

Preface

The first transplantation using umbilical cord blood (UCB) was performed in 1989; the transplant was performed with an international collaboration led by Dr. Eliane Gluckman and colleagues in Paris for a child with Fanconi anemia. Since then, over 30,000 umbilical cord blood transplantations (UCBT) have been performed worldwide, and over 600,000 UCB units have been donated for public use. The first UCBT were given to children, but with a better understanding of the importance of cell dose, UCBT were extended to adults. UCB is an important graft source for the seventy percent of patients who do not have a matched sibling donor, and especially crucial for racial/ethnic minority patients who have a difficult time finding a matched unrelated donor. UCBT outcomes have improved over the last twenty-five years, with exciting advances in cord blood expansion, homing, and double UCBT. However, several challenges remain including poor immune recovery, contributing to a high rate of infections.

In this volume, we explore the regenerative potential of UCB, including applications in neurologic and cardiovascular disease. In the sections of UCB banking, the authors discuss quality control in UCB banking, the use of maternal human leukocyte antigen (HLA) typing, and methods to measure UCB potency. In the sections on pediatric UCBT, we review results in hematologic malignancies, non-malignant hematologic disorders, and metabolic storage diseases. Data on adult UCBT in Europe, Asia, the US and the Middle East are presented. An in-depth understanding of immune recovery after UCBT is essential to preventing and treating infection, and two chapters are devoted to this topic. Expansion of UCB, improvement of UCB homing, intra-marrow injection of UCB, and combinations of UCB with other graft sources are novel strategies to improve UCBT outcomes. Finally, we compare results from UCBT with outcome data from haploidentical, related and unrelated donor transplants, and we compare outcomes between single and double UCBT and explore selection of the optimal cord blood unit.

Much has been accomplished in the field of UCB banking and transplantation, and the next five years should be exciting ones indeed!

Umbilical Cord Blood Banking and Transplantation

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