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Cryopreserved human haematopoietic stem cells retain engraftment potential after extended (5-14 years) cryostorage.

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Harvesting of stem cells during the early phases of treatment with no immediate intention to perform a stem cell transplant is becoming an increasingly common practice. Such "insurance" harvests are often stored for many years before being needed for transplant in a subsequent relapse. The effect of long-term cryostorage (5-14 years) on the viability and functional capacity of haematopoietic stem cells (HSCs) was investigated in 40 bone marrow and peripheral blood harvests using standard in vitro methods, the colony forming unit-granulocyte/macrophage (CFU-GM) assay and a single platform viable CD34(+) cell absolute count by flow cytometry. Forty percent of harvests had CD34(+) HSC counts of at least 0.7 x 10(6)/kg bodyweight and 85% had CFU-GM counts of at least 1.0 x 10(5)/kg bodyweight, these values representing our institutional minimum requirements for safe transplantation. Based on these results, it appears that HSC collections can remain adequate for safe transplantation after up to 14 years of cryostorage. However, as deterioration of HSC quality and viability may occur, some precautions may be warranted, namely harvesting higher than normal numbers of HSCs in collections intended for long-term storage and repeating in vitro assays on harvests after long-term storage prior to transplantation.

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