

in collaboration with the



2ND WORKSHOP OF THE WBMT

Salvador - Bahia, Brazil



Establishing / expanding a transplant center

- ✓ What do we need to get started ?
- ✓ Starting HCT programs. A perspective from the front lines:
 - ✓ México
 - ✓ Chile
 - ✓ Brazil



Transplants in Latin America, 1998-2004

	Number	Number of Patients	
	of Teams	Registered	Reported
Argentina	10	517	947
Brazil	11	272	1,432
Mexico	4	136	231
Uruguay	4	—	705
Other*	4	27	141



Centers participating in the CIBMTR 2011



**In México we are
grafting less than
10% of patients who
need a graft**

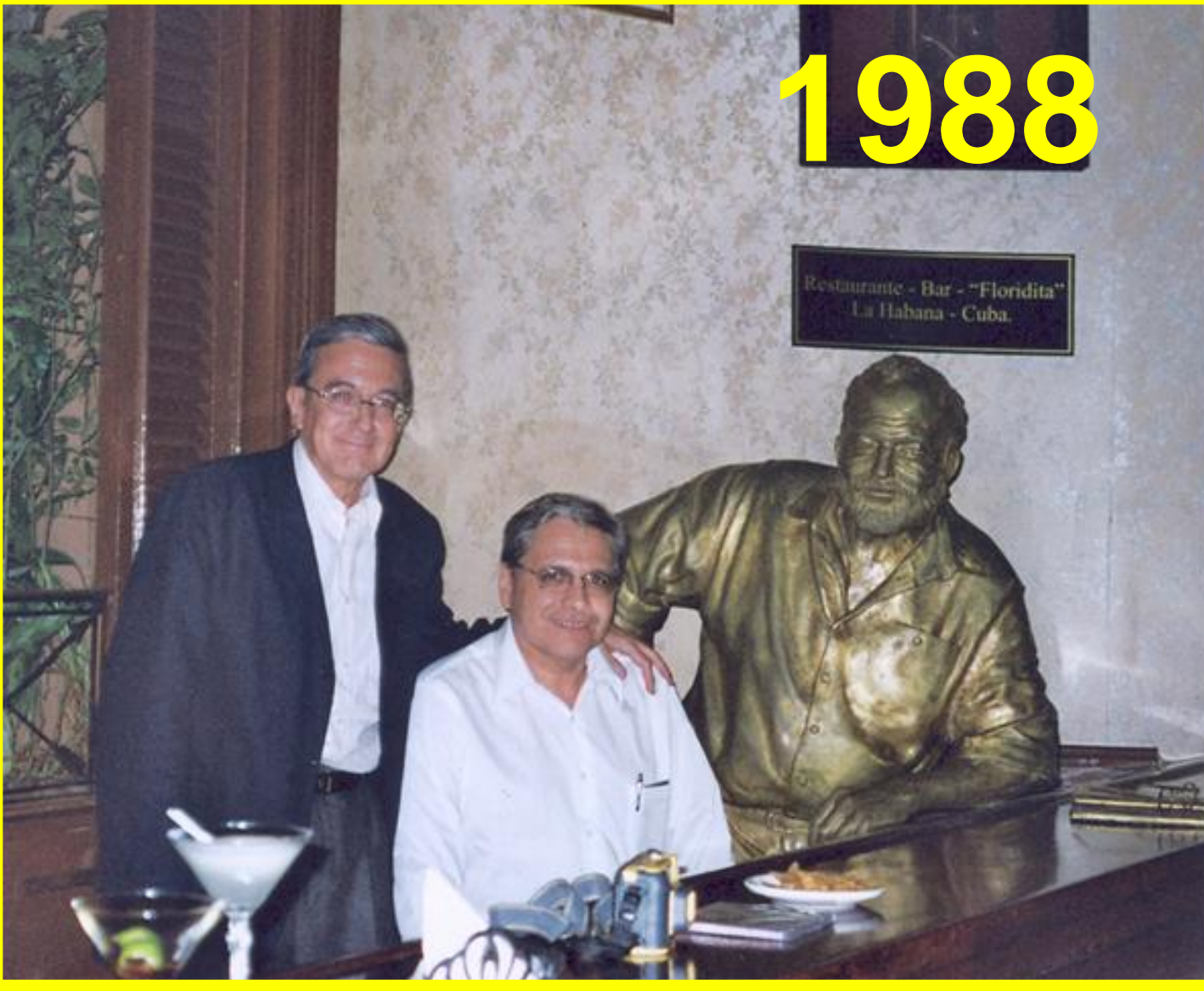
90%



The SCT problem in México:

- ✓ **SCT is an expensive procedure**
- ✓ **SCT needs special units in hospitals**
- ✓ **SCT needs highly trained physicians**

1988



SCT in México



Adapt models from developed countries



Develop own methods



**...as long as we are a reflection of
foreign schools**

**....as long as we only follow,
and not always closely,
the world's scientific movement**

**...as long as our authors are not read
abroad,**

**....this country will not exist
in the world of the learned**

Ignacio Chávez

Mexican physician





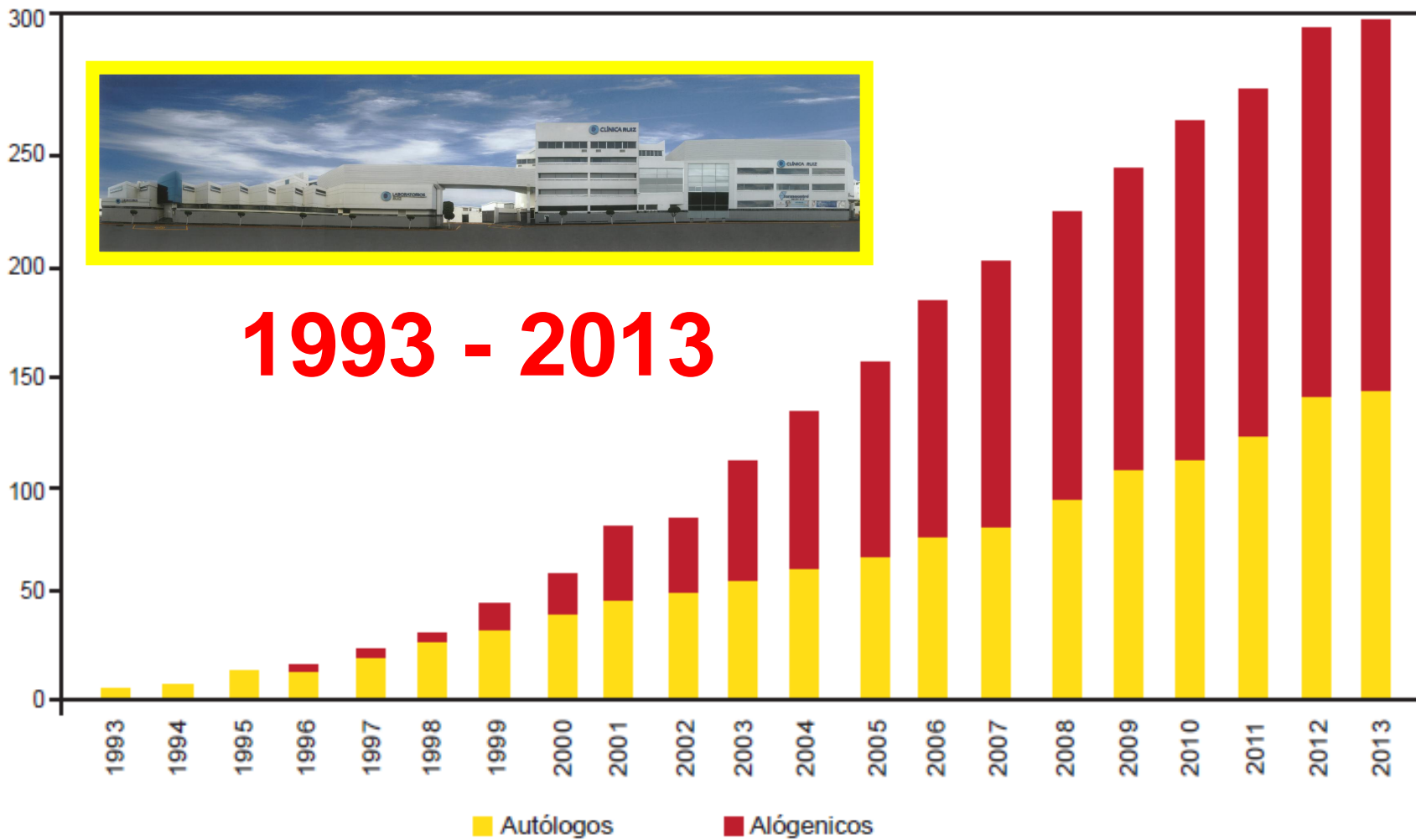
Public

Private





1993 - 2013



Autografts

1993



Simplified autografts

- ✓ Outpatient conduction
- ✓ Non-frozen PBSC
- ✓ Short chemotherapy preparative courses (HD-MFL)
- ✓ Apheresis to obtain $1-6 \times 10^6/\text{Kg}$ CD34 cells
- ✓ Oral antibiotics and antimycotics
- ✓ G-CSF

Results of an Autologous non-cryopreserved, Unmanipulated Peripheral Blood Hematopoietic Stem Cell Transplant Program: A single Institution, 10-year experience.

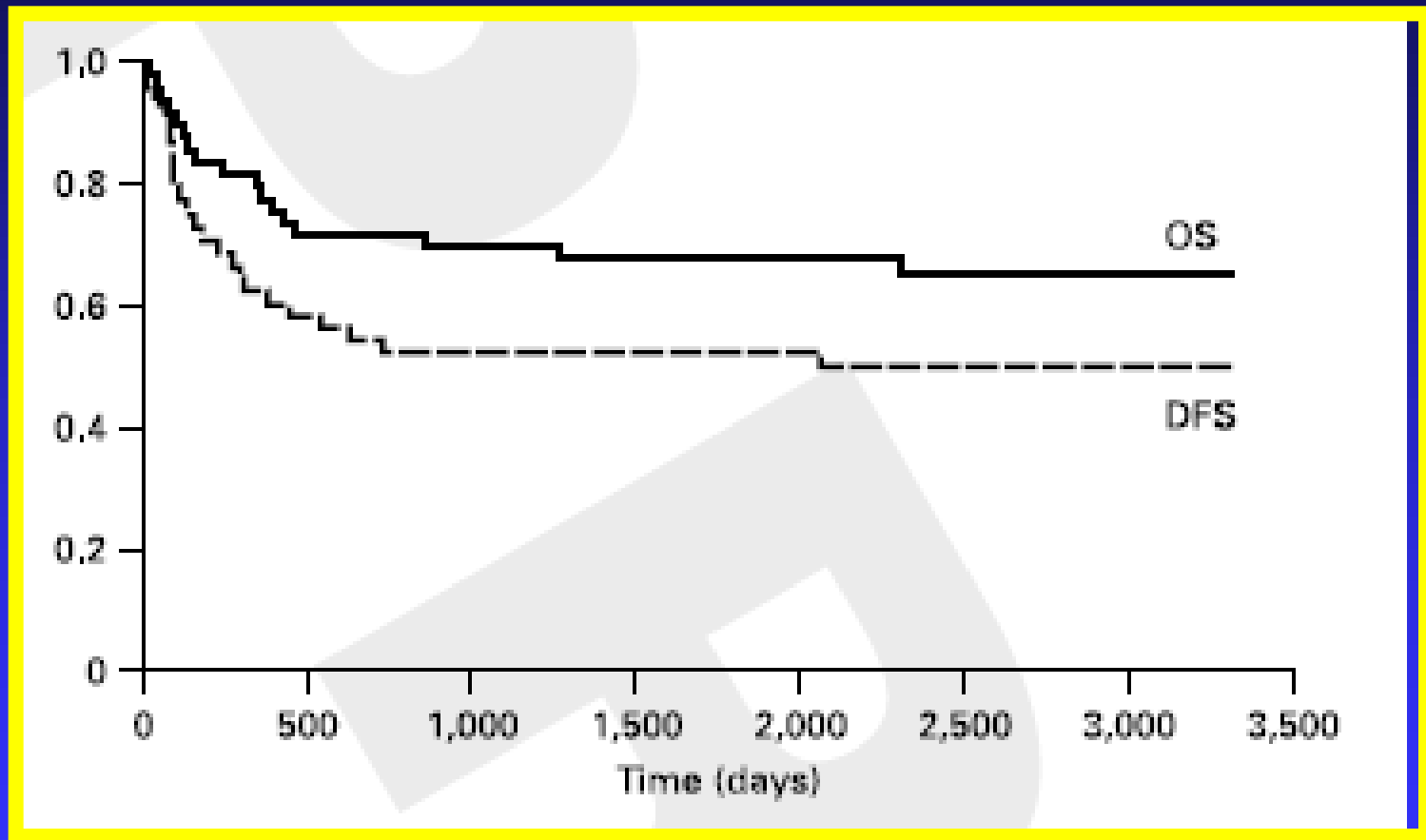
GJ. Ruiz-Argüelles^{a,b} JD. Gómez-Rangel^{a,b} GJ. Ruiz-Delgado^c
A. Ruiz-Argüelles^b B. Pérez-Romano^b L. Rivadeneyra^b

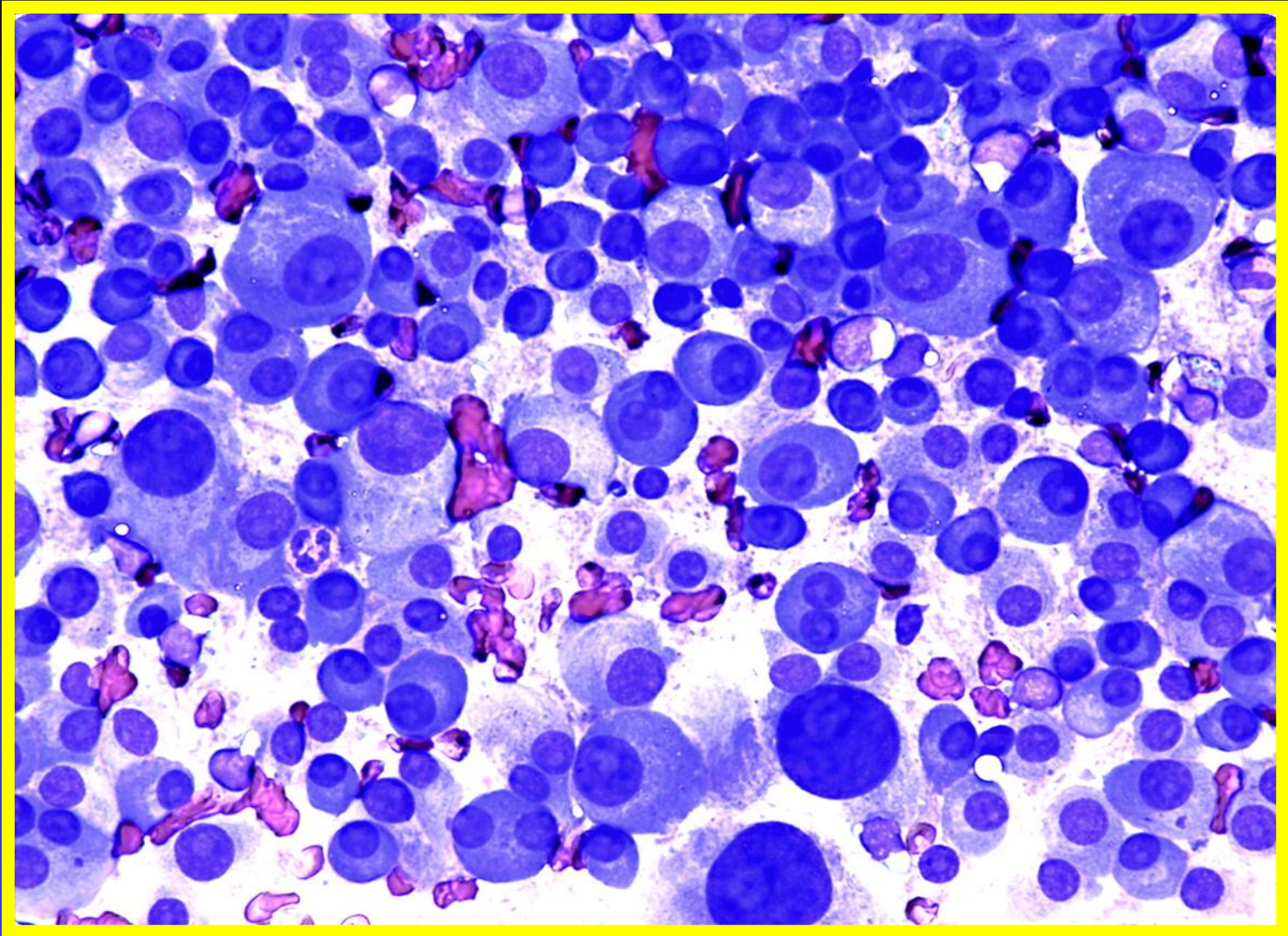
^aCentro de Hematología y Medicina Interna de Puebla, México.

^bLaboratorios Clínicos de Puebla, México.

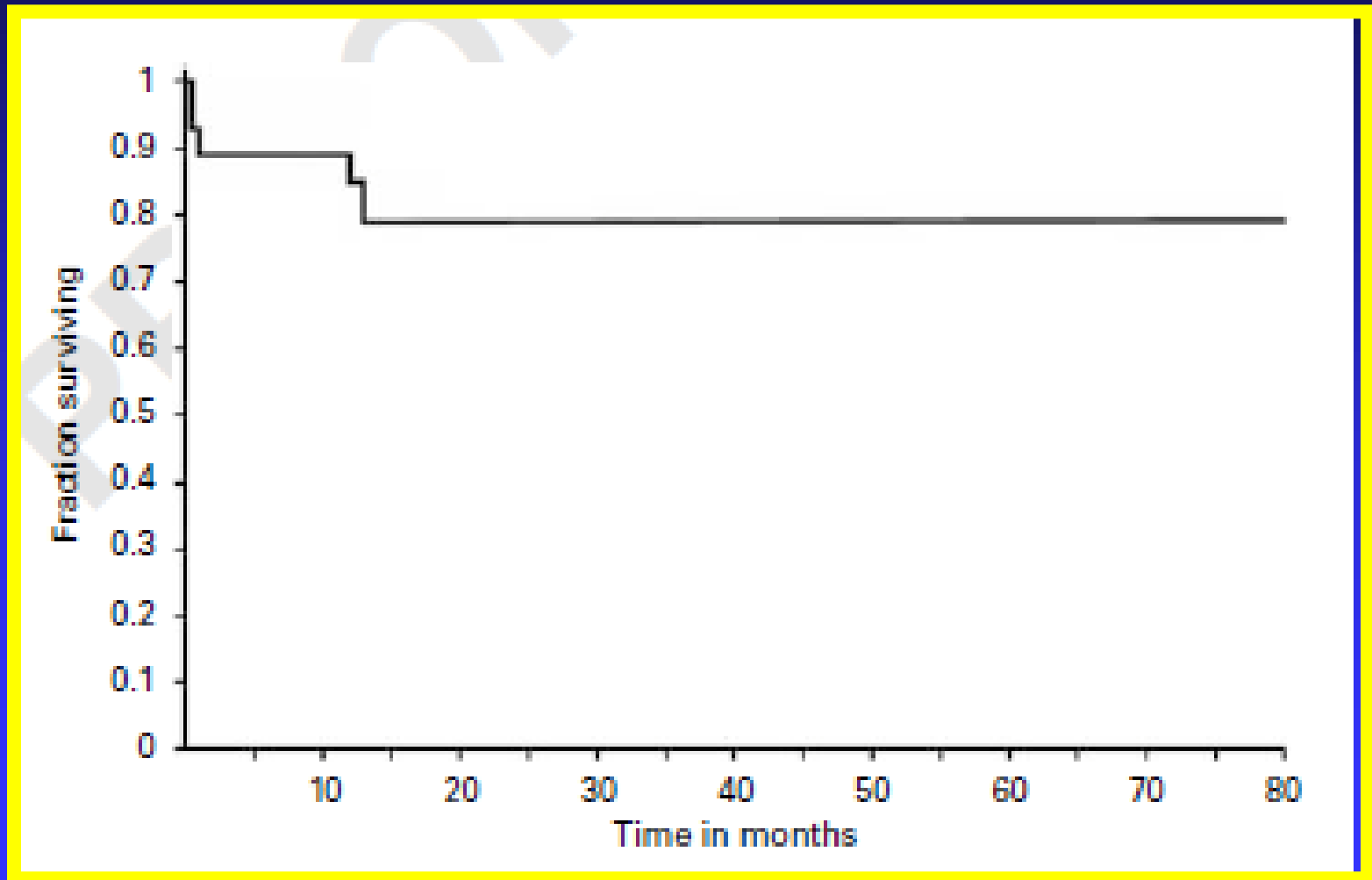
^cInstituto Nacional de Ciencias Médicas y de la Nutrición Salvador Zubirán. México City, México.

Autologous





Autografts in myeloma



2009

Bone Marrow Transplantation (2009) 00, 1–5

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www.nature.com/bmt



ORIGINAL ARTICLE

A simplified method for stem cell autografting in multiple myeloma: a single institution experience

A López-Otero¹, GJ Ruiz-Delgado^{1,2} and GJ Ruiz-Argüelles^{1,2}

¹*Centro de Hematología y Medicina Interna de Puebla, Puebla, Mexico* and ²*Laboratorios Clínicos de Puebla, Puebla, Mexico*

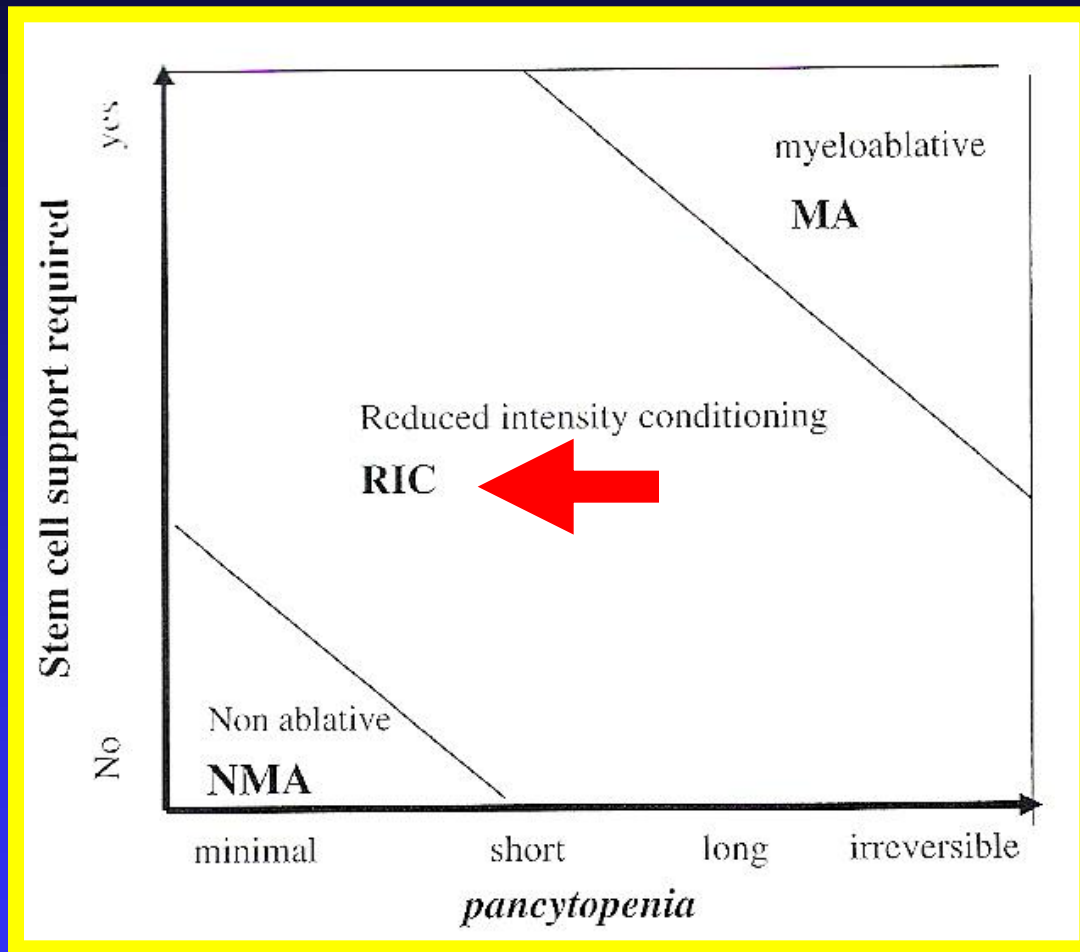
Autografts in México:

10 000 USD

(60 000 USD in USA)

Allografts





BBMT 2009; 15:1628

2000

Bone Marrow Transplantation, (2000) 25, 131-133
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www.nature.com/bmt

Hematopoietic stem cell allografts using a non-myeloablative conditioning regimen can be safely performed on an outpatient basis: report of four cases

D Gómez-Almaguer¹, GJ Ruiz-Argüelles^{2,3}, A Ruiz-Argüelles³, O González-Llano¹, OE Cantú¹ and NE Hernández¹

¹Hospital Universitario de Monterrey; ²Centro de Hematología y Medicina Interna de Puebla; and ³Laboratorios Clínicos de Puebla, Puebla, Mexico

The Mexican method:

- ✓ Affordable drugs (BU, Cy, FLU)
- ✓ Outpatient conduction
- ✓ Limited apheresis (1-6 x 10⁶/Kg CD34 cells)
- ✓ Limited transfusions
- ✓ No ganciclovir
- ✓ No IV Ig
- ✓ No growth factors

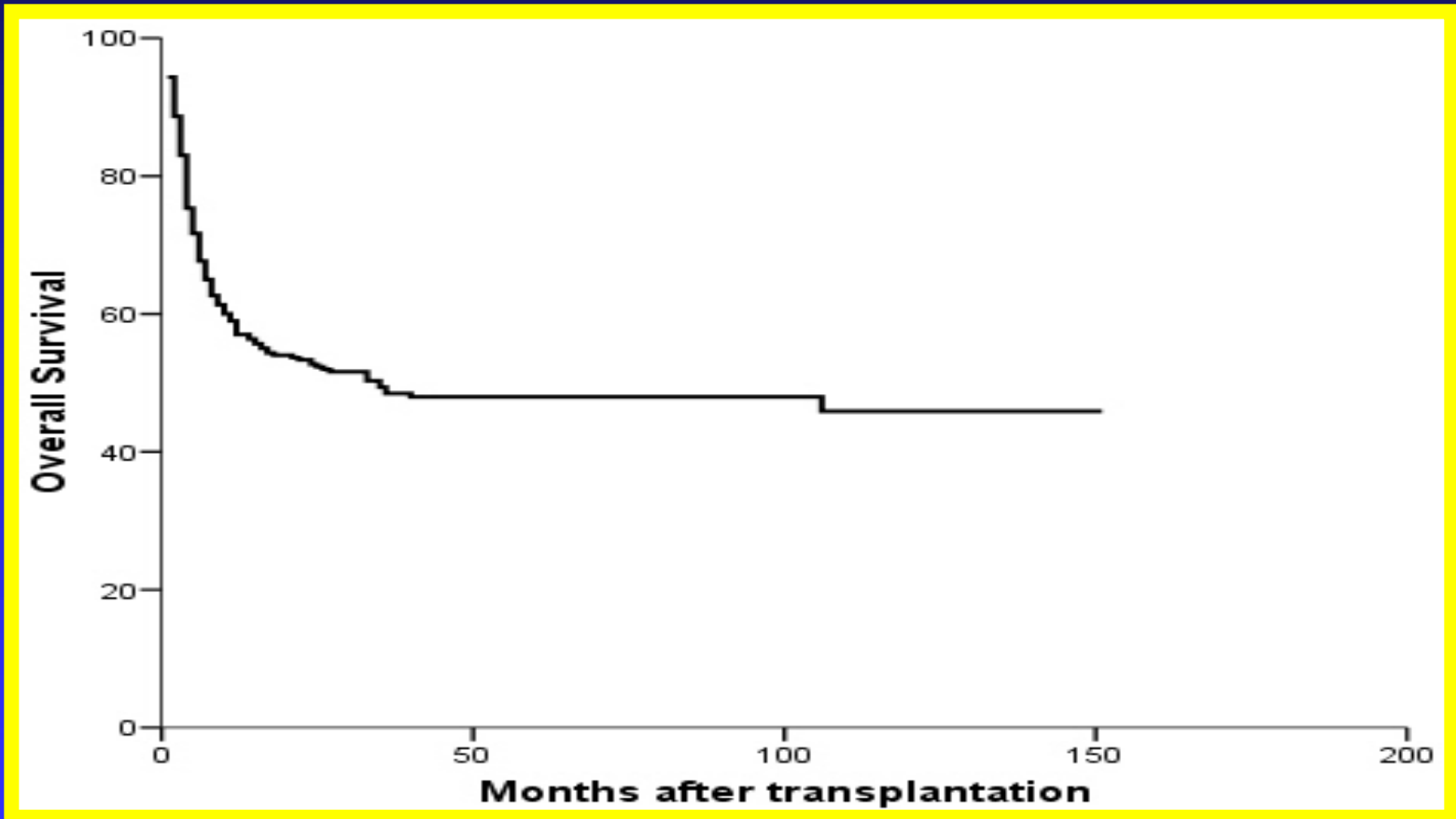
The Mexican method:

- ✓ BSF: 4 mg/Kg, days -6, -5
- ✓ Cy: 350 mg/m², days -4, -3, -2
- ✓ FLU: 30 mg/m², days -4, -3, -2
- ✓ CyA: 5 mg/Kg, days -1 to +180
- ✓ MTX: 5 mg/m² days +1, +3, +5, +11

405 allografts:

- ✓ 13 days to > 500 granulocytes
- ✓ 12 days to $> 20\ 000$ platelets
- ✓ Acute GVHD: 21%
- ✓ Chronic GVHD: 17%
- ✓ 100-day mortality: 17%
- ✓ 150 months OS: 48%
- ✓ Median OS: 1350 days

405 allografts



RIC allografting using the Mexican method:

20 000 USD

(300 000 USD in FHCC)

(500 000 USD in MDACC)

Allografting

The early referral for reduced-intensity stem cell transplantation in patients with Ph1 (+) chronic myelogenous leukemia in chronic phase in the imatinib era: results of the Latin American Cooperative Oncohematology Group (LACOHG) prospective, multicenter study

GJ Ruiz-Argüelles^{1,2}, D Gómez-Almaguer³, A Morales-Toquero¹, CH Gutiérrez-Aguirre³, J Vela-Ojeda⁴, MA García-Ruiz-Esparza⁴, C Manzano¹, A Karduss⁵, A Sumoza⁶, C de-Souza⁷, E Miranda⁷ and S Giralt⁸

¹Centro de Hematología y Medicina Interna de Puebla, Puebla, México; ²Laboratorios Clínicos de Puebla, Puebla, México; ³Hospital Universitario de Monterrey, Monterrey, México; ⁴Centro Médico La Raza, Instituto Mexicano del Seguro Social, México City, México; ⁵Instituto de Cancerología, Clínica Las Américas, Medellín, Colombia; ⁶Universidad de Carabobo, Valencia, Venezuela; ⁷Universidad de Campinas, Sao Paulo, Brazil; and ⁸MD Anderson Cancer Center, Houston, TX, USA

2008

Bone Marrow Transplantation (2008) 00, 1–6
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www.nature.com/brmt

ORIGINAL ARTICLE

Therapeutic choices in patients with Ph-positive CML living in México in the tyrosine kinase inhibitor era: SCT or TKIs?

GJ Ruiz-Argüelles^{1,2}, LC Tarin-Arzaga³, ML Gonzalez-Carrillo², KI Gutierrez-Riveroll¹,
R Rangel-Malo^{1,2}, CH Gutiérrez-Aguirre³, OG Cantú-Rodríguez³, D Gómez-Almaguer³ and S Giralt⁴

¹*Centro de Hematología y Medicina Interna de Puebla, Puebla, México;* ²*Laboratorios Clínicos de Puebla, Puebla, México;* ³*Hospital Universitario de Monterrey, Monterrey, México and* ⁴*MD Anderson Cancer Center, Houston, TX, USA*

2004

Leukemia & Lymphoma, 2004; 45:1191

 Taylor & Francis
healthsciences

Allogeneic Hematopoietic Stem Cell Transplantation with Non-Myeloablative Conditioning in Patients with Acute Myelogenous Leukemia Eligible for Conventional Allografting: A Prospective Study

GUILLERMO J. RUIZ-ARGÜELLES^{a,b,*}, DAVID GÓMEZ-ALMAGUER^c, JOSE DAVID-GOMEZ-RANGEL^a, JORGE VELA-OJEDA^d, OLGA G. CANTÚ-RODRÍGUEZ^c, JOSÉ C. JAIME-PÉREZ^c, OSCAR GONZÁLEZ-LLANO^c, and JOSÉ L. HERRERA-GARZA^c

^a*Centro de Hematología y Medicina Interna de Puebla;* ^b*Laboratorios Clínicos de Puebla;* ^c*Hospital Universitario de Monterrey, Universidad Autónoma de Nuevo León;* ^d*Centro Médico la Raza. Instituto Mexicano del Seguro Social, México City*

2007

Hematology, 2007; 12:193

informa
healthcare

**Non-myeloablative hematopoietic stem cell transplantation is of limited value in advanced or refractory acute myeloblastic leukemia.
The Mexican experience***

C. H. GUTIERREZ-AGUIRRE¹, O. G. CANTÚ-RODRÍGUEZ¹, O. GONZALEZ-LLANO¹,
R. SALAZAR-RIOJAS¹, O. MARTINEZ-GONZÁLEZ¹, J. C. JAIME-PÉREZ¹,
A. MORALES-TOQUERO², L. C. TARÍN-ARZAGA¹, G. J. RUIZ-ARGÜELLES², &
D. GÓMEZ-ALMAGUER¹

¹*Servicio de Hematología del Hospital Universitario "Dr. José E. González". Universidad Autónoma de Nuevo León, Monterrey, NL, México, and* ²*Centro de Hematología y Medicina Interna de Puebla, Puebla, México*

2007

Bone Marrow Transplantation (2007) 00, 1–5
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www.nature.com/bmt

ORIGINAL ARTICLE

Non-myeloablative stem cell transplantation in patients with relapsed acute lymphoblastic leukemia: results of a multicenter study

CH Gutierrez-Aguirre¹, D Gomez-Almaguer¹, OG Cantu-Rodríguez¹, O Gonzalez-Llano¹, JC Jaime-Perez¹, S Herena-Perez², CA Manzano², R Estrada-Gomez³, ML Gonzalez-Carrillo³ and GJ Ruiz-Argüelles^{2,3}

¹*Servicio de Hematología del Hospital Universitario de Monterrey, Monterrey, México;* ²*Centro de Hematología y Medicina Interna de Puebla, Puebla, México* and ³*Laboratorios Clínicos de Puebla, Puebla, México*

2003

Biol Blood Marrow Transplant 2003;9:157-61

ASBMT
American Society for Blood
And Marrow Transplantation

Reduced-Intensity Stem Cell Transplantation in Children and Adolescents: The Mexican Experience

David Gómez Almaguer¹, Guillermo J. Ruiz-Argüelles^{2,3}, Luz del Carmen Tarín-Arzaga¹, Oscar González-Llano¹, José Carlos Jaime-Pérez¹, Briceida López-Martínez^{2,3}, Olga G. Cantú-Rodríguez¹, José Luis Herrera-Garza MD¹

¹Hospital Universitario, Universidad Autónoma de Nuevo León, Monterrey, Nuevo León, México; ²Centro de Hematología y Medicina Interna de Puebla, Puebla, Puebla, México; ³Laboratorios Clínicos de Puebla, Puebla, Puebla, México

2006

American Journal of Hematology 81:157–161 (2006)

Allografting in Patients With Severe, Refractory Aplastic Anemia Using Peripheral Blood Stem Cells and a Fludarabine-Based Conditioning Regimen: The Mexican Experience

**David Gómez-Almaguer,¹ Jorge Vela-Ojeda,² José C. Jaime-Pérez,¹
César H. Gutiérrez-Aguirre,¹ Olga G. Cantú-Rodríguez,¹ Pedro Sobrevilla-Calvo,³
Silvia Rivas-Vera,³ J. David Gómez-Rangel,⁴ and Guillermo J. Ruiz-Argüelles^{4*}**

¹ Servicio de Hematología, Hospital Universitario Dr. José Eleuterio González, UANL, Monterrey, Nuevo León, NL, Mexico

² Centro Médico La Raza, Instituto Mexicano del Seguro Social, México City, Mexico

³ Instituto Nacional de Cancerología, México City, Mexico

⁴ Centro de Hematología y Medicina Interna de Puebla, Puebla, Mexico



2003

Archives of Medical Research (2003) 34: 242-245

ORIGINAL ARTICLE

**Successful Allogeneic Stem Cell Transplantation With
Nonmyeloablative Conditioning in Patients With Relapsed Hodgkin's
Disease Following Autologous Stem Cell Transplantation**

Guillermo J. Ruiz-Argüelles^{a,b}, Briceida López-Martínez^b and Benjamín López-Ariza^a

^aCentro de Hematología y Medicina Interna de Puebla, ^bLaboratorios Clínicos de Puebla.

2010

Ann Hematol 2010; May 21

ORIGINAL ARTICLE

Outpatient reduced-intensity allogeneic stem cell transplantation for patients with refractory or relapsed lymphomas compared with autologous stem cell transplantation using a simplified method

Cesar Homero Gutiérrez-Aguirre • Guillermo Ruiz-Argüelles •
Olga Graciela Cantú-Rodríguez • Oscar González-Llano • José Carlos Jaime-Pérez •
Fernando García-Rodríguez • Avril López-Otero • José Luis Herrera-Garza •
David Gómez-Almaguer

In pursuit of the graft-versus-myeloma effect: A single institution experience

**Evelyn Gisella Galo-Hooker¹, Guillermo José Ruiz-Delgado^{1,2,3},
Gabriela Zamora-Ortiz^{1,4}, Sara Velazquez-Sanchez-de-Cima^{1,3},
Guillermo José Ruiz-Arguelles^{1,2,3,4}**

¹Centro de Hematología y Medicina Interna, Clinica Ruiz, Puebla, Mexico, ²Laboratorios Clínicos de Puebla, Clinica Ruiz, Puebla, Mexico, ³Universidad Popular Autónoma del Estado de Puebla, Mexico, ⁴Universidad de las Américas Puebla, Mexico

2005

Bone Marrow Transplantation (2005) 00, 1–6
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www.nature.com/bmt



Bloodless (transfusion-free) hematopoietic stem cell transplants: the Mexican experience

GJ Ruiz-Argüelles^{1,2}, A Morales-Toquero¹, B Lopez-Martinez^{1,2}, L-del-C Tarin-Arzaga³ and C Manzano⁴

¹*Centro de Hematología y Medicina Interna de Puebla, Puebla, PUE, Mexico;* ²*Laboratorios Clínicos de Puebla, Puebla, PUE, Mexico;* ³*Hospital Universitario de Monterrey, Monterrey, Mexico;* ⁴*Benemérita Universidad Autónoma de Puebla, Puebla, PUE, Mexico*

ORIGINAL ARTICLE

A single apheresis procedure in the donor may be enough to complete an allograft using the "Mexican Method" of non-ablative allografting

Guillermo J. Ruiz-Delgado^{1,2}, Karla I. Gutiérrez-Riveroll¹, César H. Gutiérrez-Aguirre³, David Gómez-Almaguer³, Renee Eyzaguirre-Zapata¹, Manuel Priesca-Marin⁴, Martha L. González-Carrillo², Guillermo J. Ruiz-Argüelles^{1,2}

¹Centro de Hematología y Medicina Interna de Puebla; ²Laboratorios Clínicos de Puebla; ³Hospital Universitario de Nuevo León; ⁴Servicios Integrales de Medicina Transfusional y Hemaféresis de Puebla, Mexico.

Outpatient allografting:

2000

Bone Marrow Transplantation, (2000) 25, 131-133
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www.nature.com/bmt

Hematopoietic stem cell allografts using a non-myeloablative conditioning regimen can be safely performed on an outpatient basis: report of four cases 4 cases

D Gómez-Almaguer¹, GJ Ruiz-Argüelles^{2,3}, A Ruiz-Argüelles³, O González-Llano¹, OE Cantú¹ and NE Hernández¹

¹Hospital Universitario de Monterrey; ²Centro de Hematología y Medicina Interna de Puebla; and ³Laboratorios Clínicos de Puebla, Puebla, Mexico

Outpatient allografting:

2007

Bone Marrow Transplantation (2007) 40, 119–123
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www.nature.com/bmt



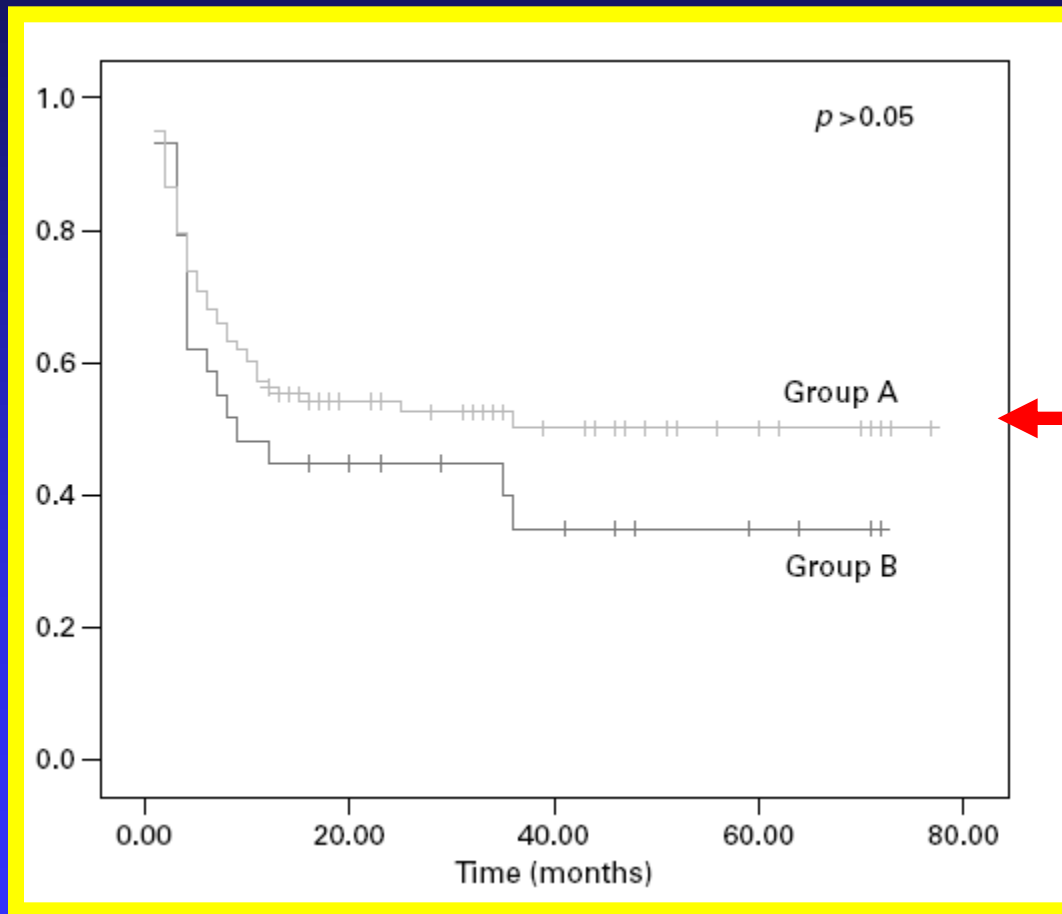
ORIGINAL ARTICLE

Outpatient allografting using non-myeloablative conditioning: the Mexican experience **132 cases**

OG Cantú-Rodríguez¹, JC Jaime-Pérez¹, CH Gutiérrez-Aguirre¹, O González-Llano¹,
C Mancías-Guerra¹, LC Tarín-Arzaga¹, GJ Ruiz-Delgado¹, CC Sandoval-Villa¹, J Marfil-Rivera¹,
A Morales-Toquero², GJ Ruiz-Argüelles² and D Gómez-Almaguer¹

¹*Servicio de Hematología, Hospital Universitario 'Dr José Eleuterio González', Universidad Autónoma de Nuevo León, Nuevo León, México and* ²*Centro de Hematología y Medicina Interna de Puebla, Puebla, México*

Outpatient allografting:



GVHD



- ✓ 301 allografts, PBSC, RIC, outpatient conduction
- ✓ Acute GVHD: 21%
- ✓ Chronic GVHD: 17%
- ✓ GVHD mortality: 11%

2011

European Journal of Haematology

ORIGINAL ARTICLE

Low incidence and severity of graft-*versus*-host disease after outpatient allogeneic peripheral blood stem cell transplantation employing a reduced-intensity conditioning

Olga G. Cantú-Rodríguez¹, César H. Gutiérrez-Aguirre¹, José C. Jaime-Pérez¹, Oscar R. Treviño-Montemayor¹, Sylvia A. Martínez-Cabriales¹, Alvaro Gómez-Peña¹, Avril López-Otero², Guillermo J. Ruiz-Delgado^{2,3}, Oscar González-Llano¹, María C. Mancías-Guerra¹, Luz D.C. Tarín-Arzaga¹, Laura N. Rodríguez-Romo¹, Guillermo J. Ruiz-Argüelles^{2,3}, David Gómez-Almaguer¹

GVHD in the Mexican method

RIC

Outpatient

PBSC



GVHD

HemOnc Today 2012, Aug 25

Editorial

Allografting on outpatient basis can decrease GVHD prevalence, severity

by **Guillermo J. Ruiz-Argüelles, MD, FACP, FCRP (Glasg)**; and **David Gómez-Almaguer, MD**

Allogeneic hematopoietic stem cell transplantation is an effective and potentially curative treatment for a variety of hematological diseases.

Reduced-intensity conditioning (RIC) has been developed to decrease regimen-related toxicity of allogeneic hematopoietic stem cell transplantation (allo-SCT) and to induce host-versus-graft transplantation tolerance with rapid engraftment of donor stem cells, subsequently diminishing graft-versus-host disease (GVHD).

RIC is appropriate for the elderly and other high-risk patients who are otherwise ineligible to receive conventional allografts.

GVHD is still a major cause of morbidity and mortality after allo-SCT. The disease is a complication that may considerably limit the benefit of transplan-



Guillermo J.
Ruiz-Argüelles



David
Gómez-Almaguer

have resulted in the simplification of performing allografts.

The use of RIC regimens for allografting by our group and others has resulted in a substantial reduction in cost, and because the cost of grafting peripheral blood stem cells is lower than the cost of allografting using bone marrow-derived stem cells, we elected to use peripheral blood stem cells and implement it as an outpatient procedure.

A number of studies — both randomized and nonrandomized — have

incidence of acute GVHD. In Sweden, Svahn and colleagues studied the long-term follow-up of patients treated at home during the pancytopenic phase after myeloablative allogeneic stem cell transplantation and pointed out several advantages, including a reduced risk for acute GVHD. Seventeen percent of patients in the outpatient transplant group developed grade-2 to grade-4 acute GVD vs. 44% in the inpatient transplant group, and 52% of patients in the outpatient transplant group developed chronic GVHD vs. 57% in the inpatient transplant group.

Environmental factors seem to be critical in the development of GVHD and probably should receive more attention.

HemOnc Today 2012, Sept 10

PERSPECTIVE



Harry S. Jacob

An editorial by Guillermo J. Ruiz-Arguelles, MD, FACP, FRCP(Glasg), in the Aug. 25 issue of HEMONC TODAY notes an astonishing reduction of graft-versus-host disease in Mexican bone marrow transplant patients who are not hospitalized but immediately sent home after their outpatient procedure! Re-entry into their familiar microbial environment, with reconstitution of colonic flora, may inhibit *C. difficile* overgrowth and its likely amplification of GVHD — a markedly different scenario than that experienced by transplant patients in microbe-deficient hospital rooms in “developed countries.”

— Harry S. Jacob, MD, FRCPath(Hon)

HEMONC TODAY Chief Medical Editor

Disclosure: Dr. Jacob reports no relevant financial disclosures.

RIC using the “Mexican method”

- ✓ RIC “cures” about the same proportion of patients
- ✓ RIC is not a simple way to allograft
- ✓ RIC needs strong laboratory support
- ✓ RIC does not require special units
- ✓ RIC can be conducted on an outpatient basis
- ✓ RIC is cheaper



2000

Hematopoietic stem cell allografts using a non-myeloablative conditioning regimen can be safely performed on an outpatient basis: report of four cases

D Gómez-Almagro¹, Ruiz-Argüelles¹, O González-Llana³, Cantú¹
and NE Hernández¹

¹Hospital Universitario, ²Centro de Hematología y Medicina Interna de Puebla; and ³Laboratorios Clínicos de Puebla, Puebla, Mexico

104

In pursuit of the graft-versus-leukemia effect: A single institution experience

Evelyn Gisel Lo-Hooker¹, José Ruiz-Delgado¹,
Gabriela Zamora-Ortiz^{1,4}, Sara Velazquez-Sanchez-de-Cima^{1,3},
Guillermo José Ruiz-Argüelles^{1,2,3,4}

2013

¹Centro de Hematología y Medicina Interna, Clínica Ruiz, Puebla, Mexico, ²Laboratorios Clínicos de Puebla, Clínica Ruiz, Puebla, Mexico, ³Universidad Popular Autónoma del Estado de Puebla, Mexico, ⁴Universidad de las Américas Puebla, Mexico

NST in México:

- ✓ **More patients allografted**
- ✓ **More patients cured**
- ✓ **More papers published**
- ✓ **Better physician education**
- ✓ **Better healthcare**



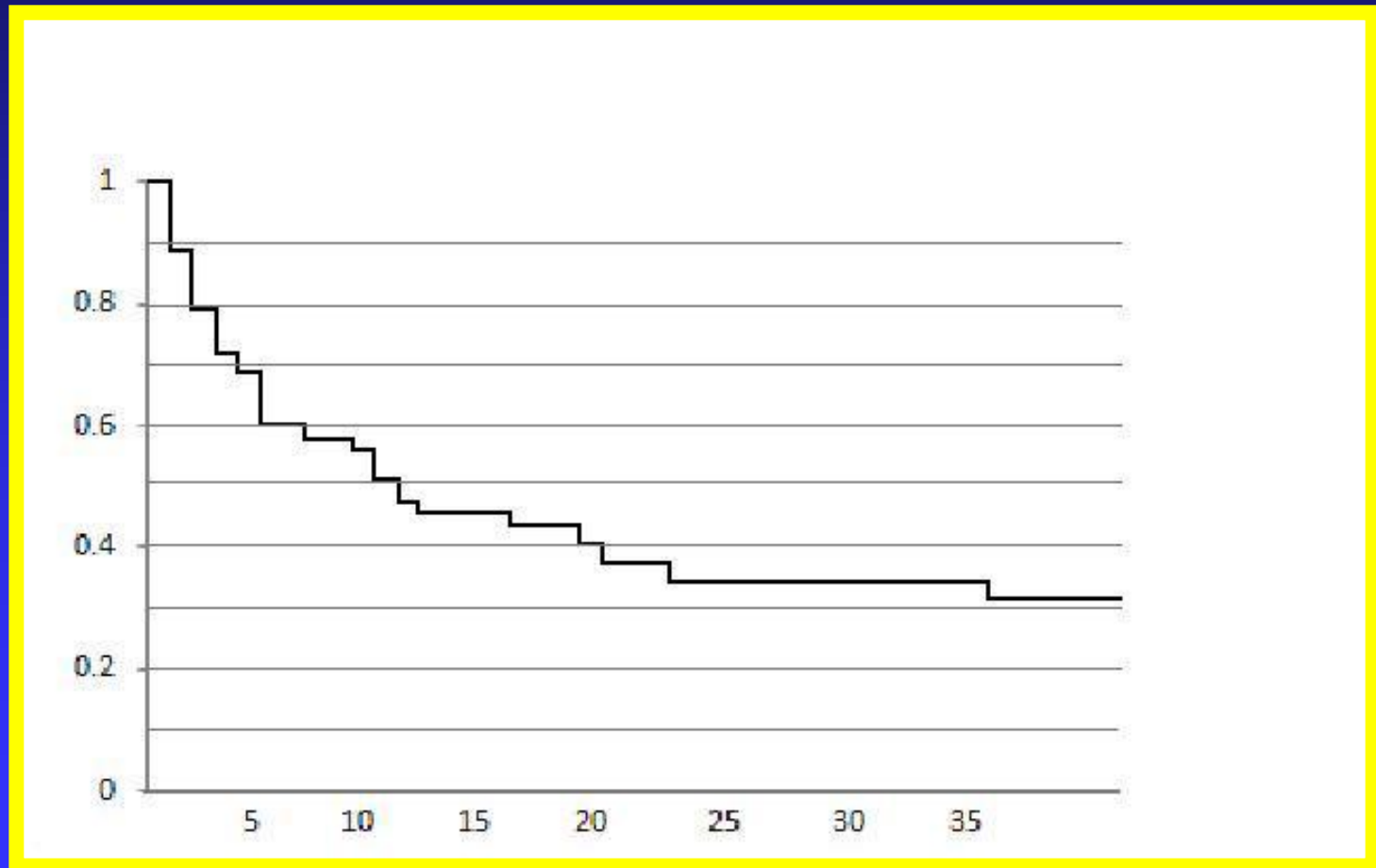


Long-term results of placental blood allografting using reduced-intensity conditioning: multicenter experience in a developing country

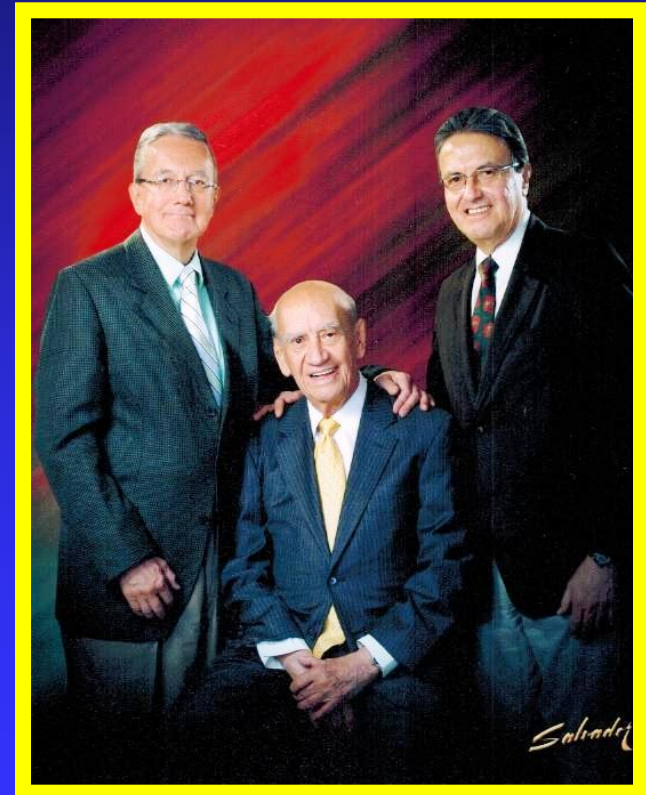
Guillermo J. Ruiz-Delgado^{1,2}, Consuelo Mancias-Guerra³, Julio Macias-Gallardo¹, Oscar Gonzalez-Llano³, Ana Hernandez-Arizpe¹, Laura Nelly Rodriguez-Romo³, Sylvia Aide Martinez-Cabriales³, David Gómez-Almaguer³, Guillermo J. Ruiz-Argüelles^{1,2}

¹Centro de Hematología y Medicina Interna de Puebla, ²Laboratorios Clínicos de Puebla, Clínica Ruiz, Puebla, Mexico, ³Hospital Universitario, Universidad Autónoma de Nuevo León, Monterrey, Mexico

68 placental blood allografts



Haploidentical allografts





VS



Hematology 2013, *in the press*

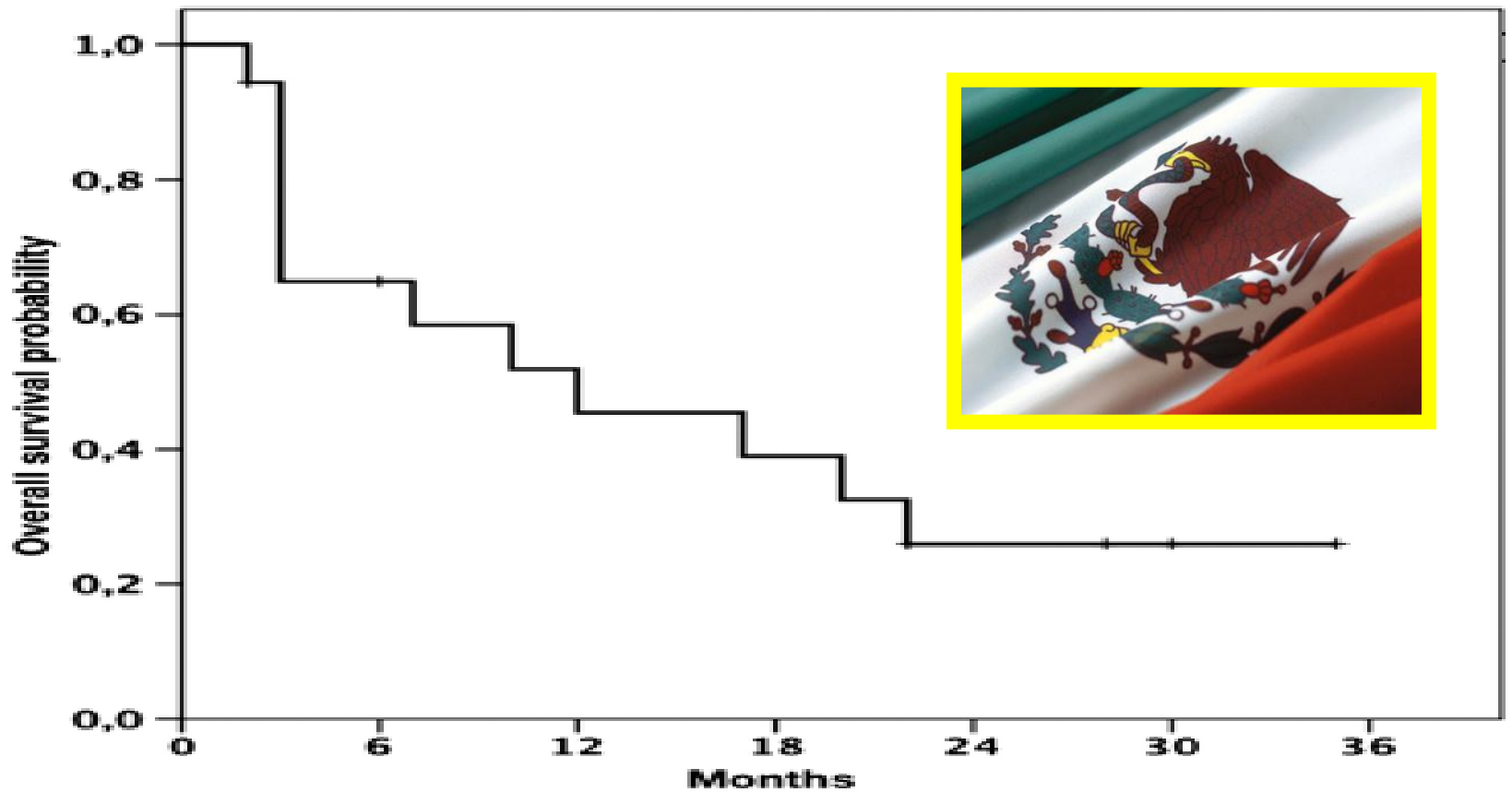


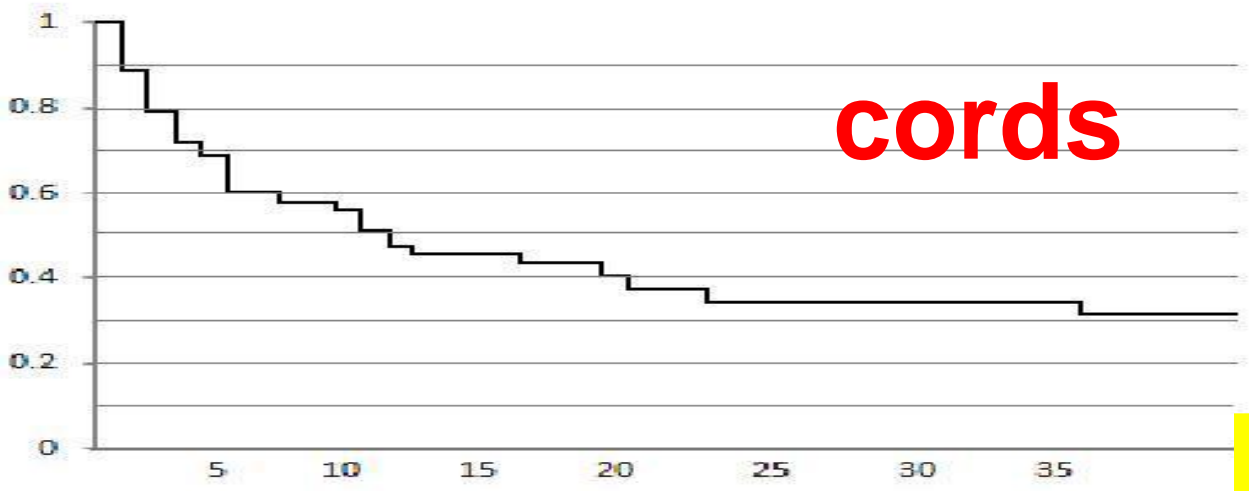
Original research paper

Feasibility of an outpatient HLA haploidentical stem cell transplantation program in children using a reduced-intensity conditioning regimen and CD3–CD19 depletion

Oscar González-Llano, Laura Nelly Rodríguez-Romo, María del Consuelo Mancías-Guerra, Luz Tarín-Arzaga, José Carlos Jaime-Pérez, José Luis Herrera-Garza, Olga Graciela Cantú-Rodríguez, César Homero Gutiérrez-Aguirre, Ricardo Daniel García-Sepúlveda, Ana Yuritzen García-Marín, Laura Villarreal-Martínez, María del Rosario Salazar-Riojas, David Gómez-Almaguer

18 haploidentical allografts





cords



haplos

Haplos *versus* cords

- ✓ Similar long term results
- ✓ Haplos are cheaper (Cy)
- ✓ No cord blood banks
- ✓ More realistic in underprivileged circumstances





Suggestions for SCT:

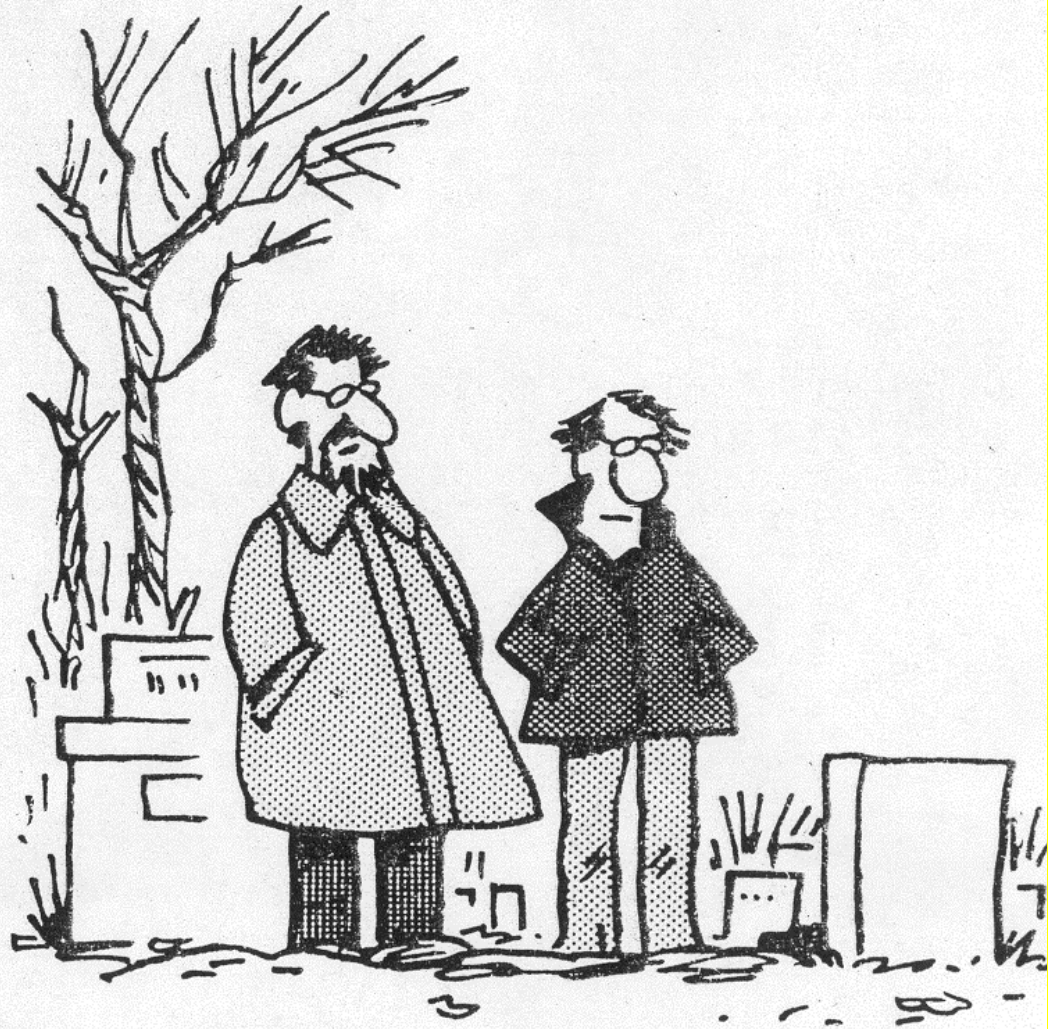
- ✓ Start with autos
- ✓ Graft initially “easy” cases
- ✓ Proceed with allografts
- ✓ Do not be a copycat
- ✓ Proceed with cords
- ✓ Proceed with haplos (CFM ?)
- ✓ Send data to registries



Suggestions for SCT:

- ✓ **Public and private**
- ✓ **Children and adults**
- ✓ **Strong laboratory support**
- ✓ **Strong blood bank support**
- ✓ **Outpatient or in-hospital**
- ✓ **Publish or perish**





Jim Berry

© 1992 by NEA, Inc.

"He didn't publish, so he perished."

