

CORD BLOOD: Current uses



Cord Blood: Transplantation

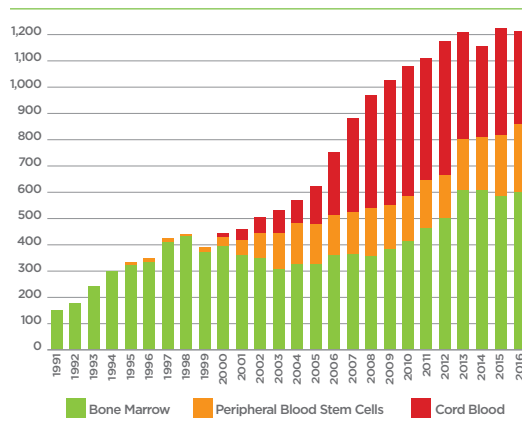
Cord Blood vs Bone Marrow:

- Improved transplantation outcomes for siblings
- Lower incidence and severity of Graft vs Host Disease
- Readily available with lower matching requirements
- Potentially faster immune recovery

Practical Advantages of Cord Blood:

- Collection is simple and non-invasive
- Painless and free of any harm to both mother and baby
- Readily available without the requirement for an unrelated donor search

Paediatric Transplants by Cell Source Worldwide¹



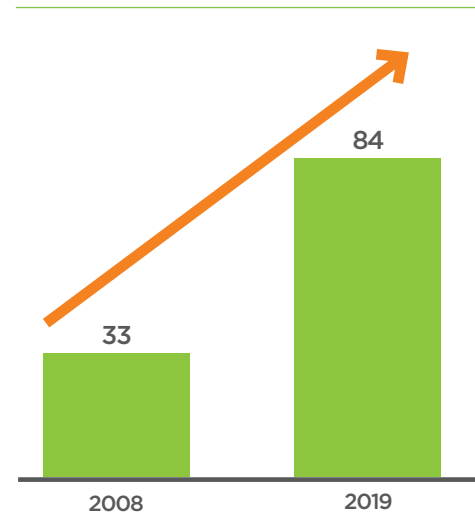
Cord Blood: Approved uses

Since the first use of cord blood as a source of haemopoietic stem cells for transplantation in a child with Fanconi Anemia in 1988², cord blood has been used in Australia and worldwide for the treatment of over 80 medical conditions. The list of conditions includes solid tumours, blood cancers like leukaemia and lymphoma, inherited metabolic disorders and deficiencies of the immune system³. The number of approved therapies continues to expand.

Current diseases treated by cord blood transplants

THERAPEUTIC AREA	EXAMPLES OF CONDITIONS	EXAMPLES OF CELL CARE RELEASES
Haematological malignancies	Leukaemia Hodgkin's Lymphoma Non-Hodgkin's Lymphoma Multiple Myeloma	Acute Lymphoblastic Leukaemia Acute Myeloid Leukaemia
Bone Marrow Failure	Severe Aplastic Anaemia Fanconi Anaemia	Fanconi Anaemia
Haemoglobin Disorders	Alpha- and Beta Thalassaemia Sickle Cell Disease	Alpha Thalassaemia Major Beta Thalassaemia
Immune Disorders	Rheumatoid Arthritis Wiskott-Aldrich Syndrome Multiple Sclerosis	Chronic Granulomatous Disease
Metabolic Storage Diseases	Hurler's Disease Krabbe's Disease	
Solid Tumours	Neuroblastoma Retinoblastoma Medulloblastoma Wilms' Tumour	Medulloblastoma Retinoblastoma Neuroblastoma Embryonal Supratentorial Tumour

Indications treatable with Cord Blood Transplants³



CORD BLOOD & TISSUE: Emerging uses



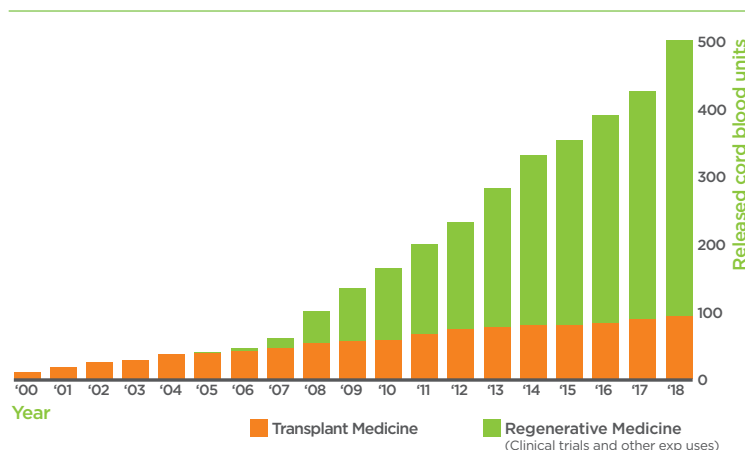
Although cord blood has been used primarily as a source of haematopoietic stem cells, recent data and observations demonstrate it is a therapeutically important source of other cell populations. These include endothelial stem- and progenitor cells and potent immune regulatory cells as well as immature immune cells⁵.

There are currently over 189 registered clinical trials underway worldwide investigating the potential of these cells to act as a regenerative treatment for an expanding and diverse list of medical conditions⁶. To date, over 2000 cord blood units have been released from private cord blood banks for regenerative medicine applications⁸. This list includes releases from Cell Care for use in Australia's first clinical trial of cord blood infusion as a possible treatment for cerebral palsy and type 1 diabetes.

Regenerative medicine applications using cord blood⁷

EXAMPLES OF CURRENT REGENERATIVE MEDICINE APPLICATIONS/RESEARCH	EXAMPLES OF CELL CARE GROUP RELEASES
<ul style="list-style-type: none"> • Cerebral palsy • Type 1 Diabetes • Brain and spinal cord injury • Autism • Acquired Hearing Loss • Skin Repair • Bone and Cartilage Repair • Stroke • Autoimmune Disorders • Alzheimer's Disease • Lung injury • Cardiac Indications • Critical Limb Ischemia • Bronchopulmonary Dysplasia 	<ul style="list-style-type: none"> • Cerebral palsy • Type 1 diabetes • Brain injury • Autism

Increasing use of cord blood for emerging regenerative medicine applications – Private banks⁸



Cell Care Group's ongoing research investments

Cell Care continues to actively invest in research and clinical trials to advance the therapeutic potential of cord blood and tissue stem cells. The table below outlines some examples of Cell Care's ongoing research and clinical trial investments.

TITLE	BRIEF DESCRIPTION
Type 1 Diabetes study	Autologous cord blood reinfusion in children at high risk of developing type 1 diabetes
Cerebral palsy study (CP)	Study of sibling cord blood infusion to children with cerebral palsy
CB expansion for Neurological Indications	Development of a UCB culture method to maximise expansion and expression of neurotrophic, angiogenic and anti-inflammatory factors
Sibling Cord Blood for CP; Collection program	Free collection of sibling cord blood for families with a child who has cerebral palsy
Sibling Cord Blood for Haematological Malignancy; Collection program	Free collection of sibling cord blood for families with a child who has a haematological malignancy
Induced Pluripotent Stem Cells (iPSCs) from cord blood and tissue	Generation of induced pluripotent stem cells from cord blood and cord tissue

1. National Bone Marrow Donor Program/Be the Match FY 2017 2. A. Dahlberg and F. Milano. Cord blood transplantation; rewind to fast forward. Bone Marrow Transplantation (2016) 1-4 3. <https://parentsguidecordblood.org/en/diseases>, www.nationalcordbloodprogram.org/patients/utilization_outcomes.html in Feb 2019 4. Bioinformant: Complete 2017-18 Cord Blood Banking Industry Report www.Bioinformant.com, March 2018 5. Roura, 5. Roura, S. et al. The role and potential of umbilical cord blood in an era of new therapies: a review Stem Cell Research and Therapy (2015) 6:123. 6. 106 CB updated March 2019; 83 CT, updated Oct 2017 7. Ballen, K.K. et al. Umbilical cord blood donation: public or private? Bone Marrow Transplantation (2015) 1-8 8. www.nationalcordbloodprogram.org/patients/utilization_outcomes.html in Feb 2019