

every day, stem cells
save lives



National
Stem Cell
Foundation
of Australia

Stem cell medicine is already transforming lives. Tens of thousands of people benefit each year from stem cell transplants (as bone marrow transplants) to treat blood cancers such as leukaemia and lymphoma and non-malignant disorders like thalassaemia. Stem cells are amazing.

Not only do stem cells save lives every day, but their unique capabilities mean researchers are using them to find new ways to treat diseases that today cannot be cured. Why are stem cells unique? Some stem cells called “pluripotent” stem cells have not yet developed into specific cells that perform a function, i.e. blood cells, or an organ in the body, like new skin. They retain the ability to become any of many different cell types depending on the signals they receive. Once they have become specific tissue cells they are called ‘adult’ stem cells.

What this means is we can potentially programme pluripotent stem cells to become adult stem cells - that can repair or replace damaged or diseased cells in the body.



where do stem cells come from?

You. In fact, you've got stem cells inside you right now. They were with you before you were born. They're part of your hair, skin, gut, bone marrow, as well as brain, joints, muscles, to name a few – although they are rare cells in these organs. As you grow, stem cells generate new tissue and once you stop growing, they renew your damaged and ageing tissues. We have a lot to thank them for. Nowadays many scientists can create stem cells by reprogramming or “inducing” adult cells to act like stem cells. These are called ‘induced’ pluripotent stem (iPS) cells, and iPS cells are often used in stem cell research.

today's hope, tomorrow's cure

Key areas of research for stem cell medicine include spinal cord injuries, heart disease, diabetes, Parkinson's disease, and arthritis. Researchers are also making headway into new approaches for curing cancer (leukaemia) and multiple sclerosis. Besides this, stem cells enable scientists to study how illnesses are caused. For example, iPS cells can be derived from patients with genetic and other diseases so we can study those diseases and better understand them to guide development of more precise diagnoses, find new more effective treatments, and submit them to clinical trial.

exciting breakthroughs

We grew a kidney!

Researchers in Australia have successfully grown a miniature kidney in a dish using stem cells. Researchers created the several cell types required and prompted them to 'self-organise' into a functioning, mini-kidney. This is just the start, as stem cell sciences join forces with material sciences and biomedical engineers to further develop the technology that will provide structural scaffolds for cells, and ultimately allow the creation of tissues for transplantation, to save lives.

We will be repairing eardrums in the future!

Researchers have found that the unlikely combination of silk and stem cells could be the key to restoring hearing for people with damaged eardrums. Very promising discoveries continue to be made.

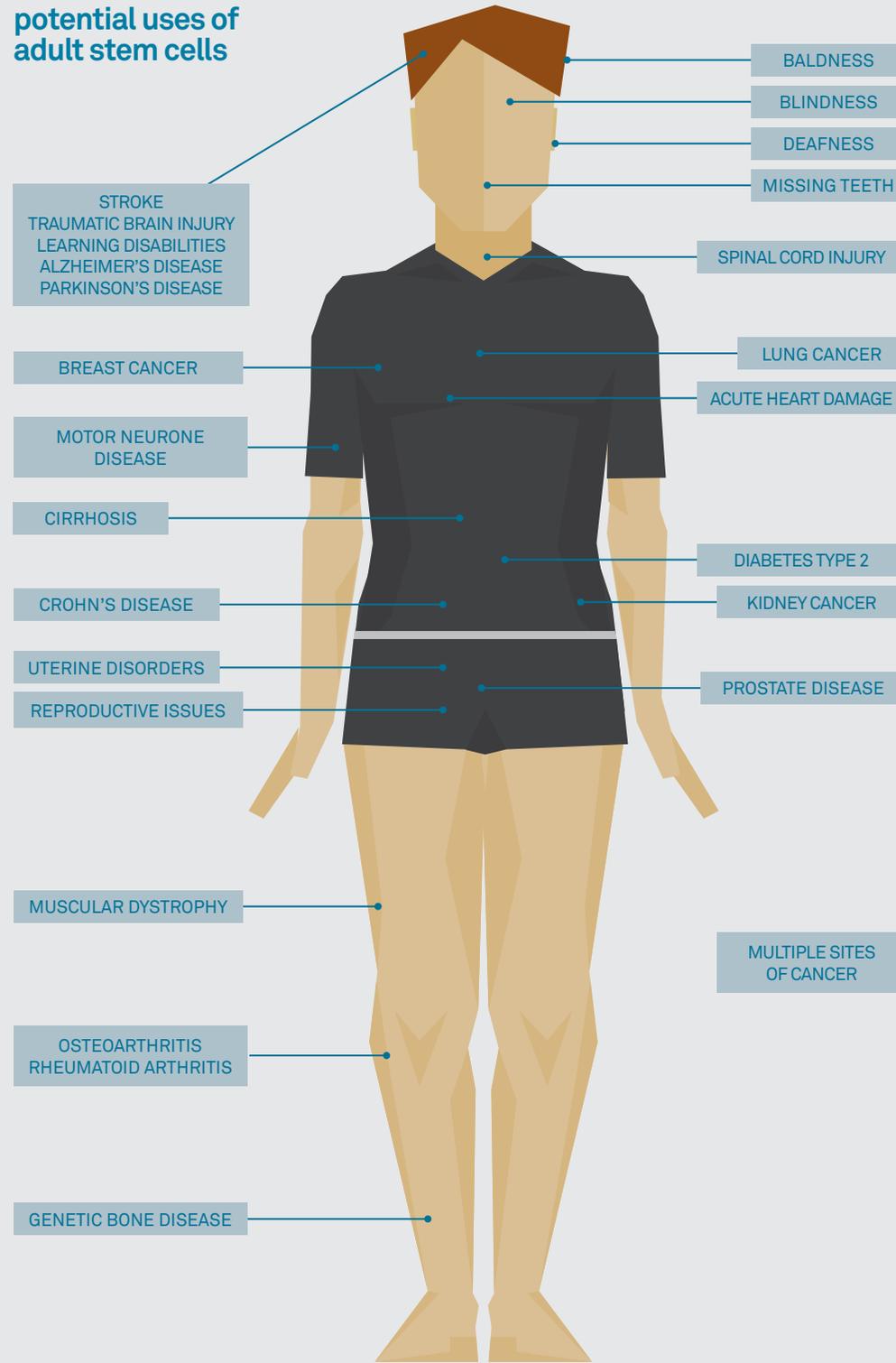
Arthritis sufferers rejoice!

Stem cells may one day repair joint cartilage – the shock absorbers of the human body. Cartilage is notoriously slow to repair, much to the frustration of injured athletes and osteoarthritis sufferers alike. A team of researchers are trialling the use of stem cells derived from bone marrow to produce cartilage and bone 'micro-tissues,' suitable for cartilage repair.

But wait, there's more!

Stem cell medicine will save more lives and treat a greater variety of conditions in the future. Check out this nifty diagram on the potential uses of stem cells.

potential uses of adult stem cells



a real life story

Brave young twin brothers, Jared and Connor McCartin, from Victoria are only the second set of identical twins in the world to be diagnosed with the life threatening Juvenile Myelomonocytic Leukaemia disease at the tender age of 13 months. This is an aggressive cancer in which abnormal blood cells grow in the bone marrow, slowly destroying the body's ability to form normal blood cells, and the body's defences against infection.

Unlike the commoner acute lymphoblastic leukaemia occurring in childhood which is usually cured with chemotherapy, this form of leukaemia is curable only with a bone marrow stem cell transplant. Thanks to the discovery that umbilical cord blood contained the stem cells needed, and the establishment of an Australian Network of Cord Blood Banks in the 1990's, suitable donor units were quickly identified. After several courses of intensive chemotherapy both boys underwent life saving Cord Blood transplants. Overcoming significant post transplant problems the boys are now healthy, mischievous schoolboys, having been given a second chance of leading long, fulfilling lives.



to stem cell or not to stem cell?

Are you considering stem cell treatment? Medical experts and stem cell scientists are increasingly alarmed by 'Stem Cell Tourism', which is when people travel overseas to receive unproven "stem cell" treatments. Worryingly, some unproven stem cell treatments are also now being offered in Australia. Such treatment clinics target vulnerable patients looking for the hope of a cure. These clinics often

over-promise and under-deliver, while charging patients tens of thousands of dollars.

Many "stem cell" treatments offered are unproven and do not have rigorous scientific evidence behind them, nor have they been clinically trialled and proven.

In Australia, we are working as fast as we can to support researchers to deliver

viable and proven stem cell treatments from local medical institutions. In order to do this, our Foundation needs further funding to support research into these new areas of stem cell science, to ensure new treatments can be safe, effective, and accessible to the Australian public.

If you're considering stem cell treatment, our website has some vital information to

consider. Check out the details under "Treatment Information" where you'll find the Australian Stem Cell Handbook, with information on stem cell treatments, checklists, and links to global resources on treatments and clinical trials, so you can make an informed decision.

www.stemcellfoundation.net.au



National Stem Cell Foundation of Australia

who we are

We are the National Stem Cell Foundation of Australia (NSCFA). Established in 2011, the Foundation is led by an expert board with diverse backgrounds in stem cell science, medicine, and finance.

We support the development of new treatments using stem cells for currently incurable diseases. In 2014 we launched the Metcalf Prize, a major Australian Science award that invests in stem cell

science and researchers. We have funded researchers at the Royal Eye and Ear Hospital, to further their work in providing stem cell treatment for blinding eye diseases.

We consult with leading stem cell scientists, as a not-for-profit dedicated to providing you with objective and reliable information about the potential risks associated with stem cell treatments.

Every year we fund stem cell researchers to attend national and international research meetings. We're banding together and building a community of like-minded people with an interest in supporting this innovative science. Could this be you?

Read on.

www.stemcellfoundation.net.au

I'd like to know more information about Stem Cell Research, the Foundation and how to donate.

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