



2nd Workshop of the WBMT

Salvador – Bahia, Brazil

Cost of a Program

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Health System in Brazil (SUS)

First Hospitalization:



HSCT unrelated R\$71.602,25 \$33,774

HSCT related: R\$54.939,27 \$25,914

HSCT auto:R\$ 22.968,68 \$10,834

Since 2012 , to “stimulate” the increase of transplants government

60%- Unrelated/4 solid organs =R\$114.563,60 \$54,039

50%- related Allo+2 /3 solid organs R\$87.362,93 \$41,209

40%- related Allo+1/2 solid organs R\$32.156,15 \$ 36,280

After Discharge of HSCT

Hospital Re admission

Value :R\$397,79 (allo), \$237,6 – plus drugs,lab test,blood ...

Value:R\$ 127,60 (auto), \$76,4 – plus drugs, lab test blood....

*USD/BRL (2013) =2,12

PORTARIA No- 845, DE 2 DE MAIO DE 2012



HSC Transplant Centers

35 active public BMTC

912 HSCT in 2013 (jan-jul)

50% São Paulo

Available from: <http://sigtap.datasus.gov.br/tabela-unificada/app/sec/procedimento/publicados/consultar>



There is little information about
HSCT Cost in Brazil

- AMEO 2009 – Cost of HSCT in Brazil
- adult related at Santa Casa de SP
- pediatrics unrelated/related/auto at IOP-GRAACC

Objective:

First-year cost of HSCT of 10 sequential patients
started in 2011

USD/R\$ (2011)1,675

Design and Method:

- Retrospective and descriptive survey of costs through analysis of medical records
- All the data was collected manually by the bone marrow nurses, as we do not have electronic patient files.
- Data was divided in 7 different time periods:
 - 1)pre-transplant evaluation;
 - 2)Conditioning therapy -infusion
 - 3) Infusion SC until first discharge
 - 4)Discharge until D+100
 - 5)D+100 – 6 months
 - 6)6 months – 1 year
 - 7)late (second year)



After the collection of the database specific categories of costs were priced by the financial department:

- Hospitalization Cost (room and board, healthcare prof.)
- Laboratory Tests
- Blood Products
- Medicines
- Radiological Examinations
- Medical Fees
- Materials
- Medical Specialists
- Biopsy
- Infusion Procedures
- Catheter Insertion



Not included:

- Donor search and stem cell collection,
- Nonmedical cost as transportation, food and lodging
- Donations - not included in the cost:

TBI, PCR for virus search, VNTR, PET SCAN, and drugs as Tacrolimus, MMF, everolimus, cidofovir , foscarnet...

Usually are not available in the public Hospital for HSCT.

- Oral medication for the out patient



General Hospital -700 beds
Foundation -Public Health System



HSCT Unit- Santa Casa SP
Coordenation: Dr. José Carlos Barros
20 years - 800 BMT
(70% auto, 30%allo)

70 HSCT /year

Inpatient Unit
4 rooms with 1 – 2 beds (total = 6)

Human Resources

- 7 nurses
- 16 technicians
- 3 medical doctors 6h/d





Patients:

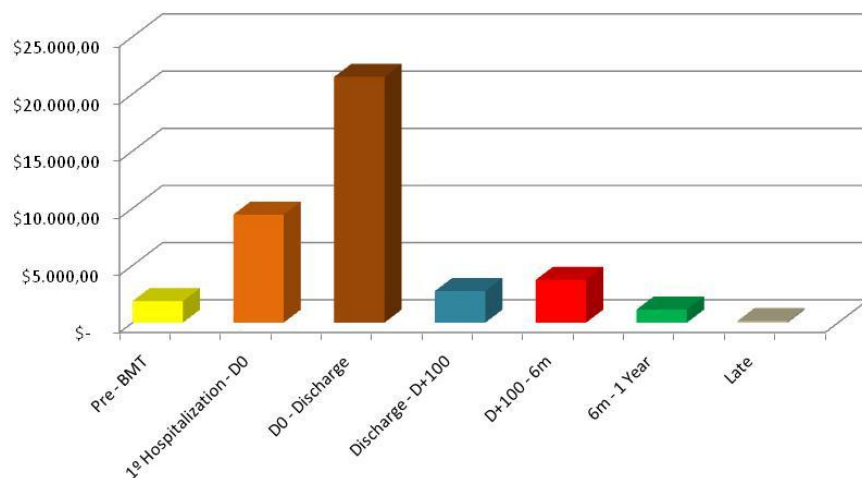
- ✓ N=10 sequential allogeneic HSCT
- ✓ Hematological diseases
- ✓ Mean age:30 (19-49)
- ✓ Graft source:2 BM, 8 PBSC
- ✓ Hospitalization : 25 d (18-53d)
- ✓ Platelet engraftment=11d (8-23d)
- ✓ Neutrophil engraftment=14d (8-25d)
- ✓ Re admission: 4 patients (2-15d)

OS 2 years: 70%

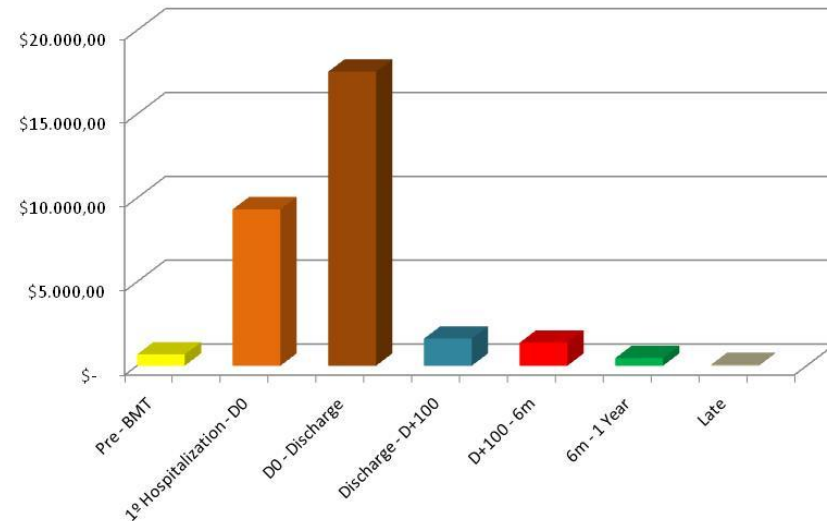
Cause of death: GVHDA (1), relapse (2)

One Year Cost of Allogeneic Hematopoietic Stem Cell Transplantation at Santa Casa SP

Mean Cost / Period



Median Cost/ Period

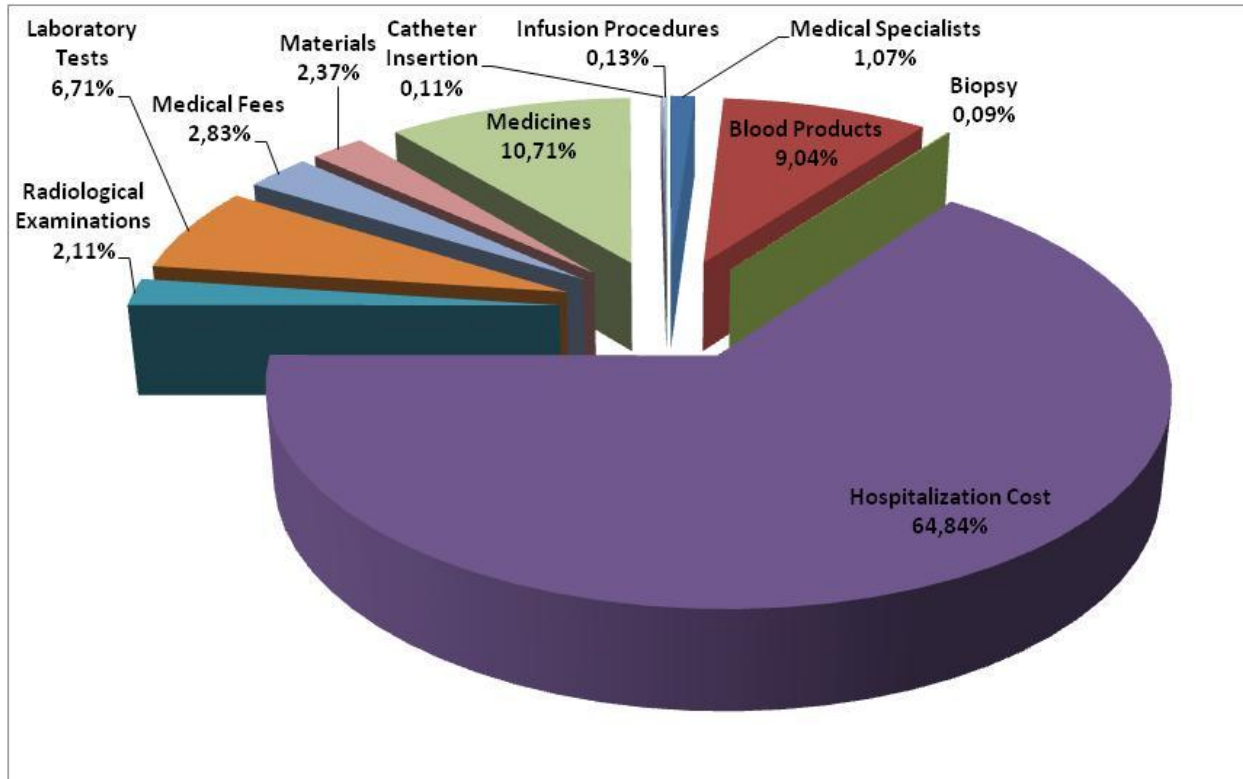


	Pre - BMT	1ª Hospitalization - D0	D0 - Discharge	Discharge - D+100	D+100 - 6m	6m - 1 Year	Late	Total Value
Mean	\$ 1.876,86	\$ 9.448,33	\$ 21.488,61	\$ 2.763,12	\$ 3.740,01	\$ 1.147,66	\$ 132,64	\$ 40.597,23
Median	\$ 671,52	\$ 9.324,19	\$ 17.540,14	\$ 1.613,93	\$ 1.370,25	\$ 451,81	\$ 51,10	\$ 31.022,94
Standard Deviation	\$ 2.057,48	\$ 3.911,99	\$ 10.772,28	\$ 2.580,02	\$ 6.891,09	\$ 2.428,38	\$ 161,46	

currency conversion USD/R\$ (2011)= 1,675



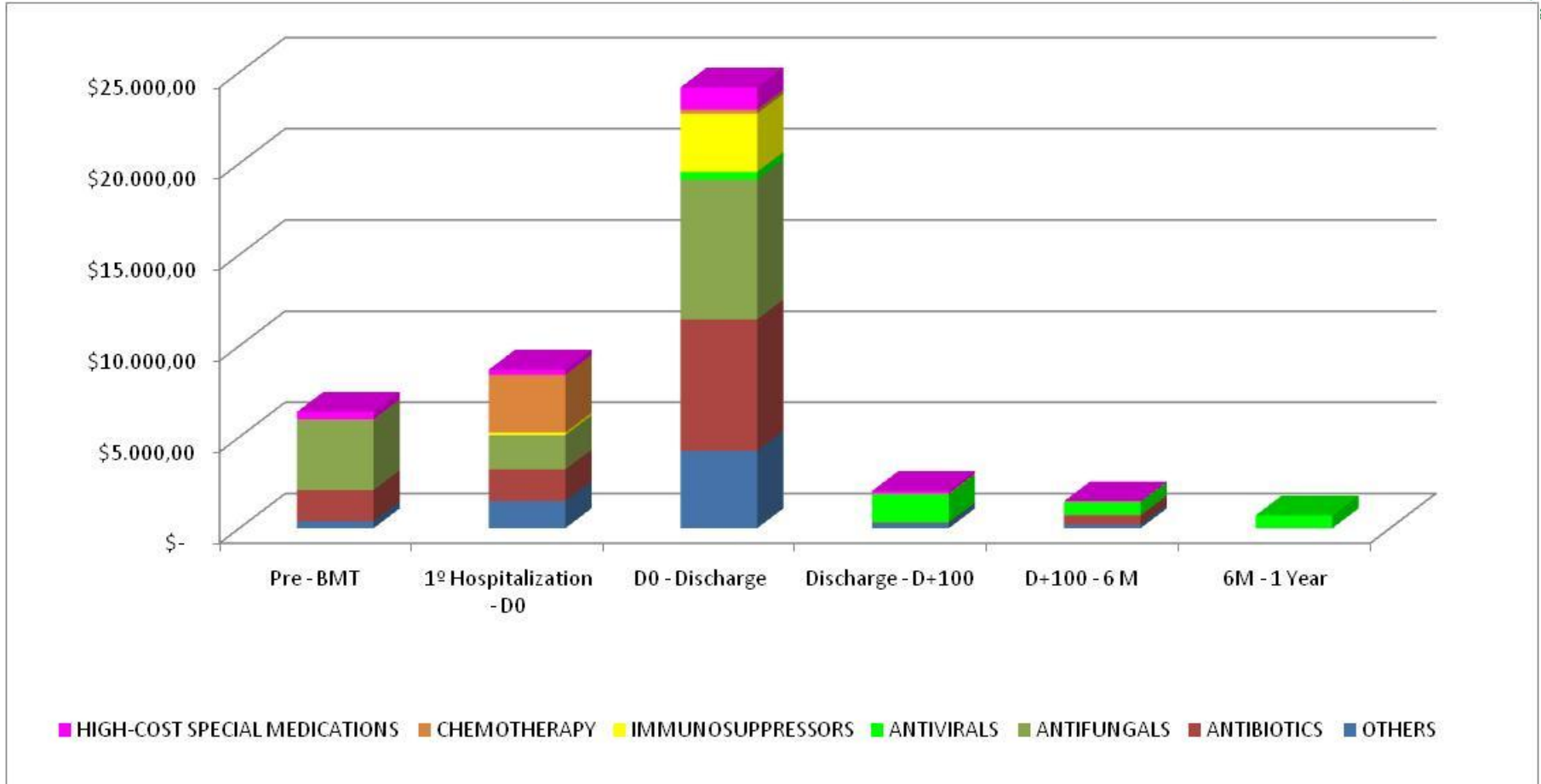
Total Cost of HSCT during the first year - Specific Categories



	Total
Hospitalization Cost	\$ 263.216,64
Medicines	\$ 43.479,59
Blood Products	\$ 36.704,21
Laboratory Tests	\$ 27.238,71
Medical Fees	\$ 11.482,17
Materials	\$ 9.621,27
Radiological Examinations	\$ 8.556,60
Medical Specialists	\$ 4.324,99
Infusion Procedures	\$ 518,47
Catheter Insertion	\$ 448,09
Biopsy	\$ 381,51
TOTAL	\$ 405.972,25



Medication Cost for period





IOP-GRAACC

Coordenation-Dra. Adriana Seber

Since 1999/2012-347 HSCT

50 HSCT/year

(44%Auto, 42%Allo related,14%Unrelated)

In Patient Unit

4 rooms- 6 beds

Human resources

- 16 Nurses
- 4 Medical doctors 8h/d
- 14 technicians





Pediatric Oncology Institute (IOP)

- ✓ N=30 consecutive patients :
- ✓ Mean age =8y
- ✓ 10 autologous HSCT
- ✓ 10 allogeneic-related
- ✓ 10 unrelated
- ✓ from September 2007 to May 2011.



First Hospitalization :

- ✓ Autologous - 23d (19-29),
- ✓ Allogeneic-related - 30d (17-73)
- ✓ Unrelated HSCT - 22d (11-62)

Median time of neutrophil engraftment :

- ✓ Autologous =16d (13-31)
- ✓ Allogeneic-related =16d (0-31)
- ✓ Unrelated HSCT. =22d (12-56)



Number of Readmissions and length of stay:

autologous 2,5 (1-6) ,10d (0-65)

allogeneic-related 1,0 (1-6),6d(0-64)

unrelated HSCT 2 (1-6), 17d (2-50)

Intensive Care support =13

(1 autologous, 6 allogeneic-related and 6 unrelated).

OS:60%



The first admission had a total cost of:

Autologous median U\$22,902 (mean U\$26,884)

Allo-related median U\$41,351 (mean U\$48,891)

Unrelated HSCT median U\$64,385 (mean U\$ 80,595)



Total costs of pediatric HSCT during the first year

Autologous median U\$55,666 (mean U\$ 69,407)

Allo-related median U\$36,268 (mean U\$ 124,834)

Unrelated median U\$118,908 (mean U\$139,861)



Hospital Israelita Albert Einstein(SP)

N= 116 patients

allogeneic n = 27

autologous n= 89

Mean age =42 y

Diag:30 MM; 41 lymphomas; 22 Acute Leukemia;6 chronic leukemia ; 17 benign disease.

Pretransplantation Assesment of Mortality risk score was applied in all patients using the available web site (<http://cdsweb.fhcrc.org/pam/>).

Fábio Rodrigues Kerbauy et al.
einstein. 2012;10(1):82-5



Hospital Israelita Albert Einstein(SP)

The median cost in US dollars for each group was:

n =7 high risk \$ 281.000
n=77 intermediate risk \$ 73.300
n=32 low risk \$ 54.400

Fábio Rodrigues Kerbauy et al.
einstein. 2012;10(1):82-5



Overall Survival by risk categories

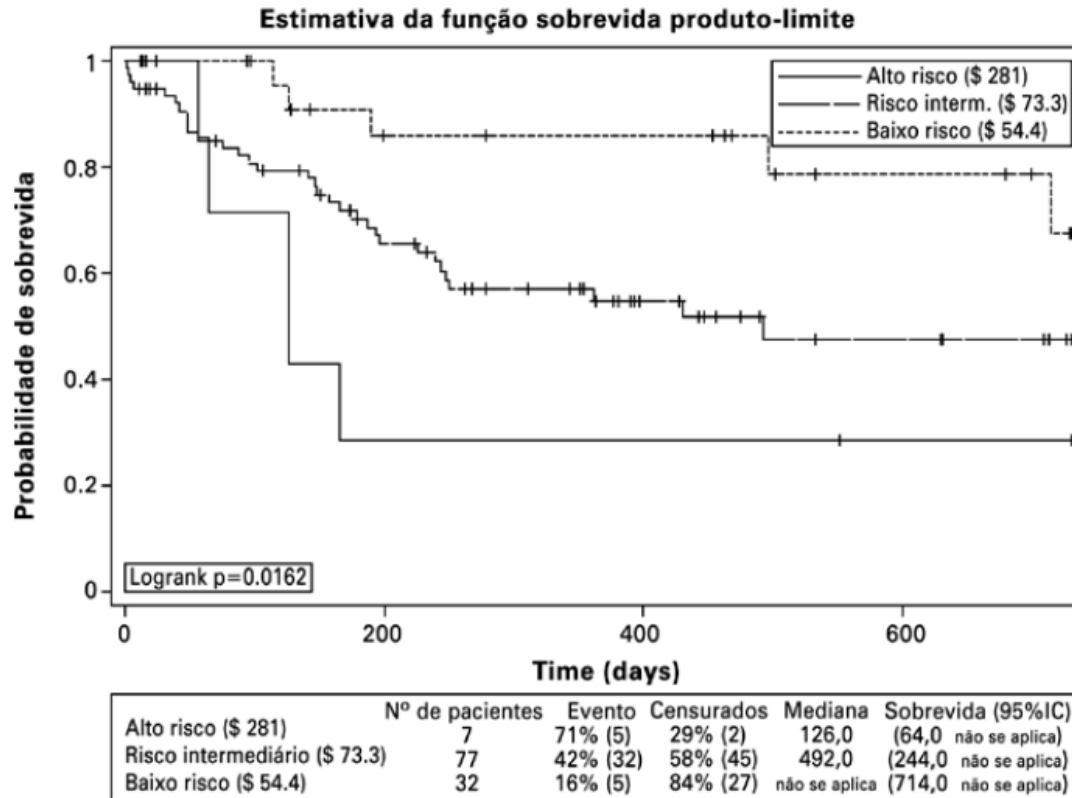


Figura 1. Curvas de Kaplan-Meier mostrando os 2 anos estimados de sobrevida geral de acordo com escore Avaliação de Mortalidade Pré-Transplante (PAM, do inglês *Pretransplantation Assessment of Mortality*) e custo do transplante em dólares americanos

Fábio Rodrigues Kerbauy et al.
einstein. 2012;10(1):82-5



These are preliminary studies, and they cannot be compared one to another, because we have a public pediatric hospital, specialized in oncology with a strong voluntary work; Santa Casa is a philanthropy foundation, which works basically with public health system, and Einstein a private Hospital.

It is urgent that the other transplant centers do their own studies on the costs, so we can identify the gaps between the cost and the reimbursement. This is very important to discuss with the government, and to the future of HSCT in Brazil.





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Clinical Data

age-years	diagnosis	risc	graft	platelet engraftment/day	neutrophil engraftment/day	first admission/day	readmissions (length of stay)	Intensive care unit	relapse	one year cost Real
22	AA	low	BM	9	15	29	duas 22/09 e 25/06/10 12 CMV	n	n	92.970,09
19	AML-M4	high	PBSC	8	16	30	18/10/11 e 28/12/11	n	n	79.976,37
49	ALL-B	interm	PBSC	8	14	10	20/10(5dias)e13/11(3dias)	y	y	56.340,93
29	NH	high	PBSC-mini	9	8	13	duas (15 dias e 15 dias)	n	y	73.815,33
28	AA	low	BM	23	25	27	uma 15 dias CMV	n	n	55.592,65
25	HPN	low	PBSC	13	15	43	no	n	n	99.315,32
44	AML-M4	interm	PBSC	12	14	23	y	n	n	43.909,13
26	ALL-Ph+	interm	PBSC	8	12	24	no	n	n	40.732,86
24	CML	low	PBSC	12	12	24	no	n	n	39.710,87
35	MDS	interm	PBSC	10	8	25	y	n	n	97.639,98