Impact of increasing minimum cell dose on cord blood banking operations – Experience at the St. Louis Cord Blood Bank

DM Regan, JM Alonso III, CE Johnson, DA Wall. Dept. of Pediatrics,
Cardinal Glennon Children's Hospital/Saint Louis University, St. Louis, MO

In umbilical cord blood (UCB) transplantation, engraftment time correlates directly with cell dose/CD34 content of the infused cord blood unit. Thus the ability of a cord blood bank to provide larger cell dose cord blood units is important. At the St. Louis Cord Blood Bank, we have sequentially increased minimum total nucleated cell count (TNC) and cord blood volumes required for banking in an attempt to supply cord blood to a larger segment of the transplant population. Here we present the impact of increasing this minimum standards for banking on the number of cords that need to be collected to support such a banking approach.

Time period	Minimum banking criteria	% of collected cords banked
01/96-07/96	Vol 40 ml TNC 600 x 10E6	48% 200/389 collected
08/96-10/97	Vol 40 ml TNC 700 x 10E6	39% 1857/5030 collected
11/97-06/99	Vol 50 ml TNC 800 x 10E6	24% 2164/9049 collected

With this banking approach all cord blood units contain >700 x 10E6 TNC (90% post processing recovery) which provides a minimum cell dose for transplantation of at least 1 x 10E7 for all patients under 70 kg. The mean TNC for banked cords is 1156 x 10E6 for cord units banked with the current strategy. While this approach results in a bank more accessible to larger patients the impact to the banking operation is significant – resulting in banking of only 25% of collected products.

Time period	Minimum banking criteria	% of collected cords banked
01/96-07/96	Vol 40 ml TNC 600 x 10E6	48% 200/389 collected
08/96-10/97	Vol 40 ml TNC 700 x 10E6	39% 1857/5030 collected
11/97-06/99	Vol 50 ml TNC 800 x 10E6	24% 2164/9049 collected

Table 1: Cord Blood Processing Technique:

- Assign consecutive barcode label to collection, etc.
- Check completeness of paperwork and compare with labels on unit and accessory specimens
- Weigh unit; proceed if > 50 ml

1) Remove preprocessing samples

- Run CBC; proceed if > 800 x 10e6 TNC
- Add hetastarch in calculated volume 1:5 v/v
- Incubate at 4°C for 45 minutes

2) Spin in inverted position at 50 x g, 4°C, for 5 min
3) Decant (drain) calculated volume of red cells
4) Spin upright at 420 x g, 4°C, for 13 minutes

- Express plasma

5) Remove samples
6) Draw into syringe
7) Add with DMSO to freezing bag
8) Freeze at controlled rate

you may want to flush this out a bit