

Opinions regarding cord blood use need an update

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The recent Perspective by Sullivan (Sullivan, M. J. Banking on cord blood stem cells. *Nature Rev. Cancer* 8, 555–563 (2008))¹

states that information on cord blood (CB) banking that is provided for parents “needs to be scientifically accurate.” Unfortunately, the Perspective has numerous inaccuracies.

In this Correspondence I focus on two points. First, Sullivan cites 16 publications that give negative opinions about the value of private CB banking, including the opinions of several highly respected societies and institutions (see BOX 2 in the Perspective). Those opinions are mainly based on the belief that the probability that a privately stored CB unit will be used for an autologous (or allogeneic sibling) transplant is extremely low. In most cases the presented probabilities are unsubstantiated, the one exception being the data calculated by Johnson². However, his paper is outdated by the recent publication of Nietfeld *et al.*³ (not mentioned by Sullivan). They performed the first calculation of the lifetime probability that a person has to undergo a haematopoietic stem cell transplant (HSCT). The result of almost 1:200 is much higher than commonly appreciated. Therefore, opinions regarding CB use need an update.

Second, in Sullivan's reanalysis of CB use it is not explained why CB transplants should be limited to those 0–14 years of age. It is also not clear why autologous transplants for central nervous system tumours and sarcoma were not included. They constitute a considerable percentage

of the autologous transplants in those up to 20 years of age³.

The conclusion of the reanalysis “that the chance of using a cord blood sample for an autologous transplant is no better than 1:15,000” (calculated for neuroblastoma) and “almost certainly considerably less” (because of the lower probabilities calculated for other diseases) is erroneous. The overall probability is not a kind of average of the transplant probabilities calculated for each disease but results from the addition of those probabilities.

TABLE 1 shows that if Sullivan had performed that addition and had included central nervous system tumours and sarcoma, he would have found an overall probability of 0.0145% to need an autologous HSCT for those 0–14 years of age. That is fully in agreement with Nietfeld *et al.*, reporting a probability of autologous HSCT of 0.01% for 0–10 years of age and 0.02% for ages 0–20 (REF. 3).

Therefore, expecting parents should be informed of several points. First, that the probability of undergoing an HSCT is much higher than others believed^{4–7}. Second, that the quality of CB cells has been maintained over a 15-year period of cryogenic storage⁸ and that in cryobiology there are no reasons why this would not also be the case for a lifetime⁹. Third, that stem cell expansion technology¹⁰ could solve the problem of there being too few cells in a CB unit and has maybe already solved it¹¹ and, if not, improvement of harvesting technology¹² could bring the solution for transplanting an adult with a

single CB unit. Fourth, that research and clinical trials in areas such as neurological disorders¹³ (NCT00593242) and diabetes¹⁴ (NCT00305344) show the developments in the direction of autologous CB treatments for diseases that have a much higher incidence than those requiring haematopoietic reconstitution. Fifth, the number of children who have received autologous CB treatment is more than 60 to date¹⁵.

When receiving more complete and up-to-date information, expecting parents will be able to make a sounder decision regarding whether to store the CB of their baby in a private family bank (after birth) or to donate it to a public bank.

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Table 1 | Addition of probabilities of stem cell transplants in children up to age 14

Disease	Frequency	Probability (%)
Neuroblastoma	1 in 15,000 (REF. 1)	0.0067
Lymphoma	1 in 50,000 (REF. 1)	0.0020
Aplastic anaemia	1 in 200,000 (REF. 1)	0.0005
Subtotal	–	0.0092
CNS tumours*	–	0.0035
Sarcoma†	–	0.0018
Total	–	0.0145

*53% of the neuroblastoma value³. †27% of the neuroblastoma value³. CNS, central nervous system.