

# The Vows of Ten Million People The Guardians of the World

Speech by Dr. Jeffrey Chell

Edited by Su Chi Long

Translated by Kelvin Chen



Bone Marrow registrations reached 10 million at the start of November 2005. This joyful achievement is the culmination of efforts over 20 years by 62 bone marrow data banks in 48 countries around the world, creating a new record in medical history. While rejoicing that more and more people are joining in this endeavor, we must not

forget that much work still needs to be done.

## A Transplant That Changed Two Lives

In recent years, more and more data banks have joined international participation, with support from the Bone Marrow Donors

Worldwide (BMDW) international network headquartered in Leiden, Holland.

The mission of National Marrow Donors Program (NMDP) is to develop novel stem cell research in order to prolong and improve quality of lives for all. Our work is not limited to bone marrow matching, fund raising, and maintaining a network between donors and recipients; we strive to inform all patients of the newest advancements in the field of stem cell research.

Shown on the NMDP emblem, one can observe a hand bringing the light of hope to another, symbolizing the transformation of two lives through one single transplant procedure. While stem cell transplants bring hope to Leukemia patients, they also give new meaning of life to the selfless donors.

Despite the joint effort of data banks around the world, there remain many regions, such as Africa and Middle East, where donor registrations are still insufficient, resulting in needless loss of lives.

### **Peripheral Blood Transplant Exhibited the Greatest Increase in United States**

According to statistics from 1997 through 2004, 7200 transplants were performed. Among the stem cell sources, peripheral blood stem cell has shown the greatest increase. On the other hand, bone marrow stem cell transplantation has shown minor decline.

Although no good statistic is available to show that peripheral blood stem cell transplants perform better than bone marrow stem cell transplants, nonetheless, the stem cells used are increasingly leaning toward the use of peripheral. 2700 peripheral transplants were performed in 2005 alone, and it is expected to reach 3000 in 2006.

The five major causes of transplant in the U. S. are: Acute Myeloid Leukemia (AML), Chronic Myelogenous Leukemia (CML), Acute Lymphocytic Leukemia (ALL), Myelodysplastic Syndromes (MDS) and Non-Hodgkin's Lymphoma (NHL). Among these, CML cases are decreasing due to the Klybeck procedure used<sup>1</sup>. However, AML, MDS, and NHL cases are increasing.

In the last two years, reduced-intensity conditioning regime and small sectional transplant began to be more widely used, giving doctors and patients in the U. S. more confidence in transplantation. Furthermore, medical communities in the U. S. are also promoting the use of non-destructive treatment, allowing older and weaker patients to receive transplants. For example, before year 2000, patients over 45 year of age were not qualified for transplant. Now even 70 or 80 year old patients are able to receive transplants.

Note: <sup>1</sup> Klybeck procedure began human testing in 1999. It was approved as the CML standard procedure in 2001. Because the Klybeck procedure effectively controls CML, it gradually reduced the need for transplants.

Dr. Jeffrey Chell was tour-guided the wards in Buddhist Tzu Chi General Hospital in Hualien.



### **In U. S., Finding Matches for Acute Leukemic Patients In 21 Days At U.S.**

Our data bank use adequate time to assist non-acute and younger patients with finding their best matches. The process takes about 120 days, from matching till transplantation. However, the process is shortened for acute patients. Since 2001, under a new process, NMDP was able to reduce the time from 120 days to 21 days. That is, a reduction from 4 months to 3 weeks.

Since its initiation, NMDP has helped complete 22,500 cases of transplantations. Current sources of stem cells are: 30% from bone marrow, 10% from cord blood, and 60% from peripheral blood stem cell. Cord blood is getting increasing attention from transplant surgeons. About a year and a half ago it accounted for only 3% of the total, but by 2004 it has increased to 10%. From July to November of 2005, it has increased to 15%. We foresee that in 5 years, the use of cord blood would account for over half of all transplants, becoming the major source of stem cells.

A donor from northern Taiwan came to Hualien for bone marrow donation, smiled shyly and posed a sign of victory.



### **International Cooperation Has Increased Data Bank Sources, Therefore Accommodated Needs of Different Races**

America is a melting pot of world races. The continued increases of immigrants have expanded the gene pool, and increased the need for stem cells of close relatives to meet the needs of this diverse gene pool. Therefore, we have established links with marrow data banks around the world, and readily to obtain stem cells when necessary.

Of all the cases handled by NMDP, about 30% involved international donors or recipients.

Currently through this international network, we have contacts with 10 million potential adult bone marrow donors and 250,000 cord blood donors

### **Majority of the 40,000 Leukemic Patients Seek Donors In the U.S.**

In 2004, total requests combined from the world marrow data banks reached 24,000, requesting for matches; 73,000 requests

international assistance. In America, 40,000 Leukemia patients are diagnosed annually. Some choose to receive chemotherapy, third of the patients received donation from relatives and the remaining are left to approach NMDP seeking stem cell donors. The requests increase every year, it already has reached 11,000 cases.

Statistics show that in 2004, 4961 transplants were performed around the world. Among these, 2754 cases used stem cell sources outside their own countries. This is more than half of the total, indicating blood antigen HLA matching goes far beyond national borders. 2754 Leukemia patients owed their lives to some foreigners they didn't even know. This is the evidence that international marrow donation is becoming increasingly popular and important. Coincidentally in 2005, NMDP received 531 cases of stem cell donations from overseas, while sending exactly the same number of stem cells abroad --- such a perfect ratio.

### **Tzu Chi Exports Love**

Among the numerous marrow data banks, only a few focuses on exporting stem cells abroad, including the Tzu Chi Bone Marrow Data Bank; another is Netherland. These unique data banks serve not only local needs, but also needs from overseas. In 2004, Taiwan did not import any bone marrow stem cells, only exported them. Frankly, Taiwan already has 33 cases of stem cell donations to America while taking only two

from America. In other words, we still owe you 31 cases!

### **Cord Blood Provides Transplant Opportunities for Minorities**

I would like to emphasize the cooperation in cord blood transplantations because it is an area of future growth. 255 cord blood transplants were performed in America in 2005, doubling previous year. NMDP started the cord blood matching program in 2000. The program is currently stable, and its growth is expected to accelerate in the future. In general, cord blood provides more transplant opportunities for minorities than the Caucasian majority. The minorities I am referring to here are African Americans, Asian Americans, American Indians, Native Alaskans, and Hispanics.

NMDP is on the patients' side in facing obstacles. We strive to minimize effects of differences of Asian Americans in culture, language, educational background, geographic locations and economic status. Only through such efforts could we help minorities achieve better treatment results.

Increases in cord blood transplantations for African Americans and Asian Americans are very pronounced. Take the example of African Americans, due to a lack of data banks, there are less success in bone marrow matching. However, cord blood has better matching rate because it does not require a perfect match. For example, satisfying 4 out of the 6 HLA leukocyte antigen matching



Every tube represents a hope of life for a leukemia patient somewhere in the world. Blood tubes collected from donor registry activities.

criteria would be sufficient. Besides, if cord blood stem cell supply is not sufficient in one bag, more bags can be added. This type of multiple-source transplantations has helped save lives of many African Americans.

### **Forward Scout for Donors, and Support for the Recipients and Experts**

Even though we have shared the joy of our patients' new lease on life, more challenges lies ahead. Taiwan and the U.

S. have a good matching system, yet the need continues to increase. Only about 10% eventually had the opportunity for transplantation after a grueling matching process. Although many did find their matching either within or outside the border, due to various reasons, they never reached the final stage of transplantation. I have inquired many doctors about it; the answer was that many patients were too sick by then to have transplants performed. This group of patients consists of 30 to 40 percent of NMDP's applicants.

NMDP serves not only donors, but also the needs of physicians, patients and family members. We wish all who need transplants could get one, and all transplants would be successful. Hence we vow to do our very best.

In addition to increasing sources of stem cells, we also strive to improve in other areas such as providing more information and financial support to patients, and offering advanced courses for physicians. We observed that when financial burdens are lifted, patients are more likely to accept transplantations. Evidently, transplantation per se is not the major obstacle; it's financial burdens and doubts. As soon as these pressures are relieved, patients and their families would have the courage to face transplantation.

### **Expanding the Number of Transplants Will Save Hundreds a Year**

As we know, the survival rate one year after transplantation is less than half. We need to increase this rate. Many patients

become hesitant after learning of this rate. Besides, about 60% do not even have the chance to begin matching before they are too sick to have the transplant performed.

If we can increase the number of patients who get into the matching program from the current 40% to 80%, then America will perform 600 more cases a year. This means 600 more patients will have a chance to live. Because matching can be initiated through many channels: such as requests from family members and from physicians. Any one of these will encourage the patients to receive transplant, and physicians' advice is the key here.

NMDP and Marrow Foundation work together to expand the physician training. We offer physicians per diem and teaching aid allowances so that they could better understand our matching processes, therefore can more effectively work with the NMDP system. Personally, when I first began my residence in hematology and oncology, I cared for several Leukemia patients. At that time, transplantation was still in its infancy. I had to struggle to learn how to make transplant recommendations for my

**This article is based on a speech on November 19, 2005 by Dr. Jeffrey Chell to the Bone Marrow Stem Cell Transplant Symposium. The symposium was hosted by Tzu Chi Stem Cells Center.**

Disclaimer: This article is a translation of a Chinese article based on the original speech, words used are not necessarily the same as those used by Dr. Chell in his original English speech.



**The tank in this photo is for storage of cord blood. Nowadays, the usage of cord blood transplants raises the percentage of transplantation survival rate for certain diseases.**

patients. Coming into the 21 century, with the involvement of various specialties such as oncologist, hematologist, pediatricians, nursing staff, etc., better cares are now possible.

I am very thankful and admire Tzu Chi's achievements in this area. Just as Executive Vice President Ms. Lin Bi Yu has mentioned, Tzu Chi Bone Marrow Data Bank is a multi-function data bank. It has helped many bone marrow transplant patients, accounts for 10% of the world bone marrow types. No other data banks could compare. It is not only a

data bank for the people of Taiwan, but also a bank of new lives for the world at large. Data banks in Norway and Germany pale in comparison. Thank you for soliciting so many bone marrow donors, and help saved the lives of many around the world. I look forward to more active participation of the Tzu Chi Bone Marrow Donor Registry in international cooperation, experience and knowledge sharing. Together, we will work to meet the needs of all patients.