equipped with a high grade monitoring system that scans for any out-of-range conditions to ensure that the temperature is maintained within the optimum range at all times. In the remote chance of an unexpected emergency, our laboratory is also equipped with an uninterrupted power supply.



# Why do More Parents Bank with Cordlife?

## Over 15 Years of Proven Expertise in Stem Cell Banking

With its regional headquarters in Singapore and a vast network of facilities in Hong Kong, India, Indonesia, Malaysia and the Philippines, Cordlife has accumulated a wealth of experience in stem cell processing and cryopreservation.



-  Cordlife Group Limited and its subsidiaries
-  Cordlife Group Limited's associate
-  Cordlife Group Limited's sub-licensing partner
-  Cordlife Group Limited's Marketing Agent



## SGX Mainboard Listed • Transparent Credibility

Cordlife Group Limited is a Singapore Exchange Mainboard listed company and is audited annually by Ernst & Young. As stem cell transplants or therapies may take place now or much later in life, choosing a company with a sound and transparent financial status is crucial in ensuring that the company is one you can trust to be with you for the long haul.

## Technology and Quality Pioneer

Over the years, the Cordlife Group has achieved several firsts to ensure that our clients are given the best in the industry so as to achieve better medical outcomes. In 2007, Cordlife was the world's first cord blood bank to be conferred the 'Technology Pioneer' status by the World Economic Forum. We have also achieved the following list of firsts and we are committed to continue striving for the best to benefit our clients.

2001

First cord blood bank in Singapore and first to use multiple compartment cryobags for cryopreservation.

2005

First to be accredited by AABB – an international accreditation association that ensures stringent quality on the processing and storage of cord blood units.

2008

First to invest in Sepax® technology – a fully automated processing technology that harvests more stem cells from cord blood.

2010

First to offer more options on stem cell banking beyond cord blood banking.

2013

First to upgrade to Sepax®2 technology – a fully automated cord blood processing system for optimum stem cell recovery.

2015

- First to invest in Smart-Max™ – a fully automated cryoprotectant infuser, mixer and cooling device that prepares cord blood for cryopreservation.
- First family cord blood bank in Singapore to be accredited by two independent world-class cord blood associations – AABB and FACT.

## Committed for the Long Haul • Fully-Owned Laboratory

The odds of requiring stem cells for medical treatment increases as one ages<sup>17</sup>. Therefore, choosing a reliable and reputable company that will safeguard this precious resource on behalf of your baby and family for the long haul is of utmost importance. At Cordlife, we take this commitment very seriously. This is why we invest millions of dollars to acquire our own properties and design them specifically for stem cell processing and storage. We firmly believe that stem cell processing and cryopreservation are the most important aspects of our service, which is why we do not outsource these critical steps to external facilities.



## Managed by Extensive Medical and Technical Experts

All medical-related processes at Cordlife are managed by highly qualified medical doctors specialising in pathology and haematology. We also have a group of highly trained laboratory and technical directors with PhD qualifications who are dedicated to looking into all the technical aspects of our business.



17. Nietfeld JJ, Pasquini MC, Logan BR, et al. Lifetime Probabilities of Haematopoietic Stem Cell Transplantation in the U.S. *Biology Blood Marrow Transplant*. 2008 March; 14(3):316-22.

## Quality You Can Trust

Cordlife Group's expertise in cord blood banking has been recognised by many world-class gold standards and government bodies. These include:



Singapore  
FACT Accreditation



Singapore  
AABB Accreditation



Singapore  
Good Distribution Practice for  
Medical Devices Certification



Singapore  
Ministry of Health



Hong Kong  
AABB Accreditation



Hong Kong  
ISO 9001:2004  
Certification



India  
AABB Accreditation



India  
ISO 9001:2008  
Certification



Indonesia  
ISO 9001:2008  
Certification



Philippines  
Department of  
Health

## Partnerships with Clinical Experts to Give Your Family Priority Access to Stem Cell Applications

At Cordlife, aside from ensuring that our day-to-day operations meet the highest global quality standards in stem cell banking, we also play a part in advancing the clinical applications of stem cells by working with renowned clinicians around the world. As a Cordlife client, this gives your family priority access to clinical applications which are important, especially for conditions that currently have no known cure.

2002

Cordlife was the first family cord blood bank to release a cord blood unit to support a sibling transplant for the treatment of leukaemia in Singapore.<sup>18</sup>

2009

We were honoured to work with leading neurosurgeon Dr Keith Goh to enable the first-ever stem cell infusion for the treatment of cerebral palsy in Singapore.<sup>19</sup>

2016

Cordlife is currently working closely with Dr Michael Chez – an autism and epilepsy treatment pioneer from the Sutter Medical Group and Sutter Neuroscience Institute, to introduce a cord blood clinical trial for the treatment of autism in Singapore.

18. Chang, Ai-lien, Soh, Natalie. Leukaemia boy saved - by baby sister. *The Straits Times*. July 1 2004: Prime News, 6.

19. Tan, Judith. Cerebral palsy baby helped by cord blood. *The Straits Times*. November 3 2009: Home, B6.

# **Cordlife Care360°:** **A 360° Safeguard for You and Your Family**

At Cordlife, we understand your needs and concerns as a parent. That is why we designed the Cordlife Care360° programme to ensure that we take care of you and your family's health in the most holistic way possible.

## **Cordlife Shield:360°<sup>^</sup>**

### **Tender Loving Care for You and Your Family**

Cordlife offers coverage for possible pregnancy and childbirth complications<sup>^</sup>, so that you and your family can have a greater peace of mind.

## **Cordlife Pledge:360°**

### **Our Pledge to Quality Processing and Storage Standards**

Cordlife assures you of a cord blood unit of suitable match or SGD\$50,000\* to defray medical costs should the cord blood unit lose its viability at the point of transplant<sup>^</sup>.

## **Cordlife Protect:360°**

### **Freedom for You and Your Family**

Cordlife, together with an international insurer, will waive all future storage payments should you or your spouse pass away or suffer from Total and Permanent Disability (TPD)\*. Depending on the payment plan you have elected, your family may also receive a token sum\*.

## **Cordlife Assure:360°**

### **Assurance Tests prior to a HSC Transplant**

Cordlife will cover the cost of matching (HLA resolution test) and viability (CFU Assay) prior to a Haematopoietic Stem Cell (HSC) transplant\*. This is our assurance and commitment to you should the need to release your child's cord blood unit ever arise.

## **Cordlife Guard:360°**

### **Safeguarding You and Your Family**

Cordlife has taken additional insurance coverage to safeguard you and your family from financial loss that results from direct malpractice\*.

<sup>^</sup> Conditions apply.

\* Kindly note that this page is for general information only. Please refer to the Cordlife Service Agreement for full details and the terms and conditions. Cordlife Group Limited reserves the right to amend or cancel any of the benefits listed in this brochure without prior notice. International quality standards may differ between the time of enrolment and the time of release of your baby's cord blood unit for transplant. All reasonable efforts will be made to adhere to the prevailing standards at the time of release of your baby's cord blood unit. HLA testing and CFU Assay may or may not cease to become a mandatory quality check.

# CordBlood Network: Protecting 3 Generations of Your Family with Your Baby's Cord Blood

At Cordlife, we understand that the chance to store our own precious cord blood was not available before.

This is why we have initiated the CordBlood Network programme which assists in the search for a matching cord blood unit should the need arise for your child, his/her biological parents and biological grandparents.

With CordBlood Network, you can now protect 3 generations of your family simply by storing your baby's cord blood with Cordlife.



## How Do I Enrol with Cordlife?

- 1** Call **6238 0808** to set an appointment at your preferred meeting venue. Alternatively, you may visit us at any of our consultation booths.
- 2** Once the enrolment procedure is completed, we will provide you with a **personalised cord blood collection kit**.
- 3** **Inform** your doctor.
- 4** **Bring your personalised cord blood collection kit** to the hospital on the day of delivery.
- 5** **Call us at 9388 0567** from the hospital to inform us of your baby's birth.

# Frequently Asked Questions



## How long can cord blood be stored?

Scientists believe that cord blood which has been processed according to international standards, and stored at cryogenic temperatures of below  $-135^{\circ}\text{C}$ , can be stored indefinitely and still remain viable<sup>20</sup>.

## Why doesn't Cordlife store cord blood in two separate locations?

As Singapore is geographically small and free from natural disasters, there is no real need to store your baby's cord blood in different locations. Splitting the cord blood into multiple cryobags increases the risk of contamination and the possibility of a sample mix-up. Furthermore, this does not guarantee more cells for multiple treatments. According to Dr. Pablo Rubinstein, co-founder of the New York Blood Center, "given that cell dose is an important predictor of successful transplant outcomes, such 'split cord blood units' might place their potential recipients at a disadvantage, and their application therefore unlikely, unless successful stem cell expansion becomes practical in this setting<sup>21</sup>".

## Public or Family Cord Blood Banking – Which one to choose?<sup>22</sup>

Public Cord Blood Bank	Family Cord Blood Bank
Family donates cord blood and as such, relinquishes all rights to the unit	Family stores cord blood privately for their use only
No cost to donate cord blood	Family pays the family cord blood bank a processing and storage fee
Sample gets HLA typed and listed on International Donor Registries where it is publicly searchable for an unrelated transplant	Sample is not HLA typed, and not listed on any International Donor Registries unless requested by the family as the unit is reserved for the child (autologous) and the family
Sample is released and procured off one of the International Donor Registries if a match is found	Sample is released only upon request by the family and usually at no cost to the parents

20. Broxmeyer HE, Srour EF, Hangoc G, et al. *Proceedings of the National of Sciences of the United States of America*. 2002; 100/2: 645-650.

21. Rubinstein P. Cord blood banking for clinical transplantation. *Bone Marrow Transplantation*. 2009; 44:635-642.

22. Parent's Guide to Cord Blood Foundation website. <http://parentsguidecordblood.org>. Accessed March 20, 2014.

## Bone marrow is another source of Haematopoietic Stem Cells (HSCs). I can always find a bone marrow donor, so what's the point of storing my baby's cord blood?

There are several advantages of storing your baby's cord blood stem cells as compared to finding a bone marrow stem cell donor.

- A guaranteed match for autologous transplants (where the donor and recipient are the same individual).
- An available supply of stored HSCs compares well against having to conduct a national or international search which can be costly and time-consuming during a time critical situation.
- Lower risk of Graft vs Host Disease for autologous transplants, a situation where the transplanted tissue attacks the patient's own tissue.
- Ease of collection, which is pain-free and risk-free to both mother and child.
- Cord blood stem cells require a less stringent HLA matching compared to bone marrow stem cells. Furthermore, the probability of finding a 6/6 HLA bone marrow match within the family is 25%. However, if cord blood is stored, there is a 40% chance of a 4/6 match within the family. This makes it 60% more likely to find a matching cord blood unit as compared to sourcing for a bone marrow match within the family.<sup>23</sup>

### Advantages of Using Cord Blood Over Other Sources

Source	Bone Marrow	Peripheral blood	Cord Blood
<b>Collection</b>	Multiple extractions	Needs multiple growth-hormones injections	Quick, painless & risk-free
<b>Fetal derived?</b>	No	No	Yes
<b>Availability</b>	Donor search	Donor search	Readily available (for family bank)
<b>Graft Vs Host Disease</b>	High risk	Higher risk	Minimal risk, 100% match for autologous transplant
<b>Cost of obtaining a matching unit</b>	As high as US\$30,000	As high as US\$30,000	100% ownership (for family bank)

23. Beatty PG, Boucher KM, Mori M, et al. Probability of Finding HLA-mismatched Related or Unrelated Marrow or Cord Blood Donors. *Human Immunology*. 2000; 61: 834-840.



### Take the First Step Today.

Storing your baby's cord blood is an important decision. We encourage you to enrol during your second trimester, or just before your third trimester, if possible. However, it is never too early or too late in your pregnancy to enrol. Call us to arrange a non-obligatory consultation at your convenience.

### Enjoy Cordlife's Service 24/7!

Cordlife provides you with a personal, around-the-clock care and support. We are available 365 days a year to answer any urgent questions which you or your doctor may have – before, during or after the delivery of your baby. If you are already in the delivery suite and keen to sign up for cord blood banking, please call us now.

The opportunity to store  
your baby's cord blood only comes once in a lifetime.

**MAKE THE RIGHT CHOICE WITH CORDLIFE.**

Fully payable by **BABY BONUS\***

Call us for more information.

\*Terms & conditions apply.

### FIND OUT MORE AT:

**24-Hour Hotline**  
**6238 0808**

**Email Address**  
**info@cordlife.com**



LIKE US ON  
[Facebook.com/cordlifessg](https://www.facebook.com/cordlifessg)

**Website**  
**[www.cordlife.com/sg](http://www.cordlife.com/sg)**



# 做出明智的选择： 为您的家人储存 生命中最珍贵的 细胞

## 您知道吗？



每**217人**之中，就有**1人**<sup>1</sup>在一生之中可能需要应用干细胞进行治疗。



在新加坡，每年需要进行干细胞移植的病患中，大约有**40%-60%**<sup>2</sup>无法从骨髓捐赠者或公共脐带血库中，找到适合与匹配的干细胞。要在同一种族中找到匹配的干细胞，几率只有**20,000分之1**<sup>3</sup>。



**储存脐带血**进行移植，不要求捐献者和病患间的白细胞抗原完全吻合，因此更容易在家庭成员之间找到适合的配对。<sup>4</sup>



**脐带血干细胞用于再生医学**。越来越多脐带血干细胞已普遍被运用与试验作为代替再生医学，可用于修复，替换受损或者病变的组织或器官。



每**3个人**当中，就有**1人**<sup>5</sup>可能会从再生医学疗法中获益。



**必须使用自体干细胞**。这些疗法一般需要使用病患本身的干细胞，以策安全。

1. Nietfeld JJ, Pasquini MC, Logan BR, et al. Lifetime probabilities of haematopoietic stem cell transplantation in the U.S. *Biology of Blood and Marrow Transplantation*. 2008; 14:316-322.
2. Singapore Cord Blood Bank website. <http://www.scbb.com.sg/donate/WhyDonate/Pages/Home.aspx>. Accessed September 14, 2016.
3. Chew J. Criterion for new stem-cell transplant 50% match. *The Straits Times*. July 18, 2013: 12-15.
4. Beatty PG, Boucher KM, Mori M, et al. 2000. Probability of Finding HLA-mismatched Related or Unrelated Marrow or Cord Blood Donors. *Human Immunology*. 61, 834-840.
5. Harris DT. Cord blood stem cells: a review of potential neurological applications. *Stem Cell Rev*. 2008; 4:269-274.

## 干细胞：每个孩子必备的健康保障

身为父母，没有什么事情比得上保障自己的孩子来得重要。孩子生病是在所难免的，但是我们可以让自己和孩子有多一份安心。那就是采集孩子出生时独有的脐带血干细胞，保存以备不时之需。这样一来，孩子和家人就能享有更多医疗选择。

### 什么是干细胞？

脐带血含有丰富的造血干细胞 (HSC)，其主要功能是补充血液与协助免疫系统再生。造血干细胞也是身体里的“原始造血细胞”，因为它具有独特的能力，可以分化成不同类型的细胞，如：

- 红血球：输送氧气
- 白血球：产生抗体和抵抗感染
- 血小板：助于血液凝固

造血干细胞可分化成其它血细胞，  
包括以下所列举的：



### 干细胞对您的家人有什么用途？

您为宝宝所储存的脐带血内的干细胞将与他/她完全吻合。除此之外，对于其他家庭成员而言，这个珍贵的资源也会使他们即时可得具备家庭基因的干细胞来源。骨髓移植需要捐赠者与病患的骨髓完全吻合。但是，如果运用脐带血中的干细胞就不需要两方拥有完全的吻合度。因此，想找到适合的配型也更加容易。只要把每个孩子的脐带血储存，倘若未来有什么医疗需求，要在家庭成员之间找到骨髓吻合的几率即可大大提高。<sup>4</sup>

储存脐带血的手足同胞越多，彼此间互相提供适合进行移植或治疗的配型，机率就更高。<sup>6</sup>

6. Gluckman et al. Outcome of Cord-Blood Transplantation from Related and Unrelated Donors. *The New England Journal of Medicine*. 1989;321:1174-1178.

# 为什么要储存宝宝的脐带血?

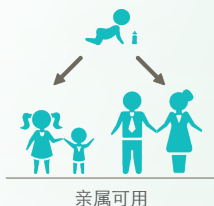
## 更多的脐带血被自用

康盛人生多年来一直为移植发放脐带血单位, 其中**63%<sup>7</sup>**是用于**自体移植**。



## 使用亲属脐带血疗效更佳

研究显示, 接受亲属脐带血移植的病患, 三年整体存活率高达**95%**, 接受非亲属脐带血移植者存活率则仅为**61%<sup>8</sup>**。



脐带血干细胞已被用于超过**85种疾病<sup>9</sup>**的标准治疗方法。以下图表列明了其中几种疾病。

## 超过85种疾病可使用干细胞治疗<sup>10</sup>

疾病分组	例子	自体	异体
血癌	急性淋巴细胞白血病		✓
	多发性骨髓瘤	✓	✓
	浆细胞白血病	✓	✓
实体肿瘤	神经母细胞瘤	✓	
	淋巴瘤		✓
	视网膜母细胞瘤	✓	
血液疾病	重型地中海贫血		✓
	再生障碍性贫血		✓
免疫缺陷	重症综合免疫缺陷		✓
代谢障碍	粘多糖病I-H型		✓

7. 康盛人生截至2016年6月脐带血的发放记录。

8. Bizzetto R, Bonfim C, Rocha V, et al. Outcomes after related and unrelated umbilical cord blood transplantation for hereditary bone marrow failure syndromes other than Fanconi anemia. *Haematologica*. 2010;96(1):134-141.

9. Parent's Guide to Cord Blood Foundation website. <http://parentsguidecordblood.org/diseases.php>. Accessed January 5, 2016.

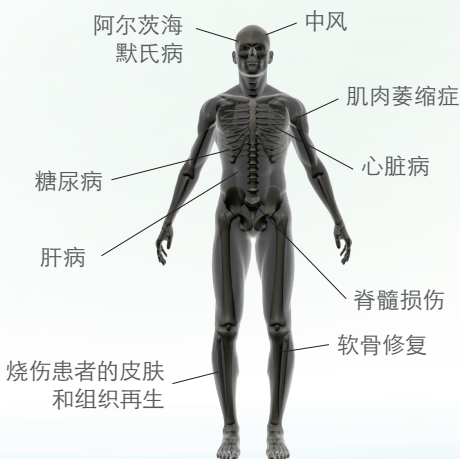
10. 上表列出曾使用脐带血或其他造血干细胞进行治疗的疾病。干细胞疗法仍然在不断快速进步。储存脐带血并不能保证有关细胞能在所有情况中都能适用或提供治疗。细胞的应用最终将由主治医生决定。

## 使用干细胞的临床试验

全球医学研究日新月异,持续发掘出干细胞更多的潜在用途。至今,有关疗法多数需要使用病患本身的干细胞。当各方面的研究进展成功转化为标准疗法后,许多储存孩子脐带血的家庭将从这项医学革新中受惠,享有更多的医疗选择。

失调症名称	估计发生几率	自体	异体
脑瘫	1000 新生婴儿 即有 3 例 <sup>11</sup>	✓	✓
自闭症	68 名孩童即有 1 例 <sup>12</sup>	✓	
听力损失 (后天感音神经性)	11 人中即有 1 例, 其中 25% 为后天 成因 <sup>13</sup>	✓	
缺氧缺血性脑病	1000 名新生婴儿 即有 2-9 例 <sup>14</sup>	✓	
肾脏及干细胞移植	2,890 人中即有 1 例 (慢性肾病第 5 阶段) <sup>15</sup>		✓
狼疮	100,000 人中 即有 0.9 - 3.1 例 <sup>16</sup>	✓	✓

## 干细胞的巨大潜力



11. National Center for Biotechnology Information website. <http://www.ncbi.nlm.nih.gov/pubmed/24117446>. Accessed December 1, 2015.

12. National Center for Biotechnology Information website. <http://www.ncbi.nlm.nih.gov/pubmed/2467096>. Accessed September 16, 2016.

13. Annals, Academy of Medicine, Singapore website. <http://www.annals.edu.sg/cpdMay05.html>. Accessed December 1, 2015.

14. National Center for Biotechnology Information website. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3446029>. Accessed December 1, 2015.

15. National Registry of Diseases Office website. <https://www.nrdo.gov.sg/docs/librariesprovider3/Publications--Kidney-Failure/report-1999-till-2014-interim.pdf?sfvrsn=0>. Accessed December 1, 2015.

16. National Center for Biotechnology Information website. <http://www.ncbi.nlm.nih.gov/pubmed/22052624>. Accessed December 1, 2015.

# 一丝不苟，保护好 您宝宝的脐带血

储存脐带血的每一个步骤都非常关键，任何一步稍有疏漏，都可能影响脐带血单位的品质和使用性。康盛人生对于这一点非常重视，因此流程中的关键步骤，都不会交由外部的第三方实验室进行。以下的储存流程详细说明康盛人生所采取的重要步骤，以保护您宝宝脐带血的活性。

## 1 出生时采集， 安全无痛



宝宝出生后，医生将脐带夹紧然后剪断，并把脐带血导入无菌双层密封血袋。有关步骤安全快速，而且不会影响分娩。

## 2 24小时内收取运送



在您的宝宝出生后，请拨打我们的24小时热线。24小时内，我们会派人将脐带血采取严格监控措施，运送至我们的干细胞处理和储存实验室。

## 3 多重仔细检查核对， 准确无忧，不会混淆



脐带血在进行处理前，我们将详加检查，确保所收集的脐带血单位属于您，以及相关必须文件和母体血液是否齐全。母体血液将送至与我们合作的实验室，接受传染病检查。

## 4 脐带血经过无菌处理



接着，脐带血单位将转入生物安全柜，再抽取少许进行测试。这一步必须在安全柜内进行，以免受到污染。

5

## 通过 Sepax®2 处理系统存入多隔间冻存袋, 干细胞回收率高达 99.88%\*

为了避免交叉感染, 每一个单位的脐带血将通过 Sepax®2 进行个别处理。处理以前, 血袋将连结至一件一次性处理工具和 Sepax®2。系统将把干细胞自动分离存入相连的多隔间冻存袋。



6

## 使用 Smart-Max™ 对干细胞进行全自动处理

冻存袋将放入 Smart-Max™, 一个全自动化的冷冻保护剂输注器, 混合和冷却仪器, 在严格监控和稳定的环境下处理干细胞。Smart-Max™ 有别于其他人工处理仪器, 其精密度更高, 能以预设的温度、每分钟自动稳定地注入 0.5 毫升冻存保护剂。处理过程稍有疏忽即可能影响干细胞活性, 因此自动化程序能够确保冻存保护剂能和细胞均匀混合, 在冻存时保持活性。

7

## 严控冷冻速率, 保持干细胞活性



干细胞在加入冻存保护剂后, 将在控制速率的冷冻器中逐渐冷冻、每分钟降低 1°C – 2°C, 以保持细胞活性。

8

## 长期冷冻保存

冻存袋将转移到气相液氮储存缸, 开始长期冷冻保存。有关脐带血单位将获得妥善保存, 在有需要时马上即可提取使用。我们的储存缸安装了先进的监控系统, 能辨识异常状态, 确保温度处于理想范围内。我们的实验室还设有后备系统, 以防万一出现紧急状况, 确保脐带血单位将仍然安全地存放在于最佳温度。



\*康盛人生截至 2015 年 5 月 15 日的实际数据。

# 为什么越来越多父母选择了康盛人生储存服务？

## 拥有超过15年储存干细胞的专业经验

本公司总部设于新加坡，在香港、印度、印度尼西亚、马来西亚和菲律宾各地都有我们经营的设施网络。此外，康盛人生积累了丰富的干细胞处理和冷冻保存的经验。



- 康盛人生集团有限公司及其属下机构
- 康盛人生集团有限公司相关机构
- 康盛人生集团有限公司授权伙伴
- 康盛人生集团有限公司营销代理



## 新加坡交易所主板上市 • 运作透明度高而深受信赖

康盛人生集团在新加坡交易所主板挂牌上市，每年均由安永会计事务所核查公司账目。干细胞移植或治疗可能随时需要，也可能在年纪较大时需要，因此选择一家财务稳固健全、运作透明度高可信的公司，是您获取长期保障的关键。

## 科技和品质先驱

康盛人生集团多年来秉承优质信念，创下业界多项第一，确保为旗下客户提供业界最好的产品与服务，让客户取得更理想的疗效。在2007年，康盛人生成为全球第一家获得世界经济论坛颁发“科技先驱”殊荣的脐带血库。下表还列出本公司多项第一而我们承诺继续努力不懈，为客户带来最好的服务和产品品质。

2001

新加坡首家脐带血库，也是第一家使用多隔间冻存袋。

2005

首家取得 AABB 认证的脐带血库。AABB 是国际顶尖血库认证机构，为血液处理和储存设下严格品质要求。

2008

首家投资使用 Sepax® 全自动处理技术的业者，能从脐带血中提取更多的干细胞。

2010

除了提供脐带血储存以外，康盛人生是首家提供更多干细胞储存选择的业者。

2013

首家提升至 Sepax®2 技术-全自动脐带血处理系统，以取得比以往更多的干细胞。

2015

- 首家投资使用 Smart-Max™ 系统的业者。
- 新加坡首家私营脐带血库获得两家独立的世界级脐带血协会认证 - AABB 和 FACT。



## 长期服务承诺 • 独资拥有自家的实验室

随着年龄的增长，使用干细胞治病的可能性也相对提高。<sup>17</sup> 因此，选择一家信誉卓著、可以信赖的公司，才能为您的宝宝和家人，守护这一份宝贵的资源。康盛人生信守本身的承诺，投入数百万元资金购置自用设施，并精心设计，以满足干细胞处理和储存的需要。我们深信，干细胞处理和冷冻保存是服务中的最关键部分，因此不会把这重要部分外包。本公司做出的种种努力，足以显示我们对您的宝宝干细胞的重视和用心。



## 由实力雄厚的专业医疗和技术团队 管理

康盛人生的所有医疗相关业务程序，均交由具备高度专业资格、专精于病理学和血液学的优秀医生团队打理。我们拥有训练有素、具有博士学位的技术总监和实验室团队，竭诚投入，管理好各方面的技术要求。



17. Nietfeld JJ, Pasquini MC, Logan BR, et al. Lifetime Probabilities of Haematopoietic Stem Cell Transplantation in the U.S. *Biology Blood Marrow Transplant.* 2008 March; 14(3):316-22.

## 您可信赖的品质

本公司团队对脐带血储存做法和标准具备深入专业知识，并获得以下多家世界级黄金标准和政府机构认可：



新加坡  
FACT 认证



新加坡  
AABB 认证



新加坡  
医疗器械良好的  
销售实践认证



新加坡  
卫生部  
认证



香港  
AABB 认证



香港  
ISO 9001:2004  
认证



印度  
AABB 认证



印度  
ISO 9001:2008  
认证



印度尼西亚  
ISO 9001:2008  
认证



菲律宾  
卫生部  
认证

## 与临床专家合作，让您与家人优先参与干细胞应用

康盛人生除了在干细胞储存的日常运作中力求符合全球最严格的品质标准外，我们也和全球知名的临床医生合作，携手推动干细胞的临床应用和发展。我们多方努力、毫不松懈，都是为了推动干细胞更接近临床应用，让您和您的家人能优先参与，特别是那些目前仍无法治疗的病症。

2002

康盛人生是新加坡首家发放私人储存脐带血用于兄妹移植来治疗白血病的私人脐带血库。<sup>18</sup>

2009

我们有幸与顶尖神经外科医生吴有晶医生合作，在新加坡进行首例脑瘫儿童的细胞治疗。<sup>19</sup>

2016

康盛人生目前正与来自萨特医疗集团和萨特神经科学研究院 (Sutter Medical Group and Sutter Neuroscience Institute)，自闭症和癫痫症治疗先驱者 Michael Chez 医生携手合作，为自闭症患者提供干细胞临床试验性治疗。

18. Chang, Ai-lien, Soh, Natalie. Leukaemia boy saved - by baby sister. *The Straits Times*. July 1 2004: Prime News, 6.

19. Tan, Judith. Cerebral palsy baby helped by cord blood. *The Straits Times*. November 3 2009: Home, B6.

# 康盛人生关怀360°： 360°保障您和家人

在康盛人生，我们了解作为父母的担忧与需求。这就是为什么我们设计了康盛人生关怀360°的全方位保障，以最全面的方式照顾您和您家人的健康。

## 康盛人生健保：360°<sup>^</sup>

### 给予您与您的家人无微不至的关爱

康盛人生为怀孕与分娩时可能出现的并发症<sup>^</sup>提供保障，让您和您的家人少一份忧虑，多一份安心。

## 康盛人生誓言：360°

### 我们保证处理和保存过程达到最佳质量标准

康盛人生向你保证成功配对脐带血单位，如果脐带血单位在移植时不能被使用，我们将给予\$50,000新元\*以支付医疗费用<sup>^</sup>。

## 康盛人生保障：360°

### 您和您的家人能享有的自由

康盛人生与国际保险机构联手，在您或您的配偶离世或罹患完全及永久残疾 (TPD)\* 时，豁免您将来需要支付的储存费用。根据您所选择的付款计划，您的家人可能获取象征式的善款\*。

## 康盛人生保证：360°

### 造血干细胞移植之前，保证进行测试

康盛人生会在您或家人需要使用到脐带血时，承担在进行造血干细胞移植之前需通过的测试费用：人类白细胞抗原 (HLA配型) 及集落形成 (干细胞增殖) 测试 (CFU化验)\*。这是我们为您提供保证和承诺。

## 康盛人生守卫：360°

### 守卫您和您的家人

康盛人生已购买额外保险，以保障您和您的家人遭受到金融弊端\* 的经济损失。

<sup>^</sup> 附带条件。

\* 请注意，此页信息仅属一般信息。请参阅康盛人生服务协议以了解完整的条款和条件。康盛人生集团有限公司保留修改或取消任何在此手册里所列出的利益，恕不另行通知。国际质量标准可能因机构参与时，和在移植发放您的宝宝的脐带血单位时出现更改。我们会尽所有合理的努力确保在移植发放您的宝宝的脐带血单位时，程序符合当时现行的标准。HLA 测试和 CFU 检验可能会，也可能不会成为强制性的质量检测。

# 康盛人生网络： 您的宝宝的脐带血 可给予您一家三代保障

康盛人生明白身为父母的您，并没有机会将自己珍贵的脐带血保存。这也是康盛人生通过自家的网络把您宝宝的脐带血保障延展至您一家三代的原因。

有了康盛人生网络，您现在可以通过在康盛人生储存您的宝宝的脐带血，保障一家三代。



## 如何注册康盛人生的服务？

- 1 致电 6238 0808 预约，选择在您方便的地点洽谈，或亲临我们的咨询服务台或中心，了解我们提供的服务。
- 2 在注册手续完成后，我们将给予您一套 **个人化的脐带血采集盒**。
- 3 之后，请告知您的医生。
- 4 在您到医院待产时携带此**个人化脐带血采集盒**。
- 5 在生产之后，**拨电9388 0567**联络我们。

## 常见问题



### 脐带血储存期限有多长？

科学家认为，只要根据国际标准进行妥善处理，并把脐带血的干细胞储存在低于  $-135^{\circ}\text{C}$  低温，可以无限期地储存和仍保持活性<sup>20</sup>。

### 康生人生为什么不把脐带血分开两个地点储存，以防万一？

新加坡面积不大，而且没有自然灾害，因此并没有需要把每个宝宝的脐带血都分开两个地点储存。脐带血分别装入两个冻存袋会增加污染风险，要把冷冻脐带血运往额外储存，也会提高细胞受损和被混淆的机率。其实，把脐带血分别装入多个冻存袋，并无法保证以后就能有更多干细胞可用来进行多种治疗。纽约血液中心联合创始人鲁宾斯特恩 (Pablo Rubinstein) 医生指出：“干细胞的数量是移植成功与否的重要指标，将脐带血单位分开运送储存，可能对日后需要接受移植的病患不利，并导致干细胞可能无法用以治疗。因此，除非上述做法实际上可以扩增干细胞的数量，否则我们并不建议那么做。”<sup>21</sup>

### 公共和私人脐带血库 – 选择哪一个呢？<sup>22</sup>

公共脐带血库	私人家庭脐带血库
由于是捐献的脐带血单位，所以捐献者被视为已放弃了其拥有权。	脐带血单位由私人机构为家庭保存，仅供宝宝和其家庭成员使用。
捐献脐带血不需要支付任何费用。	家庭支付处理及储存费用。
捐献的脐带血单位获得人类白细胞抗原 (HLA) 分辨测试，并列入国际捐献者记录，可供无血缘关系的公众进行移植。	脐带血单位此时无须 HLA 测试，也不会被列入任何国际捐献者记录。因为脐带血单位是仅为孩子 (自体移植) 和其家人所保存的。
如果配对成功，脐带血单位将被发放给病患使用。	脐带血单位只在家庭成员的要求下才会获准发放使用。一般情况下父母不需要支付发放费用。

20. Broxmeyer HE, Srour EF, Hangoc G, et al. *Proceedings of the National Academies of Sciences of the United States of America*. 2002; 100/2: 645-650.

21. Rubinstein P. Cord blood banking for clinical transplantation. *Bone Marrow Transplantation*. 2009; 44:635-642.

22. Parent's Guide to Cord Blood Foundation website. <http://parentsguidecordblood.org>. Accessed March 20, 2014.

## 骨髓是造血干细胞的另一个来源。我既然可以寻找骨髓捐赠者，那为何还需要储存我的宝宝的脐带血？

与寻找骨髓捐赠者相比，储存您的宝宝的脐带血干细胞有着不少优势，包括：

- 确保细胞配型吻合，适合自体移植（供者和受惠者是相同的个体）
- 储存一份随时备用的造血干细胞来源，省却在危急时才进行本地或全球搜索的成本和时间
- 因免疫系统细胞的差异，移植组织可能会攻击病人本身的组织，导致移植物抗宿主疾病。应用您的宝宝的脐带血干细胞就可降低自体移植者患上此病的风险。
- 采集过程简单快捷，对母体和婴儿都不会造成痛苦或风险
- 与脐带血干细胞相比，骨髓干细胞需要较严格的人类细胞抗原 (HLA) 配对。如果在有需要时，才在家人之中寻找‘全相合骨髓’，成功几率其实只有25%左右。然而，如果储存了脐带血，近亲就有40%的机会获取在6个位点之中有4个位点匹配的脐带血。相对于在家人之中寻找骨髓配型相合的机会来说，从脐带血中找到配型相合的几率高出60%。<sup>23</sup>

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23. Beatty PG, Boucher KM, Mori M, et al. Probability of Finding HLA-mismatched Related or Unrelated Marrow or Cord Blood Donors. *Human Immunology*. 2000; 61: 834-840.

## 使用脐带血比使用其它来源的细胞组织的优点

来源	骨髓	外周血	脐带血
采集	多次提取	多次注射生长因子	快捷、无痛、无风险
是否源于胎儿?	否	否	是
可用性	捐献者搜寻可用	捐献者搜寻可用	随时可用 (适用于家庭脐带血库)
移植物抗宿主病	高风险	更高风险	低风险, 自体移植100%成功配对
获取成功配对的脐带血单位的费用	可高达30,000美元	可高达30,000美元	家庭保有100%的受益权 (适用于家庭脐带血库)



### 今天就踏出第一步。

选择储存宝宝的脐带血是一个重大的决定。我们鼓励您尽可能在孕中期或孕后期初段时登记参与计划。然而，只要您在怀孕期间报名，我们还是愿意随时为您效劳。请在任何时候致电给我们，以安排非强制性的咨询面谈。

### 康盛人生服务, 全年无休!

康盛人生为您提供全年无休的贴心服务和支 持, 一年365天, 无论是您或您的医生, 在您怀胎时, 分娩前或宝宝出生后, 只要有疑问, 我们都竭诚候驾, 为您解答。如果您已经在产房临产, 并想签署脐带血储存配套, 请马上致电联系我们。



The opportunity to store your baby's  
cord blood only comes once in a lifetime.  
**储存脐带血，是一生只有一次的机会。**

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