Assessment of Cord Blood Product Viability for Application in Cord Blood Banking and Transplantation. HS Goodwin, DM Regan, DA Oliver, JMF Alonso III, DA Wall. St. Louis Cord Blood Bank at Cardinal Glennon Children's Hospital/Pediatric Research Institute, Saint Louis University, St. Louis, MO, 63119.

With cord blood units being stored for long periods of time prior to use in transplantation, concern has been raised as to whether products maintain viable hematopoietic stem cells (HPC). While we have not noted any difference in engraftment of units frozen for up to 4 years, it is probable that over time older units will be considered for transplant and product viability will be questioned. This is especially important in banks were inventory may be exposed to conditions outside of liquid nitrogen.

At the St. Louis Cord Blood Bank, cord blood is cryopreserved in 10% DMSO/ dextran in Cryocyte bags (Baxter) using controlled rate freezing. A contiguous segment of tubing is sealed, containing approximately 40 μl of cord blood product. It is bank policy to repeat molecular HLA typing on the product to confirm identity prior to release. Using 11 research cord blood units we assessed the viability of cord blood units that had been stored for varying lengths of time (42 to 1060 days), comparing colony forming units and trypan viability of the cord blood unit and the contiguous segment. For the trial, the contiguous segment was removed from the bag, thawed and aliquoted for HLA typing, trypan blue viability and CFU analysis. Then the entire cord blood product was thawed/washed and an aliquot analyzed for trypan viability and CFU. In 7/7 cords HLA typing was successfully performed. We noted a correlation of R= 0.91 between the CFU measured on the unit and that of the segment. Trypan viability was uniformly high – in fact a product that had been thawed overnight and refrozen had trypan viability of 68% with no CFU growth.

	Unit CFU/10^5 cells	Segment CFU/10^5 cells	Unit:Segment CFU Ratio
Median	37	22	0.8
Minimum	7	6	0.2
Maximum	131	157	3.7

We conclude that trypan viability of the segment may be misleading. CFU quantitation of the segment correlates with that found in the product and can be successfully performed on the contiguous segment at time of confirmatory HLA typing. This quality control tool will now be tested prospectively in cord blood units being used in transplantation from our bank.