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### All Cord Blood Banks Are Not the Same: Private and Public Facilities

Announcer:

Welcome to CME on ReachMD. This activity titled: *All Cord Blood Banks Are Not the Same, Private and Public Facilities*, is provided in partnership with Omnia Education and supported by an independent educational grant from CBR, a California Cryobank Company.

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Here's your host, Dr. Prathima Setty.

Dr. Setty:

The use of umbilical cord blood stem cells has increased significantly over the past two decades with cord blood being used today to treat many life threatening diseases. This interview will provide an overview of the scientific unpinning of cord blood and focus on the practical issues surrounding public versus private banking.

This is CME on ReachMD, and I am Dr. Prathima Setty. Joining me today is Dr. Jordan Perlow, Clinical Professor at the University of Arizona College of Medicine and Banner University Medical Center in Phoenix, Arizona.

Dr. Perlow, welcome to the program.

Dr. Perlow:

Thank you for having me.

Dr. Setty:

Dr. Perlow, can you please review the concept of umbilical cord blood banking and the science that supports this option in pregnancy care?

Dr. Perlow:

With pleasure. I think the best way of answering that question is to point out that what we are talking about is not necessarily anything brand new. In other words, it has been recognized for about three decades now that the remaining blood within the placenta and the umbilical cord following the delivery of a child has been recognized as a rich source of hematopoietic stem cells. The stem cells that have the ability to regenerate and differentiate into the various components of the blood and the immune systems including cells such as erythrocytes, leukocytes and platelets. And more recently, it has been found that the Wharton's jelly, itself, of the umbilical cord is a rich source of even less differentiated stem cells known as mesenchymal stem cells which may have therapeutic applicability themselves.

Dr. Setty:

What types of conditions are currently treated with umbilical cord blood stem cells?

Dr. Perlow:

Well, over the years, there has been an accumulation of the different types of diseases so treated, and while more than 80 different life threatening medical conditions have been treated with umbilical cord blood stem cells, the primary conditions that are managed

therapeutically in this specific manner include the hematological malignancies, for example, of leukemia and lymphoma, as well as myelodysplastic syndrome, anemias such as Fanconi's anemia and aplastic anemia, and immunodeficiency syndromes, as well as hemoglobinopathies, conditions that many obstetricians are aware of in caring for their patients on a day-to-day basis, patients with thalassemia and sickle cell anemia. Even inborn errors of metabolism, clearly rare conditions but very debilitating, conditions such as Hurler's syndrome, for example, have been successfully treated in this manner resulting in improved phenotypic as well as neurologic status for these children. Truly remarkable results have been reported in this particular modality of treatment. Successful transplantation and engraftments have occurred among both adults as well as children, and to date, it is estimated that there have been more than 35,000 cord blood stem cell transplants that have occurred worldwide since the very first transplant, which took place in 1988. An excellent reference regarding a complete listing of diseases currently being treated and under investigation can be found at the website: [parentsguidecordblood.org](http://parentsguidecordblood.org).

Dr. Setty:

So, Dr. Perlow, what are the hot topic areas of cord blood stem cell research which may have practical applicability to treating other clinical conditions?

Dr. Perlow:

Well, this is an exciting area, to say the least, and while studies have been ongoing and improving outcomes for the traditional diseases treated with cord blood stem cells, those conditions that I mentioned in the previous question, there is great excitement that new avenues of research have emerged in the area of what is called Regenerative Medicine. A multitude of early-stage human clinical trials using umbilical cord blood as well as umbilical cord tissue from the cord itself have taken place and are occurring presently, and these are studying the impact of these stem cell therapies on more common conditions, chronic illnesses, conditions such as type 1 diabetes, acquired hearing loss, autoimmune disorders, including lupus, various cardiovascular diseases and even for the treatment of stroke, hypoxic ischemic encephalopathy, certainly a condition of great importance to obstetricians. Other conditions include cerebral palsy and autism, and there is even a study looking at determining the benefits of umbilical cord blood mesenchymal stem cell treatments on the condition that occurs in prematurely born newborns, that being bronchopulmonary dysplasia. So, there is over 200 clinical trials at the present time looking at these other conditions, looking at both safety as well as efficacy, and this is where there is, I believe, great excitement in looking forward to the completion and ongoing nature of many of these studies with the hope that we can then expand the use of umbilical cord blood stem cells and cord stem cells to the treatment of a wider variety of conditions including those conditions that are occurring with greater frequency.

Dr. Setty:

If you are just tuning in, you are listening to CME on ReachMD. I am Dr. Prathima Setty, and with me is Dr. Jordan Perlow, for a discussion about cord blood banking. Now that we've covered the science of cord blood, let's turn to the banking aspect. What options exist for our patients when it comes to banking the cord blood at the time of delivery?

Dr. Perlow:

Well, the way I look at this, I kind of divide the options down essentially to 1 of 3 choices. There, of course, is the option to bank umbilical cord blood and/or cord tissue in a family bank, which means that the cells that are processed and preserved at that bank remain available to the family who places them there should a potential need arise. Another option would be to donate the cord blood to a public cord blood stem cell bank, and if the cord blood sample is deemed acceptable and then cryopreserved, it becomes available to anyone in need who is an appropriate match. They would then have access to this lifesaving resource. And lastly, although the least desirable option, would be to dispose of the cord blood following delivery of the child as medical waste.

Dr. Setty:

What are some key elements to include in counseling patients regarding cord blood banking options?

Dr. Perlow:

Well, I think that the most important point to bring out at first is that we don't want to look at cord blood any longer as medical waste, that it is too valuable of a resource. So I try to emphasize that to my patients because the other two options of either public donation of cord blood or family banking, I believe are far more beneficial. In providing this information to patients and despite the excitement from encouraging results of early clinical trials, promise of cord blood stem cells in the areas of regenerative medicine must be looked at as yet not proven. And thus, although there is great excitement and hope in these areas, realistic counseling must be provided to our patients. Our patients should be encouraged to donate cord blood whenever possible, if they do not plan to bank with a family cord blood bank. I also believe that parents should be aware that public donation typically precludes their access to the stem cells should a need arise. So what I have found over the course of counseling many, many patients over many, many years now, is that they seem to be under the impression that if they donate to a public bank, that sample would be readily retrievable for their family should a need arise, and that simply does not appear to be the case.

Furthermore, regarding family banking, patients should be aware of the costs involved and be encouraged to do research on different cord blood banks focusing on a number of issues that I think speak to the quality of the bank that is being looked at for family banking, such as the length of time that particular family bank has been in operation, the numbers of samples stored and the numbers of units that have been successfully released for therapeutic use. I think those are reasonable variables for our patients to be aware of as they do their own research to determine the best family bank that may be suitable to their purposes.

Dr. Setty:

In closing, can you please review for us the practical concerns regarding cord blood collection technique and are they different for private banks versus public banks?

Dr. Perlow:

Well, I think that in terms of practical concerns and, perhaps, taking a step back to the previous question, I think that it is absolutely critical that when patients are seen for prenatal care, that a thorough personal and family medical history are taken and a genetic history, and by obstetricians becoming familiar with the conditions that are treated with umbilical cord blood stem cells, this then provides an opportunity to make a determination of whether such stem cells may be helpful to this particular patient or a family member, and under that circumstance, that family can be directed to a family bank that offers a program that allows for the cryopreservation of cord blood, cord tissue stem cells for the potential treatment of the condition that has been identified.

The other main practical points regarding proper collection of cord blood for banking purposes really comes down to obtaining the largest quantity of blood possible under the most sterile conditions possible. The largest volume of cord blood will provide the highest quantity of stem cells, and that highest quantity of stem cells is what has been clearly associated in the literature with improved engraftment and overall improved outcome among patients that undergo cord blood stem cell transplantation. Delayed umbilical cord clamping for 30 to 60 seconds, as recommended by the American College of Obstetricians and Gynecologists, may reduce cord blood collection volume. And thus, our patients should be counseled as to the benefits of delayed cord clamping and the potential for a lower volume sample to be collected, and thus, discarded by a public cord blood bank given the strict criteria that they have for accepting cord blood samples into public banks.

Family banking, however, places no specific minimum cord blood volume parameters, precluding such banking, however, again, lower volumes in this setting may compromise potential use, and patients need to be aware of the pluses and minuses in this regard.

Another critical point that is clearly practical, that I would like to share, is that at no time should cord blood collection take priority over the needs of the mother or the newborn who always remain our top priorities.

Dr. Perlow:

At the same time, I believe it is also important to allow our patients to have a sense of understanding of the actual physical process that goes into cord blood collection if they are planning this. And one of the things that I have found in discussing with patients the process of umbilical cord blood collection for banking purposes, is how that might affect the timing of delivery or, perhaps, the ability of the mother to be with her child following the delivery itself. And I think it's one of the one time, one moments, where we can actually say that the procedure itself does not interfere in any way, shape or form to any measureable degree, with any aspect of care, typically. For example, the collection is obtained after the baby is born, so the baby is delivered, there is a period potentially of delayed cord clamping of 30 seconds, the cord is doubly clamped, the cord is cut, the baby is either provided to the mother or taken to the baby warmer depending upon the clinical status of the baby, as directed by the pediatric team that would be present at the time of delivery. And it's only at that time that we would begin collecting umbilical cord blood for the process of processing and banking and ultimately cryopreservation. So, the baby is already delivered. There is no risk to the mother in doing the procedure itself. There is no risk to the baby, and so, I think once patients have a good sense of clarity that the baby is already disconnected from the cord, the baby has been delivered and can be in the arms of the mother or another parent, or family member, there is less resistance to cord blood banking procedures given the timeline at which that ultimately happens in the course of childbirth.

Dr. Setty:

Well, I very much want to thank Dr. Perlow for discussing both the science behind cord blood as well as the issues surrounding both public and private banking.

Dr. Perlow:

Thank you.

Announcer:

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