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Special report

Change in stem cell source for hematopoietic stem cell transplantation (HSCT) in Europe: a report of the EBMT activity survey 2003

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Summary:

This EBMT activity survey presents the status of hematopoietic stem cell transplantation (HSCT) in Europe 2003 and focuses on changes in stem cell source over the last decade. There were 21 028 first HSCT, 7091 allogeneic (34%), 13 937 autologous (66%) and 4179 additional re- or multiple transplants reported from 597 centers in 42 European countries in the year 2003. Main indications were leukemias (6613 (31%; 78% allogeneic)); lymphomas (11 571 (55%; 93% autologous)); solid tumors (1792 (9%; 92% autologous)) and nonmalignant disorders (898 (5%; 93% allogeneic)). In 1991, the vast majority of autologous and all allogeneic HSCT were still bone marrow (BM) transplants. Stem cell source changed rapidly to peripheral blood (PB) for autologous HSCT between 1992 and 1996. In 2003, 97% of autologous HSCT were PB derived. The change to PB for allogeneic HSCT followed 3 years later and occurred at a lower rate. In 2003, 65% of all allogeneic HSCT were PB derived. The change in stem cell source was not homogeneous. It was associated with donor type, main diagnosis, disease stage and it differed between European countries. In 2003, bone marrow remains a significant source of stem cells in some European countries for autologous HSCT and for nonmalignant disorders in allogeneic HSCT.
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Bone marrow was the primary source of stem cells for hematopoietic stem cell transplantation (HSCT) from the earliest days. Bone marrow harvesting was adequate for the collection of sufficient quantities of stem cells for durable engraftment in the majority of patients.[1–4] Bone marrow transplantation remained the sole form of HSCT for many decades even after it became known that hematopoietic stem cells were present in the peripheral blood. *In vitro* studies and animal experiments had shown that circulating peripheral blood stem cells were capable of fully repopulating a hematopoietic system.[5–8] Peripheral blood was not used clinically for two main reasons. The numbers of circulating stem cells were thought to be too low to be collected with reasonable methods for autologous and allogeneic HSCT. The numbers of contaminating T cells were considered too high for a safe allogeneic transplant. This fear was based on experience with donor buffy coat cells in the context of HSCT for severe aplastic anemia during the 1980s. The high rejection rate of bone marrow transplants in sensitized patients was successfully reduced by the addition of buffy coat cells from the bone marrow donor. The majority of these patients did engraft but suffered from severe chronic graft-versus-host disease (GVHD). Their survival was not improved and use of donor buffy coat cells was abandoned.[9–11]

The change to peripheral blood as stem cell source came about by the parallel observation of several phenomena. Patients with chronic myeloid leukemia present with high numbers of circulating stem cells. Cells collected with one or two aphereses at the time of diagnosis proved to be sufficient to restore hematopoiesis to chronic phase in patients with transformed chronic myeloid leukemia when they were given after high-dose chemotherapy and/or total body irradiation.[12,13] *In vitro* studies revealed that patients with lymphoma or solid tumors had high numbers of circulating stem cells as a rebound phenomenon after intensive chemotherapy.[14] Adequate numbers of stem cells could be collected for autologous transplantation during a well-defined time window. This rebound was accentuated by the addition of colony stimulating factors G-CSF or GM-CSF.[15] The potential of this powerful tool was quickly recognized and the combination of mobilization with growth factors after chemotherapy gained rapid acceptance. Prospective randomized studies confirmed the advantage of peripheral blood compared to bone marrow

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as a stem cell source. Today, peripheral blood is the main source[16,17] of stem cells for autologous HSCT.[2,18]

The change in stem cell source to peripheral blood for allogeneic HSCT began later and proceeded more slowly. The first trials were triggered by the excellent results of peripheral blood HSCT in the autologous setting, by animal experiments and by preliminary case reports.[2,17,19] Case studies and cord blood transplants confirmed the potential of peripheral blood as full hematopoietic stem cell source.[20,21] Safety with regard to the risk of acute and chronic GVHD remained of concern. The debate on differences in acute and chronic GVHD following either source of stem cells is still ongoing. Peripheral blood is today an accepted source for allogeneic HSCT but its final place in relation to bone marrow remains to be defined.[22–28]

In this analysis, we used data from the EBMT activity surveys from the last 14 years.[29] By chance, the EBMT activity survey was introduced just at the onset of change in stem cell source. The comprehensive data give clear information about the change and the factors associated with this change. The survey covers the current status in Europe and provides information for transplant physicians and health care providers alike.

Patients and methods

Data collection and validation

Since 1990 all EBMT members and affiliated nonmembers have been asked annually to report on a survey sheet the numbers of new patients by indication, stem cell source and donor type.[29] Furthermore, the form collects generic information on the numbers of additional re- or multiple transplants, on the percentage of cord blood HSCT and, since 1999, on the percentage of transplants with reduced intensity conditioning (RIC) HSCT. Data are validated by the reporting team, which receives a computer printout of the entered data, and by cross checking with national registries. Teams are subjected to onsite visits.

The EBMT survey was adopted by the General Assembly as a mandatory self-reporting system. It now forms an integral part of a comprehensive quality assurance programme JACIE (Joint Accreditation Committee of the International Society for Cellular Therapy ISCT and the European Group for Blood and Marrow Transplantation EBMT) (http://www.EBMT.org).[30,31]

Teams

A total of 655 teams in 42 European countries were contacted for the 2003 report, of which 597 reported their numbers. In all, 38 teams reported being inactive. This corresponds to a 97% return rate from active teams and includes 458 of the 469 active EBMT member teams reporting to the survey. In all, 20 teams known by the investigators to have been performing HSCT in 2003 were also contacted, but chose not to reply or, for unknown reasons, failed to reply despite several efforts to reach them. No major transplant team in Europe is missing from this list. Contacted teams are listed in the Appendix in alphabetical order according to country, city and EBMT center code. We received information that in 2003 no blood or marrow transplants were performed in the following European countries: Albania, Andorra, Armenia, Bosnia and Herzegovina, Georgia, Iceland, Liechtenstein, Malta, Moldavia, Monaco, San Marino and the Vatican.

Definitions

The survey lists patients and transplants separately as previously defined.[29] For the focus of this analysis on use of stem cell source, only first transplants would be considered. No information on stem cell source or indication is collected for additional transplants. Information on stem cell source was collected as bone marrow or peripheral blood. Combined bone marrow and peripheral blood transplants or cord blood transplants were considered in the analysis as peripheral blood HSCT. Information on cord blood transplants was collected only as a generic number per year for each individual team. For the purpose of this analysis, we considered the change in stem cell source as a process of diffusion of a health care technology, as defined by Rogers.[32]

For the comparison of diffusion between Eastern and Western Europe, we applied a previously used and defined selection.[18] *Eastern European countries*: Croatia, Czech Republic, Estonia, Hungary, Lithuania, Poland, Slovakia and Slovenia. *Western European countries*: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Transplant rates

Transplant rates were defined as the number of HSCT per 10 million inhabitants. They were computed by disease indication and donor type for each country, as previously defined. Transplant rates were assessed for all HSCT and separately for autologous, allogeneic and unrelated HSCT. They were also assessed for RIC allogeneic HSCT, DLI and cord blood HSCT.[33] Transplant rates refer to the number of transplants in a given country compared to its own population. The survey cannot make adjustments for patients who cross national borders and receive their HSCT in a foreign country.

In addition to absolute transplant rates, the proportion of patients transplanted with bone marrow or peripheral blood was calculated according to disease and main disease category. Population data were obtained from the US census office (http://www.census.gov).

Statistical analysis

Different statistical methods were used to analyze the data. Mean, median and standard deviations of numerical variables were calculated on an Excel spreadsheet. The shift from bone marrow to peripheral blood as the stem cell source was analyzed with descriptive statistical analysis.

Shift was considered as the diffusion of a technology and described as such.

Results

Participating teams

Of the 597 teams reporting HSCT in 2003, 341 (57%) did both allogeneic and autologous transplants; 226 (38%) restricted their activity to autologous and nine teams (2%) to allogeneic transplants only. In all, 21 teams (3%) reported having performed no transplants in 2003.

Numbers of HSCT in 2003

First transplants 2003. A total 21 028 first transplants, 7091 (34%) allogeneic and 13 937 (66%) autologous were carried out in 2003 (Table 1). This represents an increase of 1662 transplants or an increase of 8% compared to 2000, when there were 19 366 first transplants (6456 allogeneic, 12 910 autologous). Numbers of allogeneic HSCT increased by 9% from 6456 in 2000 to 7091 in 2003; numbers of autologous HSCT by 7% from 12 910 in 2000 to 13 937 in 2003.

Transplant rates were different between European countries, as presented in Figure 1 for all transplants

Table 1 Number of patients treated in Europe during the year 2003 with a first hematopoietic stem cell transplant listed by indication, donor type and stem cell source

Activity survey 2003 TEAMS = 597	*Donor source No. of patients*												
	Allogeneic												
	Family												
	HLA-id		*Non-id*		*Twin*		*Unrelated*		*Autologous*		*Total*		
	BM	*PB*	*BM*	*PB*	*BM*	*PB*	*BM*	*PB*	*BM*	*PB*	*Allo*	*Auto*	*Total*
Leukemias	835	2010	41	259	11	18	786	1190	115	1348	5150	1463	6613
Acute myeloid leukemia	325	949	14	127	3	11	252	482	89	887	2163	976	3139
1st complete remission	249	636	7	34	1	8	119	175	72	747	1229	819	2048
Not 1st complete remission	76	313	7	93	2	3	133	307	17	140	934	157	1091
Acute lymphoblastic leukemia	294	358	8	82	3	2	262	324	24	216	1333	240	1573
1st complete remission	179	201	4	28	2	1	89	155	16	164	659	180	839
Not 1st complete remission	115	157	4	54	1	1	173	169	8	52	674	60	734
Chronic myeloid leukemia	128	285	11	29	4	1	159	174	0	22	791	22	813
Chronic phase	104	190	7	12	4		100	93		6	510	6	516
Not 1st chronic phase	24	95	4	17		1	59	81		16	281	16	297
Myelodysplastic syndrome	76	298	7	18	1	4	107	172	1	34	683	35	718
Chronic lymphocytic leukemia	12	120	1	3			6	38	1	189	180	190	370
Lymphoproliferative disorders	107	498	5	13	0	7	74	151	187	10 529	855	10 716	11 571
Myeloma	29	157				4	14	43	37	4934	247	4971	5218
Hodgkin's lymphoma	12	60	1	2			12	23	53	1363	110	1416	1526
Non Hodgkin lymphoma	66	281	4	11		3	48	85	97	4232	498	4329	4827
Solid tumors	9	105	1	5	0	1	5	10	58	1598	136	1656	1792
Neuroblastoma	3			2					21	286	5	307	312
Glioma									2	46	0	48	48
Soft tissue sarcoma	2	3							2	111	5	113	118
Germinal tumors		1							8	286	1	294	295
Breast cancer		15								209	15	209	224
Ewing				1		1			5	228	2	233	235
Lung cancer		4							1	16	4	17	21
Ovarian cancer		3							1	67	3	68	71
Renal cancer	4	53	1				2	5		28	65	28	93
Melanoma		4		1						3	5	3	8
Colon cancer		15		1						1	16	1	17
Other solid tumors		7					3	5	18	317	15	335	350
Non malignant disorders	343	152	43	50	2	1	154	94	3	56	839	59	898
Severe aplastic anemia + Fanconi	154	83	11	10	2	1	67	39		0	367	0	367
Thalassemia	107	51	4	4			21	2		0	189	0	189
SCID	32	5	18	23			21	22		0	121	0	121
Inborn errors	44	11	8	11			44	26		1	144	1	145
Auto immune disease	6	2	2	2			1	5	3	55	18	58	76
Others	31	27	4	6			28	15	1	42	111	43	154
Total	1325	2792	94	333	13	27	1047	1460	364	13 573	7091	13 937	21 028

(Figure 1a), autologous HSCT (Figure 1b) or allogeneic HSCT (Figure 1c). Transplant rates are also shown for countries affiliated with EBMT.

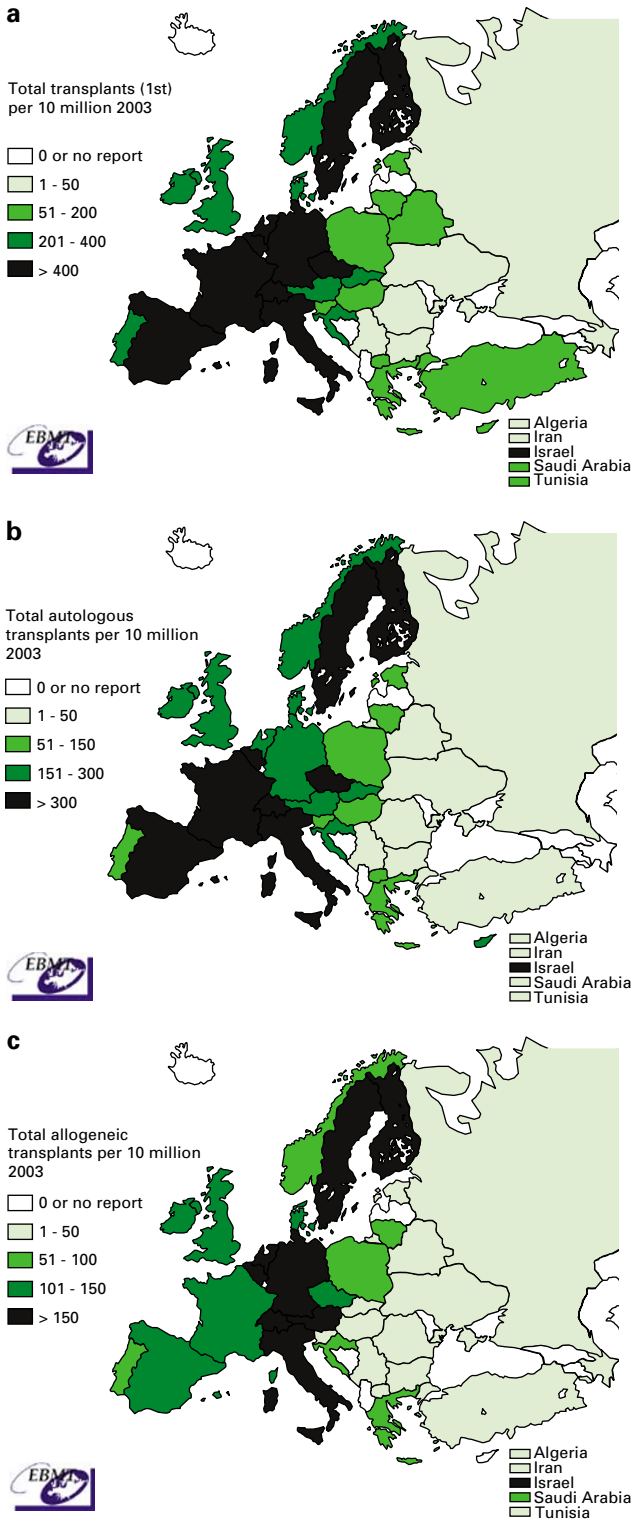

Figure 1 Transplant rates (per 10 million inhabitants) in European countries in 2003. (**a**) All HSCT combined. (**b**) Autologous HSCT only. (**c**) Allogeneic HSCT only.

Additional transplants 2003. There were 1614 additional re-transplants (898 allogeneic/716 autologous) and 2565 additional multiple transplants (396 allogeneic/2169 autologous). Thus, there was a total of 25 207 HSCT procedures, 8385 allogeneic (33%) and 16 822 autologous (67%), performed in 2003. This corresponds to an increase of 33% in re-transplants compared to 2000 or in 539 re-transplants (270 allogeneic/269 autologous) more and to an increase of 20% in multiple transplants compared to 2000 or in 510 multiple transplants (334 allogeneic/176 autologous) more. Owing to the design of the survey, no disease specific information can be given on the additional transplants.

RIC allogeneic HSCT. There were 2262 allogeneic RIC HSCT in 2003. This corresponds to 27% of all allogeneic HSCT. The trend for RIC appears to be stabilizing since 2002.[34]

Indications and donor type

Indications for HSCT in 2003 are listed in detail by donor type and stem cell source in Table 1. In summary, main indications were *lymphoproliferative disorders* with 11 571 patients (55%), 855 patients with allogeneic HSCT (7%), 10 716 with autologous HSCT (93%); *leukemias* with 6613 patients (31%), 5150 patients with allogeneic (78%), 1463 with autologous (22%) HSCT; *solid tumors* with 1792 patients (9%), 136 with allogeneic HSCT (8%), 1656 with autologous HSCT (92%) and *nonmalignant disorders* with 898 patients (5%), 839 with allogeneic HSCT (93%), 59 with autologous HSCT (7%). The latter, autologous HSCT for nonmalignant disorders, predominantly include patients with autoimmune disorders. An additional 154 patients, 111 with allogeneic HSCT and 43 with autologous HSCT, were listed as 'other indications'.

For the 7091 allogeneic first transplants, HLA-identical siblings were used as donors for 4117 (58%) of the recipients, other family members for 427 (6%) of the recipients, a syngeneic twin for 40 (1%) of the recipients and an unrelated volunteer donor for 2507 (35%) of the recipients. There was a continuing increase of unrelated HSCT from 1959 in 2000 to 2507 in 2003. Alternative donors were primarily used for patients with leukemias or nonmalignant disorders.

Stem cell source

Of the 13 937 autologous first transplants, 364 (3%) were bone marrow derived, 13 573 (97%) from peripheral blood stem cells or from combined bone marrow and peripheral blood (137 patients) stem cell transplants (Table 1). Of the 7091 allogeneic first transplants, 35% were bone marrow and 65% were peripheral blood stem cell transplants. The proportion of peripheral blood as stem cell source varied depending on donor type. It was 68% for HLA-identical sibling donor transplants, 78% for HSCT from other family members, 68% for twin donors and 58% for unrelated donors.

A total 189 allogeneic HSCT were cord blood transplants in 2003. This corresponds to 2% of all allogeneic transplants.

Changes in stem cell source 1991–2003. Information on stem cell source has been available since 1991. At that time a few peripheral blood autologous HSCT were performed but no allogeneic HSCT as yet. Within 6 years, absolute numbers of autologous peripheral blood HSCT increased from about 400 to more than 12 000 from 1997 on, while autologous bone marrow HSCT declined from near 2400 to less than 400. The proportion of autologous peripheral blood HSCT increased rapidly during the same time from 15% to >90% (Figure 2). Allogeneic peripheral blood HSCT was first reported in 1993. They continued to increase steadily to an absolute number of more than 4500 in 2003. Bone marrow transplants increased initially up to the year 1998 but in absolute numbers were still higher in 2003 (2479) than in 1991 (2175). The proportion of peripheral blood HSCT increased from <1% in 1993 to 65% in 2003 (Figure 2).

The change in stem cell source varied for the different donor types for allogeneic HSCT. It was first and most used in twin and nonidentical family donors. Use of peripheral blood for unrelated donors began with a delay of almost 4 years and is still used 10% less than in HLA-identical sibling transplants.

The change in stem cell source differed between European countries. Diffusion of peripheral blood as stem cell source for autologous HSCT occurred earlier in Western than in Eastern European countries, at a higher initial speed and to a greater extent. Bone marrow remained a substantial source of stem cell for autologous HSCT in some European countries even in 2003 (Figure 3a). The difference in diffusion of peripheral blood as stem cell source for allogeneic HSCT was less pronounced between Western and Eastern European countries, but there remained substantial differences in the proportion of bone marrow or peripheral blood as stem cell source between European countries (Figure 3b).

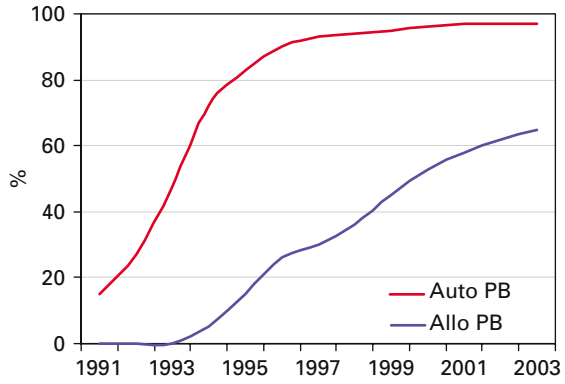

Figure 2 Diffusion of peripheral blood as stem cell source for HSCT in Europe from 1991 to 2003. Graphs represent percentage of peripheral blood as stem cell source amongst all autologous (auto PB) or allogeneic (allo PB) HSCT.

The change in stem cell source differed for the main disease categories and for disease stage. The change to peripheral blood occurred earlier, and its use remains higher in autologous HSCT for lymphoproliferative disorders and solid tumors than for leukemias or nonmalignant diseases (Figure 4a). For allogeneic HSCT, peripheral blood was applied earlier and was used to a greater extent for patients with lymphoproliferative disorders and solid tumors, its use was lowest for patients with nonmalignant disorders (Figure 4b). There was no difference in use of peripheral blood between severe aplastic anemia and other nonmalignant disorders. Within the disease categories, there was no difference in use of peripheral blood for patients with early disease (1st complete remission of acute leukemia or 1st chronic phase of chronic myeloid leukemia) compared to patients with advanced disease not in 1st remission or 1st chronic phase in autologous HSCT. This contrasts with allogeneic HSCT where patients with advanced disease were earlier and more frequently treated with peripheral blood as the stem cell source.

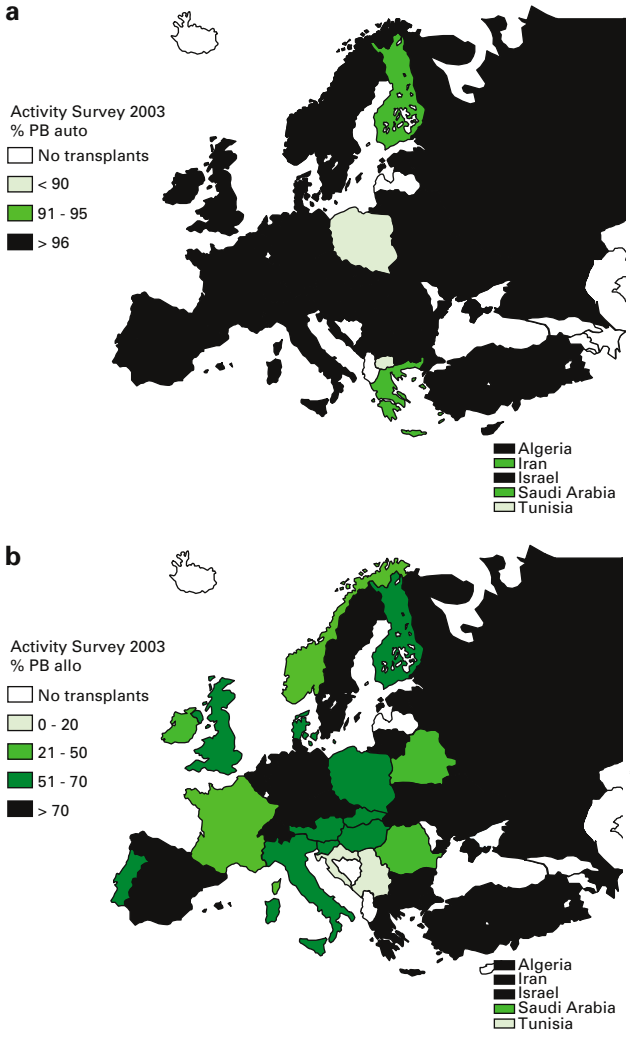

Figure 3 Use of stem cell source in Europe 2003. Maps represent percentage of peripheral blood as stem cell source for HSCT. (**a**) Autologous HSCT. (**b**) Allogeneic HSCT.

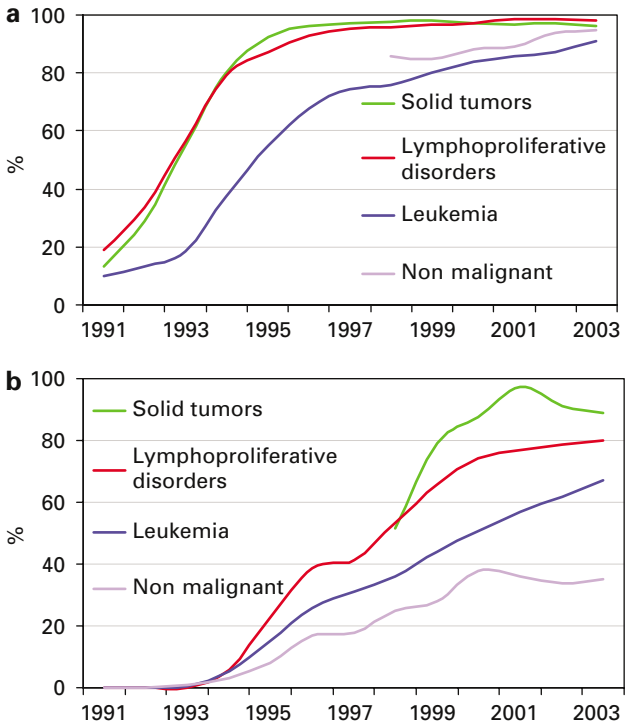

Figure 4 Diffusion of peripheral blood as stem cell source for HSCT in Europe from 1991 to 2003 according to main disease. Graphs represent percentage of peripheral blood as stem cell source for HSCT. (**a**) Autologous HSCT; main disease categories. (**b**) Allogeneic HSCT; main disease categories.

Discussion

This review of transplant activity in Europe 2003 with emphasis on use of stem cell source shows some novel aspects on the use of bone marrow or peripheral blood and documents the current status of HSCT in Europe. HSCT remains an established therapy.[1,2,30] Allogeneic HSCT continue to increase at a rate of almost 10% per year, and autologous HSCT procedures maintain a plateau at the same level as last year.[35] There remain major differences in transplant rates between European countries which are in part explained by economic factors and differences in medical opinion, as reported earlier.[33,35] This report shows some marked differences in the change from bone marrow to peripheral blood as the stem cell source. It cannot give explanations but the descriptive statistics can be used to generate some hypotheses.

The results of this survey document the almost complete shift from bone marrow to peripheral blood as stem cell source for *autologous* HSCT within a decade and clarify some of the factors associated with this change. Diffusion of this change in Europe was earlier and more rapid in Western than in Eastern Europe, and was earlier and more complete for lymphoproliferative disorders and for solid tumors, and was similar for patients with early or advanced disease stage. The rapid change and almost complete diffusion is no surprise. Early prospective randomized studies documented the clear advantage of peripheral blood as the stem cell source.[16,17] There was a more rapid recovery with peripheral blood, a lower need for transfusions and antibiotics and a shorter hospital stay. There was no obvious disadvantage; the postulated higher contamination rate of peripheral blood with tumor cells was not confirmed.[36] However, bone marrow remains the source for HSCT in a substantial proportion of patients, mainly in Eastern European countries. Peripheral blood collection depends on an infrastructure with cell separators and growth factors. In countries where manpower is less costly than machines or drugs, bone marrow might appear more affordable than peripheral blood as stem cell source, even though cost effectiveness analyses in Western European countries showed a cost benefit advantage for peripheral blood.[37]

The pattern is different for *allogeneic* HSCT.[38] Diffusion began later than for autologous HSCT, with less speed, similar in Eastern and Western Europe but with big differences between European countries and big differences with regard to donor type, disease and disease stage. In contrast to autologous HSCT, conclusions about advantage and disadvantage of peripheral blood compared to bone marrow are less clear. There is unequivocal evidence that engraftment is more rapid with peripheral blood.[22–28] This translates into an early survival advantage for patients with advanced disease. It is also becoming clear that peripheral blood is associated with an increased risk of acute and chronic GVHD. The final balance between the beneficial effect of graft-versus-leukemia effects and reduced relapse risk, and the detrimental effects of GVHD on transplant related mortality, still need to be defined. This dilemma is reflected by the data of this analysis. Use of peripheral blood is higher in patients with advanced leukemias compared to patients in 1st complete remission. Use of peripheral blood is also lower in patients with nonmalignant disorders, where conceivably no benefit can be derived from a graft-versus-host effect. Despite these considerations, the data show an increasing trend towards use of peripheral blood for nonmalignant disorders over the most recent years. Peripheral blood is also more frequently used for lymphoproliferative disorders and solid tumors; most likely this reflects the increasing use of RIC HSCT in these conditions.[39,40] Risk of rejection has been reported to be lower with the use of peripheral blood in RIC HSCT.[41]

In contrast to autologous HSCT, allogeneic HSCT procedures involve two individuals, the recipient and the donor. Concerns about the side effects of growth factors initially restricted the use of peripheral blood in unrelated donors; this is again reflected in this survey. Early data have confirmed the safety of both approaches for donors but have also clarified a different pattern of side effects.[25,26,42,43] Bone marrow donation is mainly associated with side effects at the harvest site and anemia, peripheral blood donation mainly with side effects of the growth factors and the apheresis procedure. Fever and flu-like symptoms are frequent, mild side-effects of growth factor application, hypovolemia and hypocalcemia are frequent mild side-effects of apheresis. Depending on their preferences donors might choose to have peripheral blood stem cell collection as an outpatient without the need for anesthesia or to have a rapid bone marrow collection without the need for growth factor administration. Both collection methods are associated with a low but not negligible risk of major

complications and potentially death. Thromboembolic events have been reported after bone marrow harvest, vascular events and splenic rupture after peripheral blood donation. No difference in incidence of late malignancies has been observed so far for donors with either methods.[43]

The rapid change of stem cell source reveals an additional problem. Current quality management guidelines for stem cell transplantation by the international organizations JACIE (www.EBMT.org) and FACT (www.FACT.org) require documentation of proficiency for stem cell collection. Teams performing mainly autologous HSCT or only lower numbers of allogeneic HSCT might soon lack the necessary expertise for bone marrow harvesting in those situations where it is actually needed. Novel concepts, such as teams covering bone marrow harvests for larger regions that might even cross national borders, are required. This will present a challenge to health care providers or insurance companies.

This EBMT activity survey gives no results on outcome. Such data are published elsewhere and with longer follow-up. Thanks to its rapid distribution, this survey describes current practice of HSCT in Europe and provides a basis for transplant specialists, health care administrators, patients and donors in their decision-making.

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References

1 Thomas ED, Lochte Jr HL, Lu WC, Ferrebee JW. Intravenous infusion of bone marrow in patients receiving radiation and chemotherapy. *N Engl J Med* 1957; **257**: 491–496.
2 Thomas ED. Bone marrow transplantation: a review. *Semin Hematol* 1999; **36** (Suppl 7): 95–103.
3 Horowitz MM. Uses and growth of hematopoietic cell transplantation. In: Forman SJ, Blume KG, Thomas ED (eds). *Hematopoietic Cell Transplantation*, 3rd edn. Blackwell Scientific Publishers Inc.: London, New York, 2003, pp 9–15.
4 Thomas ED, Storb R, Clift RA *et al*. Bone-marrow transplantation (second of two parts). *N Engl J Med* 1975; **292**: 895–902.
5 Goodman JW, Hodgson GS. Evidence for stem cells in the peripheral blood of mice. *Blood* 1962; **19**: 702–714.
6 Barnes DW, Loutit JF. Haemopoietic stem cells in the peripheral blood. *Lancet* 1967; **2**: 1138–1141.
7 Storb R, Epstein RB, Ragde H *et al*. Marrow engraftment by allogeneic leukocytes in lethally irradiated dogs. *Blood* 1967; **30**: 805–811.
8 McCredie KB, Hersh EM, Freireich EJ. Cells capable of colony formation in the peripheral blood of man. *Science* 1971; **171**: 292–294.
9 Anasetti C, Storb R, Longton G *et al*. Donor buffy coat cell infusion after marrow transplantation for aplastic anemia. *Blood* 1988; **72**: 1099–1100.
10 Goerner M, Gooley T, Flowers ME *et al*. Morbidity and mortality of chronic GVHD after hematopoietic stem cell transplantation from HLA-identical siblings for patients with aplastic or refractory anemias. *Biol Blood Marrow Transplant* 2002; **8**: 47–56.
11 Thomas ED, Fefer A. Graft-versus-host disease. *N Engl J Med* 1979; **301**: 556.
12 Goldman JM, Catovsky D, Hows J *et al*. Cryopreserved peripheral blood cells functioning as autografts in patients with chronic granulocytic leukaemia in transformation. *BMJ* 1979; **1**: 1310–1313.
13 Haines ME, Goldman JM, Worsley AM *et al*. Chemotherapy and autografting for chronic granulocytic leukaemia in transformation: probable prolongation of survival for some patients. *Br J Haematol* 1984; **58**: 711–721.
14 Richman CM, Weiner RS, Yankee RA. Increase in circulating stem cells following chemotherapy in man. *Blood* 1976; **47**: 1031–1039.
15 Socinksi MA, Cannistra SA, Elias A *et al*. Granulocyte-macrophage colony stimulating factor expands the circulating haemopoietic progenitor cell compartment in man. *Lancet* 1988; **1**: 1194–1198.
16 Schmitz N, Linch DC, Dreger P *et al*. Randomised trial of filgrastim-mobilised peripheral blood progenitor cell transplantation *vs* autologous bone-marrow transplantation in lymphoma patients. *Lancet* 1996; **347**: 353–357. Erratum in: *Lancet* 1996; **347**: 914.
17 Korbling M, Fliedner TM. The evolution of clinical peripheral blood stem cell transplantation. *Bone Marrow Transplant* 1996; **17** (Suppl 2): S4–S11.
18 Gratwohl A, Baldomero H, Labar B *et al*. Accreditation Committee of the European Group for Blood and Marrow Transplantation (EBMT). Evolution of hematopoietic stem cell transplantation in Eastern and Western Europe from 1990 to 2003. A report from the EBMT activity survey. *Croat Med J* 2004; **45**: 689–694.
19 Kessinger A, Smith DM, Strandjord SE *et al*. Allogeneic transplantation of blood-derived, T cell-depleted hemopoietic stem cells after myeloablative treatment in a patient with acute lymphoblastic leukemia. *Bone Marrow Transplant* 1989; **4**: 643–646.
20 Gluckman E, Broxmeyer HA, Auerbach AD *et al*. Hematopoietic reconstitution in a patient with Fanconi's anemia by means of umbilical-cord blood from an HLA-identical sibling. *N Engl J Med* 1989; **321**: 1174–1178.

21 Cohen Y, Nagler A. Umbilical cord blood transplantation – how, when and for whom? *Blood Rev* 2004; **18**: 167–179.
22 Champlin RE, Schmitz N, Horowitz MM *et al*. Blood stem cells compared with bone marrow as a source of hematopoietic cells for allogeneic transplantation. *Blood* 2000; **95**: 3702–3709.
23 Powles R, Metha J, Kulkarni S *et al*. Allogeneic blood and bone marrow stem cell transplantation in hematological malignant diseases: a randomized trial. *Lancet* 2000; **355**: 1231–1237.
24 Blaise D, Kuentz M, Fortanier C *et al*. Randomized trial of bone marrow *vs* lenogastrim-primed blood cell allogeneic transplantation in patients with early-stage leukemia: a report from the Societe Francaise de Greffe de Moelle. *J Clin Oncol* 2000; **18**: 537–546.
25 Bensinger WI, Martin PJ, Storer B *et al*. Transplantation of bone marrow as compared with peripheral blood cells from HLA-identical relatives in patients with hematologic cancers. *N Engl J Med* 2001; **344**: 175–181.
26 Schmitz N, Beksac M, Hasenclever D *et al*. Transplantation of mobilized peripheral blood cells to HLA-identical siblings with standard risk leukemia. *Blood* 2002; **100**: 761–767.
27 Couban S, Simpson DR, Barnett MJ *et al*. A randomized multicenter comparison of bone marrow and peripheral blood in recipients of matched sibling allogeneic transplants for myeloid malignancies. *Blood* 2002; **100**: 1525–1531.
28 Ringden O, Labopin M, Bacigalupo A *et al*. Transplantation of peripheral blood stem cells as compared with bone marrow from HLA-identical siblings in adults with acute myeloid leukemia and acute lymphoblastic leukemia. *J Clin Oncol* 2002; **20**: 4655–4664.
29 Gratwohl A. Bone marrow transplantation activity in Europe 1990. Report from the European Group for Bone Marrow Transplantation (EBMT). *Bone Marrow Transplant* 1991; **8**: 197–201.
30 Urbano-Ispizua A, Schmitz N, de Witte T *et al*. Allogeneic and autologous transplantation for haematological diseases, solid tumours and immune disorders: definitions and current practice in Europe. *Bone Marrow Transplant* 2002; **29**: 639–646.
31 Kvalheim G, Urbano-Ispizua A, Gratwohl A. Regulatory aspects and accreditation of the clinical use of hematopoietic progenitor cells in Europe. *J Biol Regul Homeost Agents* 2001; **15**: 79–80.
32 Rogers EM. *Diffusion of innovations*, 3rd edn. The Free Press: New York, 1983.
33 Gratwohl A, Passweg J, Baldomero H *et al*. for the Accreditation Committee of the European Group for Blood and Marrow Transplantation (EBMT). Economics, health care systems and utilisation of haematopoietic stem cell transplants in Europe. *Br J Haematol* 2002; **117**: 451–468.
34 Gratwohl A, Baldomero H, Passweg J, Urbano-Ispizua for the Accreditation Committee of the European Group for Blood and Marrow Transplantation (EBMT). Increasing use of reduced intensity conditioning transplants: report of the 2001 EBMT activity survey. *Bone Marrow Transplant* 2002; **30**: 813–831.
35 Gratwohl A, Schmid O, Baldomero H *et al*. Accreditation Committee of the European Group for Blood and Marrow Transplantation. Haematopoietic stem cell transplantation (HSCT) in Europe 2002. Changes in indication and impact of team density. A report of the EBMT activity survey. *Bone Marrow Transplant* 2004; **34**: 855–875.
36 De la Rubia J, Sanz MA. Autologous peripheral blood stem cell transplantation for acute leukaemias. *Baillieres Best Pract Res Clin Haematol* 1999; **12**: 139–150.
37 Uyl-de Groot CA, Ossenkoppele GJ, Buijt I, Huijgens PC. Costs of peripheral blood progenitor cell transplantation using whole blood mobilised by filgrastim as compared with autologous bone marrow transplantation in non-Hodgkin's lymphoma. *Pharmacoeconomics* 1999; **15**: 305–311.
38 Russell N, Gratwohl A, Schmitz N. The place of blood stem cells in allogeneic transplantation. *Br J Haematol* 1996; **93**: 747–753.
39 Barrett J, Childs R. Non-myeloablative stem cell transplants. *Br J Haematol* 2000; **111**: 6–17.
40 Slavin S. Smarter rather than stronger treatment of haematological malignancies and non-malignant indications for stem-cell transplantation. *Lancet* 2004; **364**: 122–124.
41 Haddad N, Rowe JM. Current indications for reduced-intensity allogeneic stem cell transplantation. *Best Pract Res Clin Haematol* 2004; **17**: 377–386.
42 Anderlini P, Przepiorka D, Seong D *et al*. Clinical toxicity and laboratory effects of granulocyte-colony-stimulating factor (filgrastim) mobilization and blood stem cell apheresis from normal donors, and analysis of charges for the procedures. *Transfusion* 1996; **36**: 590–595. Erratum in: *Transfusion* 1997; **37**: 109.
43 Favre G, Beksac M, Bacigalupo A *et al*. European Group for Blood and Marrow Transplantation (EBMT). Differences between graft product and donor side effects following bone marrow or stem cell donation. *Bone Marrow Transplant* 2003; **32**: 873–880.

Appendix

List of transplant centres in 2003

Albania: no report
Andorra: no report
Armenia: no report

Algeria (1 team; 128 (132), 99/29)
Alger, Centre Pierre et Marie Curie, CIC 703, R Hamladji (128 (132), 99/29)

Austria (15 teams; 319 (406), 134/185)
Graz, Karl Franz University Hospital (onco), CIC 278, H Samonigg (0 (0), 0/0)
Graz, Karl Franz University Hospital (hem), CIC 308, W Linkesch (52 (65), 16/36)
Graz, Universitäts-Kinderklinik (hem, onco), CIC 593, Ch Urban (9 (10), 5/4)
Innsbruck, Universitätsspital (hem,onco), CIC 271, G Gastl, D Nachbaur (51 (68), 33/18)
Innsbruck, Universitätsspital, Internal Medicine (onco), CIC 516, E Woell (0 (0), 0/0)
Klagenfurt, General Hospital Klagenfurt, D Geissler, M Heistinger (5 (8), 0/5)
Linz, AO Krankenhaus (onco), 1 Medizin, MA Fridrik (4 (4), 0/4)
Linz, AOK der Elisabethinen, Internal Medicine, CIC 594, D Lutz, O Krieger (31 (43), 11/19)
Salzburg, LKA Salzburg (onco), CIC 356, R Greil (6 (10), 0/6)
Vienna, AKH, Universitätsklinik für Innere Medizin I (onco), CIC 227, HT Greinix, P Kalhs (82 (91), 38/44)
Vienna-Lainz, Krankenhaus der Stadt Wien-Lainz, 5 Med Onko, K Geissler, E Ulsperger (0 (0), 0/0)
Vienna, St Anna Kinderspital (hem, onco), CIC 528, H Gadner, C Peters (42 (45), 30/12)
Vienna, Hanusch-Krankenhaus (hem,onco), CIC 743, E Pittermann, E Koller (10 (13), 0/10)
Vienna, Donauspital, CIC 767, W Hinterberger (9 (15), 0/9)
Vienna, Wilhelminenspital (hem, onco), CIC 828, H Ludwig (18 (34), 0/18)

Azerbaijan (1 team; 1 (1), 1/0)
Baku, Azerbaijan Central Clinic Hospital, CIC 186, S Dincer (1 (1), 1/0)

Belarus, Republic of (2 teams; 66 (71), 17/49)
Minsk, Belorussian Center (hem, onco, peds), CIC 591, O Aleinikova (29 (31), 6/23)
Minsk, Hospital No 9, N Milanovitch (37 (40), 11/26)

Belgium (21 teams; 552 (687), 183/369)
Antwerpen, Stuivenberg ZH, CIC 339:1, P Zachée (37 (52), 6/31)
Antwerpen-Edegem, University Antwerpen (hem), CIC 339:2, W Schroyens (21 (28), 3/18)
Antwerpen, AZ Middelheim (hem), CIC 783, R de Bock (5 (6), 0/5)
Brugge, AZ St Jan (hem), CIC 506, D Selleslag, A Van Hoof, J Van Droogenbroeck, K Van Eygen (45 (58), 16/29)
Brussels, Institut Jules Bordet and the Children's University Hospital, CIC 215, D Bron, E Sariban, C Devalck, A Ferster (46 (70), 25/21)
Brussels, Clinique universitaire St Luc (hem, ads), CIC 234, A Ferrant (38 (43), 20/18)
Brussels, Clinique Universitaire St Luc (peds), CIC 234, C Vermylen (16 (17), 13/3)
Brussels, Cliniques Universitaires St Luc, (onco), JP Machiels (2 (3), 0/2)
Brussels, Hôpital Erasme (hem), CIC 596, W Feremans, A Kentos, M Lambermont, A Deweiwere (18 (21), 0/18)
Brussels, University Hospital (hem, onco), CIC 630, B Van Camp, Schots (20 (26), 9/11)
Brussels, The Clinic of Europe, CIC 779, C Dubois, C Laurent, S Marichal (0 (0), 0/0)
Charleroi, Hopital Notre-Dame (hem, onco), CIC 349, M André (13 (14), 1/12)
Charleroi, University Hospital (hem), CIC 804, A Triffet (8 (9), 0/8)
Gent, University Hospital (hem, ads, peds), CIC 744, LA Noens (41 (42), 20/21)
Haine St Paul, Hôpital de Jolimont (hem), CIC 234, A Delannoy, C Ravoot, N Straetmans (22 (24), 2/20)
Hasselt, Virgajesse Ziekenhuis (hem), CIC 632, D Vanstraelen, G Bries, V Madoe (31 (36), 0/31)
Leuven, University Hospital Gasthuisberg (hem, ads,peds), CIC 209, MA Boogaerts, P Vandenberghe, J Maertens (91 (112), 38/53)
Liège, CHR La Citadelle (hem, onco), CIC 353, B De Prijck (11 (14), 0/11)
Liège, University Hospital Sart-Tilman (hem), CIC 726, Y Béguin (44 (61), 24/20)
Roeselare, H Hartziekenhuis (hem,onco), CIC 646, F Van Aelst, J Tytgat, J Demol (14 (15), 1/13)
Yvoir, Clinique universitaire de Mont-Godinne (hem), CIC 234, C Doyen (29 (36), 5/24)

Bosnia-Herzegovina (1 team; 0 (0), 0/0)
Tuzla, University Clinical Centre of Tuzla (hem), M Malesevic (0 (0), 0/0)

Bulgaria (1 team; 15 (15), 6/9)
Sofia, Uni Hospital 'Queen Johanna' (peds hem-onco), CIC 346, D Bobev (15 (15), 6/9)

Croatia (2 teams; 110 (127), 25/85)
Zagreb, Clinic Hospital 'Merkur', CIC 159, B Jaksic, H Minigo (32 (34), 6/26)
Zagreb, Clinical Hospital Center, CIC 302, B Labar, D Nemet, M Mrsic (78 (93), 19/59)

Cyprus (1 team; 12 (12), 0/12)
Nicosia Makarious Hospital lll (hem), CIC 575, N Papaminas (12 (12), 0/12)

Czech Republic (10 teams; 503 (619), 142/361)
Brno, Masaryk University Hospital (ads, peds, hem, onco), CIC 597, J Vorlicek, J Mayer, Z Koristek (92 (126), 29/63)
Hradec Kralové, Charles University (hem), CIC 729, S Filip, M Blaha (42 (46), 6/36)
Olomouc, University Hospital (hem, onco), CIC 574, K Indràk (57 (60), 7/50)
Pilsen, Faculty Hospital (hem, onco), CIC 718, V Koza (73 (93), 36/37)
Prague, Clinical Haematology, Charles University, CIC 318, T Kozak (46 (50), 0/46)
Prague, Thomayer Memorial Hospital, CIC 375, J Abrahamova, J Nepomucka (16 (16), 0/16)
Prague, University Hospital Motol (peds hem), CIC 656, J Stary, E Kabickova (42 (54), 38/4)
Prague, University Hospital Motol (peds onco), E Kabickova, CIC 656 (14 (35), 0/14)
Prague, Institute of Hematology and Blood Transfusion, CIC 656, A Vitek, P Kobylka (44 (46), 26/18)
Prague, Charles University, CIC 745, M Trneny (77 (93), 0/77)

Denmark (3 teams; 209 (234), 58/151)
Aarhus, Amtssygehus (hem), CIC 634, E Segel (53 (54), 0/53)
Copenhagen, Rigshospitalet (hem), CIC 206, N Jacobsen (123 (142), 58/65)
Copenhagen, Herlev Hospital (hem), University, CIC 568, HE Johnsen (33 (38), 0/33)

Estonia (1 team; 12 (12), 4/8)
Tartu, University Hospital (hem, onco), CIC 746, H Everaus, A Kaare (12 (12), 4/8)

Finland (7 teams; 274 (310), 116/158)
Helsinki, Children's Hospital, CIC 219, U Pihkala, S Vettenranta (30 (33), 23/7)
Helsinki, University Central Hospital, Department of Medicine, CIC 515, T Ruutu (120 (133), 76/44)
Helsinki, University Hospital (onco), CIC 833, H Joensuu, R Janes (7 (7), 0/7)
Kuopio, Department of Medicine, University Hospital, CIC 396, E Jantunen, T Nousiainen (22 (22), 0/22)
Oulu, University Central Hospital (hem, onco), CIC 690, P Koistinen, T Turpeenniemi-Hujanen (20 (25), 0/20)
Tampere, University Hospital (ads, peds), CIC 635, E Koivunen, T Lehtinen, R Silvennoinen, M Arola (39 (47), 0/39)
Turku, University Central Hospital, CIC 225, K Remes (36 (43), 17/19)

France (75 teams; 2902 (3616), 717/2185)
Angers, Centre Hospitalier, CIC 650, N Ifrah, S François (51 (69), 7/44)
Angers, Paul Papin, Dr Gamelin*
Argenteuil, Centre hospitalier, M Urbajtel (15 (15), 7/8)
Besançon, Hôpital Jean Minjoz & Hôpital St Jacques (ads, peds), CIC 233, J-Y Cahn, P Herve, E Deconinck, PRohrlich (55 (69), 25/30)
Bobigny, Hôpital Avicenne (hem), P Casassus (22 (22), 0/22)
Brest, Centre Hospitalier, C Berthou*
Caen, Centre Hospitalier Régional, O Reman (21 (24), 3/18)
Caen, Hôpital Cote de Nacre (peds hem onco), P Boutard (1 (1), 0/1)
Caen, Centre Régional François Baclesse, AM Peny (30 (41), 0/30)
Clermont Ferrand, Centre Jean Perrin and CHU Hotel Dieu (ads, peds), CIC 273 + 589, J-O Bay, F Démeocq, P Travade (100 (125), 26/74)
Colmar, Hôpital civil, B Audhuy (13 (14), 0/13)
Corbeil Essonne, Hôpital Gilles de Corbeil, A Devidas (11 (11), 0/11)
Créteil, Hôpital H Mondor (hem), CIC 252, C Cordonnier, M Kuentz (43 (46), 20/23)
Dijon, Hôpital d'Enfants, D Caillot (51 (64), 0/51)
Dunkerque, Centre Hospitalier (hem), M Wetterwald*
Grenoble, Centre Hospitalier A Michallon (ads, allo peds), CIC 270, JJ Sotto, F Garban, P Drillat (65 (90), 22/43)
Grenoble, Centre Hospitalier (auto peds), D Plantaz, M Bost (6 (6), 4/2)
Lille, Hôpital Claude Huriez, CIC 277, F Bauters, JP Jouet (75 (93), 36/39)
Lille, Hôpital Jeanne de Flandre, Dr Nelken (1 (1), 0/1)
Lille, Centre Oscar Lambret (onco), Dr Depadt, Dr Defachelles (20 (20), 0/20)
Lille, Centre Hospitalier Saint Vincent, N Cambier (15 (17), 0/15)
Limoges, Centre Hospitalier Dupuytren (ads, hem), CIC 977, D Bordessoule, P Turlure (39 (45), 0/39)
Lyon, Centre Léon Bérard, CIC 241, P Biron, T Philip (67 (88), 0/67)
Lyon, Hôpital Edouard Herriot, CIC 671, M Michallet, AThiebaut, F Nicolini (63 (91), 34/29)
Lyon Sud (Pierre Benite), Centre Hospitalier, B Coiffier (125 (125), 0/125)
Lyon, Hôpital Debrousse, C Galambrun, Y Bertrand (19 (20), 19/0)
Marseille, Inst Paoli-Calmettes, CIC 230, D Blaise (245 (362), 24/221)
Marseille, Hôpital d'Enfants de la Timone (onco), CIC 301, C Coze, JL Bernard (11 (13), 0/11)
Meaux, Centre Hospitalier de Meaux, C Soussain (18 (18), 0/18)
Metz, Thionville Hôpital Notre-Dame de Bon-Secours (hem), V Dorvaux, B Christen (23 (27), 0/23)
Montpellier, CHU de Montpellier Hôpital Arnaud de Villeneuve, F Bernard (2 (2), 1/1)
Montpellier, Centre Rég De Lutte contre de Cancer, M Fabbro, J-B Dubois (7 (8), 0/7)
Montpellier, CHR Lapeyronie (hem), CIC 926, JF Rossi (106 (116), 19/87)
Mulhouse, Hôpital du Hasenrain, M Ojeda, Ph Hénon (16 (18), 0/16)
Nantes, Hotel Dieu (hem), CIC 253, JL Harousseau, N Milpied (111 (156), 28/83)

Nice, Hôpital de l'Archet 1, CIC 523, JP Cassuto, N Gratecos (45 (61), 16/29)
Nice, Fondation Lenval (peds), Dr Soler, Dr De Ricaud (2 (2), 0/2)
Nice, Centre Antoine Lacassagne, A Thyss (15 (22), 0/15)
Paris, Hôpital Necker (ads, hem), CIC 160, B Varet, C Bélanger, A Veil (73 (77), 39/34)
Paris, Hôpital Necker des enfants malades, CIC 201, A Fischer (36 (40), 36/0)
Paris, Hôpital St Louis (hem allo, ads, peds), CIC 207+ CIC 748, E Gluckman, H Esperou, A Baruchel, M-F Auclerc (104 (108), 104/0)
Paris, Hôpital St Louis (auto), CIC 805, G Gisselbrecht (57 (57), 0/57)
Paris, Hôpital St Louis (auto-leuk), CIC 960, H Dombret, L Degos, P Rousselot*
Paris, Hôpital St Louis (auto immuno-Haem), J-C Brouet, B Anruf, J-P Fermand (67 (67), 0/67)
Paris, Hôpital St Antoine (hem), CIC 213, C Gorin, L Fouillard (35 (46), 10/25)
Paris, Hôpital D'enfants Armand-Trousseau, CIC 213, G Leverger, A Auvrignon, L Douay (8 (9), 0/8)
Paris, Hôtel Dieu (hem), CIC 222, J-P Marie, B Rio (63 (72), 12/51)
Paris, Hôpital Pitié Salpétière (hem), CIC 262, J-P Vernant, V Leblond, N Dedhin (91 (94), 43/48)
Paris, Institut Curie (ads/onco/peds), CIC 702, J Michon*
Paris, Hôpital Tenon (onco), JP Lotz, CIC 747 (27 (47), 0/27)
Paris, Hôpital Robert Debré, K Yakouben, A Baruchel (18 (21), 15/3)
Paris, Hôpital Européen GP, JM Andrieu, C Le Maignan (20 (20), 0/20)
Paris, Hotel Dieu (onco), Professor Bernadou, L Chauvenet (0 (0), 0/0)
Paris, Hôpital d'Instruction des Armées Percy, Clamart, T de Revel, G Nedellec (18 (32), 2/16)
Paris, Hôpital Cochin, F Dreyfus, M Quarre*
Pessac, Hôpital Haut-Lévèque, CHU Bordeaux, CIC 267, J Reiffers, G Marit, R Tabrizi (106 (148), 32/74)
Poitiers, Hôpital la Miletrie, CIC 264, M Renaud (65 (95), 15/50)
Pontoise, Hospital Renè Dubois (onco), CIC 961, F Moruan (13 (18), 0/13)
Reims, Hopital Robert Debré (hem, onco), CIC 959, B Pignon, C Himberlin (21 (29), 0/21)
Rennes, CHRU, Clinique Médical Infantil, E Le Gall, V Gandemer (9 (10), 5/4)
Rouen, Centre Henri Becquerel, H Tilly, P Lenain (72 (91), 18/54)
Rouen, Hôpital Charles Nicolle, JP Vannier (11 (12), 5/6)
St Cloud, Centre René Huguenin, CIC 551, M Janvier (7 (8), 0/7)
Strasburg, Hôpital de Hautepierre, B Lioure (84 (101), 22/62)
Strasburg, Hospices Civils, Service de Pédiatrie 5, P Lutz (18 (18), 7/11)
Toulouse, Hôpital de Purpan (hem), CIC 624, M Attal, J-C Nogaro (107 (131), 35/72)
Toulouse, Hôpital de Purpan (peds), CIC 624, H Rubie (5 (5), 2/3)
Toulouse, Centre Claudius Régaud, H Roche, C Chevreau (8 (16), 0/8)
Tours, Hôpital Bretonneau (onco), CIC 272, P Colombat (102 (118), 0/102)
Valenciennes, Hosp De Valenciennes, M Simon*
Vandeuvre-les-Nancy, Hôpital d'Enfants, P Bordigoni (34 (49), 24/10)
Vandeuvre-les-Nancy, CHU Nancy-Brabois (hem auto), P Lederlin, F Witz (57 (74), 0/57)
Villejuif, Institut G Roussy (peds), CIC 503, O Hartmann, D Valteau-Couanet (55 (99), 0/55)
Villejuif, Institut G Roussy (ads, hem), CIC 666, J-H Bourhis, C Boccaccio, J-M Vantelon*
Villejuif, Hôpital Paul Brousse, B Delmas-Marsalet (2 (2), 0/2)

Georgia: no report

Germany (107 teams; 3750 (4840), 1406/2344)
Aachen, Universitätsklinikum RWTH (hem, onco), Med Klinik lV, CIC 348, R Osieka, G Gehbauer (13 (16), 0/13)
Augsburg, Zentralklinikum (hem,onco), Med Klinik II, G Schlimok, M Sandherr (26 (31), 4/22)
Bad Saarow, Humaine Klinikum, G Schultze, H Fuss, P Frenzel (17 (17), 0/17)
Berlin, Universitätsklinikum der HU Charité Campus Virchow Klinikum (peds), CIC 336, W Ebell, G Gaedicke, J Kühl (36 (38), 29/7)
Berlin, Universitätsklinikum der HU Charité Campus Virchow Klinikum (ads, hem, onco), CIC 807, R Arnold (78 (94), 45/33)
Berlin, HELIOS Klinikum Berlin, Robert-Rössle Klinik (hem, onco), CIC 518, B Dörken, W-D Ludwig, M Hildebrandt (27 (34), 0/27)
Berlin, Universitäts-Klinik der FU Benjamin Franklin (hem, onco), CIC 590, E Thiel, L Uharek (60 (75), 22/38)
Berlin, Krankenhaus Neukölln (hem, onco), AC Mayr, C Kerschgens (0 (0), 0/0)
Bielefeld, Krankenanstalten Gilead (hem, onco), R Kolloch, U Kruempelmann, J Klempin (3 (4), 0/3)
Bielefeld, Franziska Hospital (hem, onco), HJ Weh, A Zumsprekel, T Nitsch (7 (12), 0/7)
Bochum, Knappschaftskrankenhaus (hem, onco), W Schmiegel, U Graeven (16 (26), 0/16)
Bonn, Rheinische Frierdrich-Wilhelms Universität (ads, hemonco), T Sauerbruch, I Schmidt-Wolf, C Ziske (22 (32), 0/22)
Bonn, Rheinische Frierdrich-Wilhelms Universität (peds, hemonco), U Bode, C Hasan (5 (8), 0/5)
Braunschweig, Städtisches Klinikum (hem, onco), CIC 674, B Wörmann, T Gabrysiak (22 (28), 0/22)
Bremen, Zentralkrankenhaus St Jürgenstrasse, CIC 602, H Rasche, C R Meier (15 (21), 0/15)
Bremen, DIAKO (hem, onco), T Wolff, KH Pflüger (19 (28), 0/19)
Chemnitz, Krankenhaus Küchwald (hem), F Fiedler, G Geissler, A Hänel (60 (69), 0/60)
Cottbus, Carl-Thiem Klinikum, Med Klinik ll (hem), H Steinhauer, N Peter (18 (30), 0/18)
Dessau, Städtisches Klinikum Dessau (hem, onco), M Plauth, A Florschütz (0 (0), 0/0)
Dortmund, St Johannes Hospital (hem, onco), H Plelken, M Nahler (4 (7), 0/4)
Dresden, Universitätsklinikum Carl Gustav Carus (hem, onco), CIC 808, G Ehninger, M Bornhäuser (132 (167), 73/59)
Duisburg, St Johannes Hospital, CIC 519, C Aul, J Anhuf (37 (42), 0/37)
Düsseldorf, Heinrich-Heine Universität; Medizinische Klinik (hem, onco) and St Antonius Hospital, Eschweiler (hem, onco), CIC 390, R Haas, G Kobbe, R Fuchs (92 (113), 38/54)
Düsseldorf, Heinrich-Heine Universität; Zentrum für Kinderheilkunde, CIC 651, U Göbel, D Dilloo (32 (58), 17/15)
Erlangen, Universitäts-Klinik für Kinder und Jugendliche (hemonco), CIC 809, W Rascher, W Holter, D Stachel (13 (13), 7/6)
Erlangen, Universität Erlangen-Nuremberg (hem, onco), Med Klinikum lll, CIC 809, M Gramatzki, J-R Kalden (31 (34), 8/23)
Essen, Universitätsklinikum (ads, peds), CIC 259, UW Schaefer, DW Beelen, W Havers, B Kremens, V Runde, O Basu (168 (182), 146/22)
Essen, Evangelisches Krankenhaus Essen-Werden GmbH (hem, onco), CIC 784, W Heit, M Wattad (39 (40), 0/39)
Essen, Universitätsklinikum (hem), U Dührsen, R Noppeney (18 (24), 0/18)
Essen, West German Cancer Center, S Seeber, P Bojko (35 (83), 0/35)
Frankfurt aM, Universitätklinikum dJW Goethe (hem, onco peds), CIC 138, T Klingebiel, D Schwabe (18 (21), 8/10)
Frankfurt aM, JW Goethe-Universität (ads), CIC 297, D Hoelzer, H Martin (76 (94), 31/45)
Frankfurt, KH Nordwest, A Knuth, E Jäger (1 (1), 0/1)
Frankfurt/Mainz, Städtisches Klinikum (ads), HG Derigs (9 (9), 0/9)
Freiburg i. Br., Universitätsklinik (ads, hem, onco), Med Klinik l, CIC 810, J Finke, R Mertelsmann (115 (138), 56/59)
Freiburg i. Br., UniversitätsKinderklinik (hem, onco), CIC 810, C Niemeyer, U Kontny, U Duffner (31 (33), 22/9)
Giesen, UniversitätsKinderklinik (hem, onco), CIC 326, A Reiter, W Wössmann (16 (23), 9/7)
Göttingen, Georg-August Universität (hem, onco), CIC 552, B Glass, L Trümper (76 (85), 33/43)
Greifswald, Ernst-Moritz-Arndt Universität (ads+peds), CIC 530, G Dölken, W Krüger (28 (31), 15/13)
Gütersloh, Städtkrankenhaus (hem, onco), R Depenbusch, C Gropp (3 (4), 0/3)
Hagen, Kath Krankenkaus (hem, onco), CIC 536, H Eimermacher, W Rethwisch (13 (23), 0/13)
Halle, Martin Luther Universität (hem, onco, ads), CIC 338, H-J Schmoll, H Wolf (16 (26), 0/16)
Halle, Martin Luther Universität (hem, onco, peds), CIC 654, S Burdach, A Wawer (3 (5), 1/2)
Hamburg, KH St George (hem, onco), CIC 153, P Dreger, N Schmitz (35 (46), 2/33)
Hamburg, Allgemeines Krankenhaus Altona (hem, onco), CIC 366, D, Braumann, H Salwender (35 (55), 0/35)
Hamburg, Eppendorf-Krankenhaus (hem, onco, ads, peds) CIC 614, AR Zander (118 (122), 101/17)
Hamburg, Eppendorf-Krankenhaus (hem, onco, ads), Med Klin ll, CIC 673, D Hossfeld (27 (33), 0/27)

Hameln, Kreiskrankenhaus Hameln (hem, onco), H Schmidt (7 (8), 0/7)
Hamm, St Marien Hospital (hem, onco), H Dürk (9 (9), 0/9)
Hamm, Evangelisches Krankenhaus (hem, onco), CIC 509, L Balleisen (0 (0), 0/0)
Hannover, Medizinische Hochschule (hem, onco, ads), CIC 295, A Ganser, B Hertenstein (89 (123), 46/43)
Hannover, Medizinische Hochschule (hem, onco, peds), CIC 295, K Welte, K Sykora (33 (37), 26/7)
Hannover, KH Siloah, CIC 342, H Kirchner, M Sosada (10 (10), 0/10)
Heidelberg, Ruprecht-Karls Universitäts-Poliklinik (hem, onco), CIC 524, AD Ho, H Schäfer (180 (286), 23/157)
Homburg/Saar, Universität des Saarlandes (hem, onco), CIC 785, J Schubert, M Pfreundschuh (56 (82), 19/37)
Idar-Oberstein, Klinik für Hämato-/Onkologie, CIC 592, AA Fauser, N Basara (35 (46), 20/15)
Jena, Klinik der FSU (hem, onco), Innere Medizin ll, CIC 533, HG Sayer, K Hoeffken (41 (61), 21/20)
Jena, Klinikum der FSU (hem, onco), Universitäts-Kinderklinik, CIC 750, F Zintl, D Fuchs (23 (25), 16/7)
Kaiserslautern, Westpfalzklinikum (hem), CIC 357, F-G Hagmann, H Link (5 (6), 1/4)
Karlsruhe, Städtisches Klinikum (hem, onco), CIC 290, J Fischer, T Kubin (14 (23), 0/14)
Kassel, Städtische Kliniken (hem, onco), E Steinhauer, M Wolf (2 (2), 0/2)
Kiel, Christian-Albrechts-Universität (hem, onco), CIC 256, M Kneba (66 (85), 22/44)
Köln, Universitäts-Klinik (ads, peds), CIC 534, V Diehl, Ch Scheid, F Berthold, T Simon (68 (79), 13/55)
Krefeld, Klinikum Krefeld, Med Klinik lll, S Helmer, T Frieling (9 (14), 0/9)
Leipzig, Universitäts-Klinik (hem, onco), CIC 389, D Niederwieser, R Krahl, W Pönisch (120 (139), 63/48)
Lemgo, Klinikum Lippe, HP Lohrmann (2 (2), 0/2)
Lübeck, MedUniversität (ads), CIC 367:1, J Fem, S Peters (20 (33), 0/20)
Lübeck, MedUniversität (peds), CIC 367:2, P Bucsky, Ch Schultz (1 (2), 0/1)
Lübeck, Städtisches KH Sud (hem, onco), Dr Heer-Sonderhoff, S Fetscher (17 (17), 0/17)
Magdeburg, Otto-von-Guericke Universität (hem, onco), CIC 359, A Franke, M Koenigsmann (18 (25), 0/18)
Magdeburg, Krankenhaus Altstadt, R Nowak, H Kroning (0 (0), 0/0)
Mainz, Johannes-Gutenberg-University (hem), Med Klin lll, CIC 786, C Huber, K Kolbe (72 (91), 25/47)
Mannheim, III Med Klinik, R Hehlmann, J Hastka (14 (16), 0/14)
Marburg, Med Universitätsklinik der Philipps Universität (hem, onco), CIC 645, A Neubauer, J Beyer (41 (60), 15/26)
Minden/Westfallen, Med Klinik (hem, onco), H Bodenstein, HJ Tischler (14 (15), 0/14)
Mönchengladbach, KH Maria Hilf ll, D Kohl, H-E Reis (12 (19), 0/12)
Munich, Klinikum Grosshadern der LMU (ads, hem, onco) CIC 513, H-J Kolb, W Hiddemann (117 (154), 79/38)
Munich, Klinikum Innenstadt der LMU (peds, hem, onco), CIC 513, C Bender-Götze (18 (20), 13/5)
Munich, SKH München-Harlaching (hem, onco), CIC 664, R Hartenstein, M Hentrich (14 (21), 0/14)
Munich, Städt Krankenhaus Schwabing (hem, onco, peds), P Emmerich, L Stengel-Rutkowski (5 (5), 3/2)
Munich, Klinikum Innenstadt der LMU, C Straka, D Schlöndorff (27 (40), 0/27)
Munich, SKH München-Schwabing (hem, onco), Ch Nerl, N Fischer, C Waterhaus (27 (29), 0/27)
Munich, Klinikum rechts der Isar (hem, onco), CIC 558, C Peschel, C v Schilling (46 (63), 4/42)
Münster, Westfälische Wilhelms-Universitäts Kinderklinik (hem, onco), CIC 505, H Jürgens, J Vormoor, T Huf (25 (30), 20/5)
Münster, Westfälische Wilhelms-Universitäts Klinik (hem, onco), Innere Med CIC 680, W Berdel, J Kienast (81 (98), 28/53)
Neuss, Lukaskrankenhaus (hem, onco), P Czygan, J Streuss (0 (0), 0/0)
Nürnberg, Städt Klinikum (hem, onco), CIC 625, H Wandt, W Gallmeier, K Schäfer (68 (79), 23/45)
Oldenburg, Klinikum Oldenburg (hem, onco), CIC 749, B Metzner, H Illiger (53 (89), 0/53)
Potsdam, Klinikum Ernst von Bergmann (hem, onco), A Haas, R Pasold (15 (23), 0/15)
Regensburg, Universitäts Klinikum (hem, onco), CIC 787, E Holler, R Andreesen, A Reichle (90 (125), 40/50)
Rostock, Universitäts Klinikum (hem, onco), CIC 585, M Freund, J Casper (52 (81), 17/35)
Siegen, St Marien Krankenhaus (hem, onco), CIC 135, T Gaska, W Gassmann (6 (10), 0/6)
Stuttgart, Robert-Bosch-Krankenhaus (hem, onco), CIC 145, S Martin, W Aulitzky (33 (38), 3/30)
Stuttgart, Olgahospital (hem, onco), Pädiatrisches Zentrum, CIC 701, J Treuner, E Koscielniak (4 (4), 0/4)
Stuttgart, Bürgerhospital, W Grimminger, H Mergenthaler (15 (24), 0/15)
Stuttgart, Diakonissen Krankenhaus, E Heidemann, J Kaesberger (3 (5), 0/3)
Stuttgart, Katharinenhospital (onco), J Schleicher, H-G Mergenthaler (14 (20), 0/14)
Tübingen, Medizinische Universitäts-Klinik (hem, onco), CIC 223, L Kanz, H Einsele, C Faul (98 (134), 33/65)
Tübingen, Medizinische Universitäts-Klinik (hem, onco), Abteilung Pädiatrie, CIC 535, J Greil, D Niethammer (29 (33), 24/25)
Ulm, Medizinische Universitäts-Klinik (hem, onco), CIC 204, H Döhner, D Bunjes (106 (135), 46/60)
Ulm, Kinderklinik der Universität, CIC 204, W Friedrich, K Debatin, A Schultz (31 (34), 30/1)
Villingen, Klinikum Villingen (6 (7), 0/6)
Wiesbaden, Deutsche Klinik für Diagnostik, CIC 311, R Schwerdtfeger, M Schleining, H Baurmann (76 (80), 67/9)
Wiesbaden, Dr Horst-Schmidt Klinikum (hem, onco), CIC 586, N Frickhofen, B Jung (8 (17), 0/8)
Wuppertal, Klinikum Wuppertal GmbH (hem, onco), A Raghavachar (0 (0), 0/0)
Würzburg, Universitätsklinikum Würzburg (hem, onco, ads), CIC 712, K Wilms, F Weissinger (34 (44), 0/34)
Würzburg, Universitätsklinikum Würzburg (peds), P Schlegel (6 (8), 0/6)

Greece (11 teams; 197 (215), 76/121)
Alexandroupolis, Thrace University Medical School (Haem), CIC 681, G Bourikas, D Pantelidou (6 (6), 0/6)
Athens, Laikon General Hospital, CIC 328, Y Rombos, D Boutsis, V Kalotychou (8 (9), 0/8)
Athens, Medical Center (hem), CIC 603, A Pigadito (2 (2), 0/2)
Athens, University of Athens, CIC 604, I Dervenoulas (3 (3), 0/3)
Athens, Evanghelismos Hospital (hem), CIC 622, D Karakassis, A Skandalis, N Harhalakis, E Nikiforakis (41 (47), 27/14)
Athens, Diagnosis & Therapy Centre "Hygeia" (hem), Maroussi, CIC 643, G Karianakis (9 (9), 0/9)
Athens, Hellenic Cancer Institute St Savas (onco), CIC 751, A Efremedis, M Stamatellou, K Papanastassiou, M Pouli (42 (47), 7/35)
Athens, "Aghia Sophia" Children's Hospital, CIC 752, S Graphakos (26 (26), 17/19)
Crete, University Hospital of Heraklion (peds, hem-onco), CIC 352, M Kalmanti (0 (0), 0/0)
Patras, University Medical School (hem), CIC 281, NC Zoumbos, M Tiniakou (8 (10), 1/7)
Thessaloniki, The George Papanicolaou General Hospital (hem), CIC 561, AS Fassas (52 (56), 24/28)

Hungary (4 teams; 171 (180), 38/133)
Budapest, National Medical Centre (hem), CIC 504, A Poros, A Barta, E Torbagyi (38 (41), 10/28)
Budapest, Szent Laszlo Hospital, CIC 739, T Masszi, P Reményl, G Kriván (85 (91), 21/64)
Miskolc, Postgraduate Medical School (peds), CIC 599, N Kalman, G Marton (18 (18), 7/11)
Pécs, University of Pécs, Internal Medizine, CIC 682, H Losonczy, M Dávid, Á Szomor (30 (30), 0/30)

Iceland (1 team; 0 (0), 0/0)
Reykjavik, National University Hospital (hem), CIC 605, S Reykdal (0 (0), 0/0)

Iran (2 teams; 214 (216), 154/60)
Shiraz, Nemazee Hospital (hem, onco), CIC 188, M Ramzi (27 (27), 6/1)
Teheran, Shariati Hospital (hem, onco), CIC 633, A Ghavamzadeh (187 (189), 128/59)

Ireland (6 teams; 127 (138), 46/81)
Cork, University Hospital, P Cotter (4 (4), 0/4)
Dublin, St James's Hospital (hem), CIC 257, SR McCann (88 (97), 37/51)
Dublin, St Vincent's Hospital (hem, onco), CIC 541, J Crown, K Murphy (8 (8), 0/8)
Dublin, Our Lady's Hospital of Sick Children, Crumlin, CIC 774, A O'Meara (17 (19), 9/8)
Dublin, Mater Hospital (hem), B Otridge (0 (0), 0/0)
Galway, University College Hospital, M Murray (10 (10), 0/10)

Israel (6 teams; 434 (529), 208/226)
Haifa, Rambam Medical Center (hem, ads, peds), CIC 345, J Rowe (130 (145), 52/78)
Jerusalem, Hadassah University Hospital (ads, peds), CIC 258, R Or, S Slavin (113 (140), 68/45)
Petach-Tikva, Children's Medical Center, CIC 755, J Stein (39 (41), 24/15)
Revohot, Kaplan Hospital (hem), CIC 327, A Berribi (12 (13), 0/12)
Tel Aviv, Sourasky Medical Center, CIC 161, E Naparstek (22 (26), 4/18)
Tel Hashomer, Chaim Sheba Medical Center (hem ads, peds) CIC 754 + CIC 572, A Nagler, A Shimoni, A Toren, H Golan, B Bielorai (118 (164), 60/58)

Italy (95 teams; 3326 (4295), 1002/2324)
Alessandria, SS Antonio e Biagio e C Arrigo (hem), CIC 825, A Levis, A Allione, M Pini, F Salvi (36 (45), 80/28)
Ancona, Nuovo Ospedale Torrette (hem), CIC 788, P Leoni, A Olivieri (37 (51), 11/26)
Avellino, AOS Giovanni Di Guglieimo (hem), CIC 789, E Volpe, N Cantore (34 (36), 5/29)
Avezzano, Ospedale Civile di Avezzano, F Recchia (4 (5), 0/4)
Aviano, CRO Aviano (onco), CIC 162, M Michieli, M Rupolo, M Mazzucato, F Lollo 29 (35), 0/29)
Bari, Universita degli Studi di Bari (hem), CIC 649, V Pavone, V Liso (56 (73), 0/56)
Bergamo, Ospedale Riuniti, CIC 658, T Barbui, A Rambaldi (91 (127), 24/67)
Bologna, St Orsola-Malpighi (hem, onco), CIC 240, G Bandini, F Bonifazi, M Baccarani (131 (163), 34/97)
Bologna, St Orsola-Malpighi, Oncologia Medica, CIC 657, A Martoni, C Zamagni (5 (7), 0/5)
Bologna, Poli S Orsola, Clinica pediatrica III, CIC 790, A Pession (29 (36), 12/17)
Bolzano, Ospedale S Maurizio (hem), CIC 299, M Casini, P Fabris, P Coser (44 (82), 5/39)
Brescia, Ospedali Civili, CIC 288, G Rossi, C Almici (56 (73), 0/56)
Brescia, Universitá degli Studi di Brescia (peds), CIC 741, F Porta, A Ugazio (23 (24), 19/4)
Brindisi, Ospedaliera 'A Di Summa', Perrino Hospital (hem), CIC 920, G Quarta, S Pinna (10 (10), 0/10)
Cagliari, Ospedale A Businco (hem), CIC 791, P Dessalvi (41 (55), 12/29)
Cagliari, BMT Center CIC 811, G La Nasa, L Contu (23 (26), 12/11)
Cagliari, Ospedale per le Microcitemie (peds), CIC 812, F Argiolu, A Cao (10 (12), 10/0)
Catania, Ospedale Ferrarotto (hem), CIC 792, R Giustolisi, G Milone (54 (57), 19/35)
Cremona, Ospedale Maggiore (hem), Medicina II, CIC 226, S Morandi, P Spedini, M Tajana, C Fiamenghi (10 (12), 0/10)
Cuneo, Hospital S Croce E Carle (hem), CIC 606, A Gallamini, M Grasso (16 (22), 2/14)
Ferrara, St Anna Hospital (hem), CIC 330, G Castoldi, F Lanza, S Moretti, GM Rigolin, R Spanedda (19 (20), 0/19)
Firenze, Ospedale di Careggi (hem), CIC 304, A Bosi, S Guidi (73 (80), 23/50)
Firenze, Azienda Ospedale, 'AMeyer', CIC 600, L Faulkner (17 (25), 3/14)
Forli, Morgagni-Pierantoni Hospital (onco), CIC 298, GL Frassineti, D Amadori (9 (19), 0/9)
Genova, Università, CIC 139, F Patrone, A Ballestrero (32 (38), 0/32)
Genova, Ospedale S Martino (hem), CIC 217, A Bacigalupo, G Santini (82 (87), 80/2)
Genova, Istituto Giannina Gaslini (hem, onco), CIC 274, G Dini (54 (73), 17/37)
Latina, Ospedale S Maria Goretti, A De Blasio, E Zappone (14 (19), 0/14)
Messina, Policlinico Universitario (onco), CIC 669, V Pitini (9 (11), 0/9)
Milano, Ospedale di Niguarda (onco ST), CIC 184, S Siena, P Pedrazzoli, R Schiavo (46 (57), 7/39)
Milano, Ospedale Maggiore di Milano, CIC 265, G Lambertenghi Deliliers (34 (41), 24/10)
Milano, Ospedale Fatebenefratelli e Oftalmico (onco), CIC 269, A Scanni, C Bianchi, D Pedretti (1 (1), 0/1)
Milano, Ospedale di Niguarda (hem), CIC 294, P Marenco, R Cairoli (65 (76), 17/48)
Milano, Istituto Europeo di Oncologia, CIC 331, G Martinelli (59 (78), 10/49)
Milano, 1st Clinico Humanitas (hem-onco), CIC 354, A Santoro, L Castagna (54 (85), 6/48)
Milano, Istituto Nazionale Tumori (ads), CIC 616, A Gianni, P Corradini (71 (141), 10/61)
Milano, Ist Nazionale Tumori di Milano (onco, peds), CIC 616, R Luksch (26 (45), 0/26)
Milano, S Carlo Borromeo Hospital (onco), CIC 683, L Tedeschi (4 (4), 0/4)
Milano, Istituto Scientifico HS Raffaele, CIC 813, M Bregni (63 (81), 28/35)
Modena, University of Modena (hem, onco), CIC 543, F Narni, A Donelli, R Sabbatini (31 (57), 4/27)
Monza, Ospedale S Gerardo (peds), CIC 279, C Uderzo (25 (30), 16/9)
Monza, Ospedale S Gerardo de' Tintori, CIC 544, P Pioltelli, E Pogliani (44 (58), 8/36)
Napoli, Div Di Oncologia, CIC 313, C Battista, G Pacilio, B Chiurazzi, G Iodice (9 (14), 0/9)
Napoli, Hospital 'Pausilipon' (hem peds), V Poggi, M Ripaldi (15 (16), 9/6)
Napoli, Cardarelli Hospital (hem), CIC 607, F Ferrara (53 (62), 2/51)
Napoli, Cardarelli Hospital (hem), CIC 837, V Mettivier (17 (21), 0/17)
Napoli, Università Federico ll (hem), CIC 766, B Rotoli, C Selleri, G De Rosa (37 (41), 14/23)
Noale, Civic Hospital (onco), CIC 563, O Vinante, G Azzarello (11 (14), 9/2)
Nuoro, Ospedale San Francesco (hem), CIC 793, A Gabbas, A Palmas (13 (17), 0/13)
Orbassano, Ospedale San Luigi Orbassano, CIC 378, G Saglio, A Guerrasio (24 (44), 1/23)
Padova, Centro Leucemie Infantili, CIC 285, C Messina, S Cesaro, L Zanesco, S Varotto (20 (28), 15/5)
Padova, Centro Oncologia Regionale, CIC 319, S Aversa, S Monfardini (15 (17), 4/11)
Palermo, Ospedale V Cervello (hem), CIC 392, R Scimè, A Cavallaro (47 (63), 10/37)
Palermo, Ospedale 'La Maddalena' (hem, onco), CIC 692, M Musso, F Porretto, A Crescinanno (41 (67), 8/33)
Palermo, Uni degli studi di Palermo (hem), CIC 814, G Mariani (18 (20), 0/18)
Parma, Cattedra di Ematologia, Univ of Parma, CIC 245, V Rizzoli (12 (18), 0/12)
Pavia, Policlinico S Matteo (hem), CIC 286, EP Alessandrino (64 (69), 21/43)
Pavia, Policlinico St Matteo (hem, onco, peds), CIC 557, F Locatelli (77 (94), 60/17)
Pavia, Policlinico St Matteo (onco), CIC 562, M Danova (18 (18), 0/18)
Pavia, Fondazione S Maugeri (onco), CIC 771, A Zambelli, G Robustelli della Cuna (7 (13), 1/6)
Perugia, Policlinico Monteluce (onco), CIC 573, AM Liberati, F Grignani (23 (26), 0/23)
Perugia, Policlinico Monteluce (hem), Università, CIC 794, MF Martelli, F Aversa, A Tabilio (119 (125), 52/67)
Perugia, Silvestrini Hospital, A Amici (0 (0), 0/0)
Pesaro, Ospedale San Salvatore, CIC 529, G Visani, G Lucarelli (64 (66), 44/20)
Pescara, Ospedale Civile (hem), CIC 248, P di Bartolomeo (39 (43), 27/12)
Piacenza, Ospedale Civile (hem, onco), CIC 163, L Cavanna (12 (18), 2/10)
Pisa, St Chirara Hospital (ads, onco) CIC 320, C Bengala (9 (9), 1/8)
Pisa, University of Pisa (Ads hem, peds hem + onco), CIC 795, P Macchia, M Petrini (57 (84), 13/44)
Ravenna, Ospedale Civile (hem, onco), CIC 306, G Rosti (25 (41), 0/25)
Reggio di Calabria, Azienda Ospedale "Riuniti e Morelli", CIC 587, P Iacopino (57 (74), 12/45)
Reggio Emilia, Arcispedale S Maria Nuova (hem), CIC 660, L Gugliotta (17 (22), 7/10)
Rimini, Ospedale Infermi Rimini (hemonco), P Fattori (12 (15), 0/12)
Rionero in Vulture, Ospedale Oncologico Regionale, CIC 185, N Di Renzo (13 (15), 0/13)
Roma, Regina Elena Cancer Institue (hem, onco), CIC108, M Petti (2 (3), 0/2)
Roma, Università "La Sapienza", CIC 232, W Arcese, F Mandelli, G Meloni (100 (109), 35/65)

Roma, Ospedale S Camillo (hem), CIC 287, I Majolino, A Locasciulli (38 (47), 20/18)
Roma, Università Cattolica (hem), CIC 307, S Cuore, S Sica, G Leone (21 (21), 9/12)
Roma, Ospedale Bambino Gesu (hem), CIC 315, G De Rossi (4 (4), 2/2)
Roma, Università S Eugenio (hem), CIC 756, W Arcese, P Fabritiis (51 (55), 18/33)
Roma, Ospedale Bambino Gesu (onco), CIC 796, A Donfrancesco (19 (23), 0/19)
San Giovanni Rotondo, Hospital Casa Sollievo Sofferenza (onco), CIC 314, M Aieta*
San Giovanni Rotondo, Hospital Casa Sollievo Sofferenza (peds), CIC 350, P Paolucci, M Pastore (4 (8), 0/4)
San Giovanni Rotondo, Hospital Casa Sollievo Sofferenza (hem), CIC 526, M Corsetti, M Greco (51 (68), 19/32)
Siena, Ospedale Sclavo (hem), CIC 321, F Lauria (41 (46), 12/29)
Taranto, Ospedale Nord (hem), CIC 332, P Mazza, G Palazzo, B Amurri (60 (62), 17/43)
Torino, Azienda Ospedaliera S Giovanni, CIC 231, M Falda, F Locatelli (63 (91), 28/35)
Torino, Ospedale Regina Margherita (peds), CIC 305, E Madon, F Fagioli, E Vassallo (45 (63), 18/27)
Torino, Ospedale Mauriziano Umberto 1, IRCC, CIC 377, M Aglietta, A Capaldi, F Carnevale (22 (25), 10/12)
Torino, Ospedale S Giovanni (hem), CIC 696, M Boccadoro, M Massaia, C Tarella, B Benedetto, D Caracciolo, A Pileri (60 (130), 14/46)
Trieste, Istituto per I'Infanzia, Clinical Pediatrica, CIC 525, M Andolina (10 (10), 7/3)
Udine, Policlinico Universitario (hem), CIC 705, R Fanin (99 (131), 32/67)
Venezia, Ospedale Civile Riuniti di Venezia (hem), CIC 502, T Chisesi, M Vespignani, M Chinello (18 (28), 1/17)
Verbania Pallanza, Ospedale di Verbania, M Bersi*
Verona, Policlinico di Borgo Roma (hem, onco), CIC 623 + CIC 514, G Perona, F Benedetti, G Cetto (57 (60), 14/43)
Vicenza, Ospedale S Bortolo (hem), CIC 797, R Raimondi, F Rodeghiero (45 (60), 8/37)

Latvia: no report
Liechtenstein: no report

Lithuania: (2 teams; 49 (54), 20/29)
Vilnuis, University Hospital Santariskiu Klinikos (hem), I Trociukas (42 (47), 17/25)
Vilnuis, University Children's Hospital (hem, onco), CIC 508, J Rascon (7 (7), 3/4)

Luxemburg (1 team*)
Esch-Alrette, Hopital de la Ville Esch/Alzette, CIC 545, F Le Moine*

Macedonia: (1 team; 22 (22), 3/19)
Skopje, Medical Faculty (hem), CIC 381, B Georgievski (22 (22), 3/19)

Malta: no report
Moldova: no report
Monaco: no report

Netherlands (13 teams; 688 (791), 269/419)
Amsterdam, Academic Medical Center (ads, peds), CIC 247, J van der Lelie, H van den Berg (peds) (45 (49), 7/38)
Amsterdam, Free University Hospital (hem), CIC 588, GJ Ossenkoppele (68 (96), 12/56)
Amsterdam, The Netherlands Cancer Institute, S Rodenhuis J Baars (17 (32), 0/17)
Enschede, The Medisch Spectrum Twente, CIC 360, Dr Schaafsma (20 (20), 0/20)
Groningen, University Hospital (hem), CIC 546, G van Imhoff, E Vellenga (41 (45), 10/31)
The Hague, Leyenburg Hospital, CIC 547, PW Wijermans (16 (22), 0/16)
Leiden, University Medical Centre (ads, peds), CIC 203, R Willemze, M Egeler (86 (96), 55/31)
Maastricht, University Hospital (hem, onco), CIC 565, HC Schouten, J Wagstaff (54 (54), 22/32)
Nieuwegein, St Antonius Hospital, CIC 200, D Biesma, G Veth, O de Weerdt (12 (14), 0/12)
Nijmegen, University Hospital (ads, peds, onco), CIC 237, A Schattenberg, L Beex, P Hoogerbrugge (102 (102), 49/53)
Rotterdam, Dr Daniel den Hoed Cancer Center, CIC 246, JJ Cornelissen (109 (118), 43/66)
Utrecht, University Hospital (hem, ads, peds), CIC 239, LF Verdonck, NM Wulffraat (111 (136), 71/40)
Zwolle, Isala Kliniecken/Sophia Ziekenhuis, CIC 548, M von Marwijk Kooy (7 (7), 0/7)

Norway (5 teams; 126 (129), 37/89)
Bergen, Haukelands Sjukhus, P Ernst (12 (13), 0/12)
Oslo, Rikshospitalet, CIC 235, D Albrechtsen, L Brinch (56 (58), 37/19)
Oslo, The Norwegian Radium Hospital (onco), CIC 782, S Kvaloy (29 (29), 0/29)
Oslo, Ullevals Sjukhus (haem), F Wisslöf, J-M Tangen (11 (11), 0/11)
Trondheim, St Olavs Hospital, J Hammerstrom, A Waage (18 (18), 0/18)

Poland (17 teams; 706 (802), 268/438)
Bydgoszcz, Medical University (peds, hem, onco), CIC 764, M Wysocki, J Stycznski (1 (1), 1/0)
Gdansk, Medical University (hem), CIC 799, A Hellmann (57 (58), 27/30)
Katowice, Silesian Medical Academy (hem), CIC 677, J Holowiecki (142 (168), 62/80)
Krakow, Jagiellonian University (hem), CIC 553, A Skotnicki (51 (55), 18/33)
Krakow, Polish-American Children's Hospital, JUMC, CIC 507, M Ratajczak (6 (6), 0/6)
Lodz, Medical University of Lodz (hem), CIC 171, T Robak (17 (17), 0/17)
Lublin, Children's University Hospital (hem, onco), CIC 678, J Kowalczyk (27 (28), 15/12)
Lublin, University Medical School (hem, onco), CIC 695, A Dmoszynska, M Wach, A Walter-Croneck, W Legiec (31 (40), 0/31)
Poznan, Institute of Pediatrics, CIC 641, J Wachowiak (14 (19), 12/2)
Poznan, K Marcinkowski University (hem), CIC 730, M Komarnicki (64 (66), 23/41)
Warsaw, Institute of Haematology and Blood Transfusion, CIC 693, B Marianska, L Konopka, B Nasilowska (18 (18), 5/13)
Warsaw, Maria Sklodowska-Curie, Centre of Oncology, CIC 800, J Walewski (47 (54), 2/45)
Warsaw, Central Hospital Military Medical Academy (hem, onco), CIC 816, P Rzepecki, K Sulek, C Szczylik (36 (41), 7/29)
Warsaw, Central Clinical Hospital (hem, onco), CIC 954, W Wiktor-Jedrzejczak, A Deptala, M Rokicka (49 (77), 18/31)
Wroclaw, K Diuske Hospital, CIC 538, A Lange (62 (66), 31/31)
Wroclaw, Medical Academy (hem), CIC 699, K Kuliczkowski (16 (16), 2/14)
Wroclaw, University of Medicine (peds, hem, onco), CIC 817, A Chybicka (68 (72), 45/23)

Portugal (6 teams; 243 (273), 87/146)
Coimbra, University Hospital, CIC 164, N Costa (13 (13), 0/13)
Lisbon, Instituto Portugues de Oncologia, CIC 300, M Abecasis, F Leal Costa (52 (69), 20/32)
Lisbon, Hospital de Santa Maria, CIC 636, J Alves do Carmo, F de Lacerda (41 (44), 32/9)
Lisbon, Hospital de St Antonio dos Capuchos, CIC 826, A Botelho de Sousa (33 (33), 0/33)
Porto, Instituto Portugues de Oncologia, CIC 291, P Pimentel, F Campilho (79 (88), 35/44)
Porto, Hospital S Joao (hem onco), CIC 329 (merged with CIC 572, F Principe, JE Guimaraes (25 (26), 0/25)

Romania: (3 teams; 13 (13), 2/11)
Bucharest, Fundeni University Hospital (hem), CIC 296, AD Moicean, D Colita, C Arion (3 (3), 1/2)
Targu-Mures, Sectia Clinica de Hematologie, CIC 178, I Benedek (8 (8), 0/8)
Timisoara, University of Medicine (lll peds Hem/Onco), CIC 174, M Serban (2 (2), 1/1)

Russia (13 teams; 194 (212), 61/133)
Ekaterinburg, City Hospital No 7, LB Filatov (7 (7), 1/6)
Ekaterinburg, Regional Hospital No 1, TS Konstantinova, VA Shalaev (10 (11), 2/8)

Moscow, Russian Children's Hospital (hem), CIC 694, A Maschan, E Skorobogato, E Pachanov (38 (42), 27/11)
Moscow, Cancer Research Center, CIC 757, V Ptuschkin (25 (26), 0/25)
Moscow, Institute of Biophysics, AE Baranov (6 (7), 0/6)
Moscow, Cancer Research Center peds Hem/onco, G Mentrevich (24 (24), 2/22)
Moscow, Research Hematology Center of RAS, VG Savtchenko (21 (23), 8/13)
Novosibirsk, Insitute of Clinical Immunology, CIC 376, I Lisukov (12 (12), 1/11)
Samara, Regional Hospital, VA Rossiev (14 (14), 2/12)
St Petersburg, Clinical Center for Advanced Medical Tech, CIC 370, E Podoltseva, V Soldatenkov, O Ryasnyanskaya (4 (9), 1/3)
St Petersburg, Military Medical Academy (hem), CIC 520, A Novik*
St Petersburg, Research Institute of Hematology, KM Abdulkadirov (6 (7), 2/4)
St Petersburg, State Pavlov Medical University (hem), CIC 725, BV Afanassiev, L Zubarovskaya (27 (30), 15/12)

San Marino: no report

Saudi Arabia (2 teams; 170 (179), 128/42)
Riyadh, King Faisal Specialist Hospital and Research centre (onco, ads hem), CIC 3971, M Al Jurf (99 (104), 59/40)
Riyadh, King Faisal Specialist Hospital and Research centre (peds hem, onco), CIC 3972, M Ayas (71 (75), 69/2)

Slovakia (4 teams; 118 (125), 24/94)
Bansra Bystrica, Roosevelt Hospital (hem), CIC 333, I Markuljak, E Kralikova (13 (16), 0/13)
Bratislava, National Cancer Institute, CIC 560, J Lakota (70 (73), 8/62)
Bratislava, University Hospital (hem), CIC 610, M Mistrik (25 (26), 11/14)
Bratislava, University Hospital, 2nd Children's Clinic, CIC 684, J Lukac (10 (10), 5/5)

Slovenia (1 team; 35 (43), 9/26)
Ljubljana, University Medical Centre (hem), CIC 640, J Pretnar (35 (43), 9/26)

Spain (73 teams; 1677 (1868), 455/1222)
Alicante, Hospital General, C Rivas-Gonzales*
Barcelona, Hospital Clinic (hem, onco), CIC 214, E Montserrat, E Carreras (65 (73), 25/40)
Barcelona, Santa Creu I Sant Pau (adults), CIC 260, J Sierra, S Brunet (88 (112), 23/65)
Barcelona, Santa Creu I San Pau (peds), CIC 260, I Badell Serra, J Cubells-Riero (6 (6), 2/4)
Barcelona, Santa Creu I Sant Pau (onco), CIC 260, Dr JJ Lopez, C Solà*
Barcelona, Hospital M Infantil, CIC 527, J Ortega (38 (41), 19/19)
Barcelona, Hospital Mutua de Terrasa (hem-onco), T Marti (4 (4), 0/4)
Barcelona, Hospital General "Vall d'Hebron", CIC 527, A Julia Font, J Zuazu (24 (27), 6/18)
Barcelona, Hospital Universitario Germans Trias i Pujol, CIC 613, J Ribera (29 (32), 8/21)
Barcelona, Hospital Sant Joan de Deu, CIC 668, J Estella Aguado (12 (18), 0/12)
Barcelona, Hospital Duran i Reynals (Hem), Institut Catala d'Oncologia, CIC 759, C Ferra, J Berlanga, A Fernàndez (31 (33), 13/18)
Barcelona, Inst Hemat Torre Vilana, Cen Medico Teknon, CIC 777, P Vivancos (inactive)
Barcelona, Instituto de Oncologia Corachan, D Alfonso-Modolell (0 (0), 0/0)
Caceres, Hospital San Pedro de Alcantara, M Luz Amigo Lozano (16 (19), 0/16)
Cadiz, Hospital del SAS de Jérez (hem), CIC 612, A Leon (29 (35), 9/20)
Cadiz, Hospital Universitario 'Puerta del Mar' (hem), CIC 679, J Gil (15 (15), 0/15)
Canary Isles, Las Palmas, Hospital Insular (hem), CIC 335, J Gonzalez-San Miguel (10 (12), 0/12)
Canary Isles, Las Palmas, Hospital Materno-Infantil (haem, onco), J Lodos Rojas, A Molinés (2 (2), 0/2)
Canary Isles, Las Palmas, Hospital Universitario de Gran Canaria 'Dr Negrin', T Molero, R Mataix, C Campo, S Jiménez (15 (18), 9/6)
Canary Isles, Teneriffe, Hospital Universitario de Canarias, L Hernandez Nieto, MT Hernandez Garcia (15 (15), 0/15)
Canary Isles, Teneriffe, University Hospital, P Rios Rull (11 (11), 0/11)
Castellon de La Plana, Hospital General de Castellon (haem), R Garcia-Boyero (8 (8), 0/8)
Cordoba, Hospital Reina Sofia (hem), CIC 238, A Torres Gomez (38 (40), 25/13)
Cordoba, Hospital de la Cruz Roja de Cordoba (haem), J-M Garcia-Castellano*
Cruces-Barakaldo, Hospital de Cruces (hem), CIC 393, I Zuazua-Verde, F Floristan (35 (36), 0/35)
Galdakao, Hospital de Galdakao, Hem, CIC 975, J Ojanguren, K Atutxa (9 (11), 0/9)
Granada, Hospital Virgen de la Nieves (hem), CIC 559, JM de Pablos Gallego (32 (36), 10/22)
Jaen, Hospital Cuidad de Jaen (haem), A Alcalam*
La Coruna, Complexo Hospitalario Juan Canalejo, CIC 361, FJ Batlle, C Ramirez, P Torres, R Varela (39 (43), 5/34)
Lérida, Hospital Arnan de Villanova, J Macia (11 (11), 0/11)
Lugo, Hospital Xeral-Calde, M Gonzales-Lopez (8 (8), 0/8)
Madrid, Hospital de la Princesa (hem), CIC 236, JM Fernández Rañada, A Figuera, A Alegre (60 (60), 32/28)
Madrid, Hospital Doce de Octubre, CIC 382, JJ Lahuerta (hem), H Cortés Funes (onco), J Lopez Perez (peds) (71 (75), 4/67)
Madrid, Hospital Ramon y Cajal (ads), CIC 615, J Odriozola, J Pérez de Oteyza, J Lopez, J Garcia Larana (42 (42), 19/23)
Madrid, Hospital Ramon y Cajal (peds), CIC 615, A Munoz Villa (3 (3), 0/3)
Madrid, Clinica Puerta de Hierro (hem), CIC 728, MN Fernandez (33 (42), 23/10)
Madrid, Hospital Nino Jesus (peds), CIC 732, MA Diaz (36 (42), 14/22)
Madrid, Hospital Universitario San Carlos (hem), CIC 733, J Diaz Mediavilla, L Llorente, R Martinez (35 (35), 0/35)
Madrid, Hospital General La Paz (ads), CIC 734, F Hernandez Navarro, M Canales (36 (39), 7/29)
Madrid, Hospital La Paz Infantil (hem, onco), CIC 734, A Martinez-Rubio, A Sastre (12 (15), 8/4)
Madrid, Unidad de TMO-ONC 4, Hospital Gregorio Maranon, CIC 819, JL Diez Martin (39 (42), 14/25)
Madrid, Clinica Moncloa (hem), JM Fernandez-Ranada, A Escudero (9 (10), 0/9)
Madrid, Clinica Ruber, JM Fernandez-Ranada, A Escudero (17 (17), 0/17)
Madrid, Hospital Ruber Internacional (onco), P Aramburo (0 (0), 0/0)
Madrid, Hospital Universitario de Getafe (hem), F Oña Compan, N Somolinos (5 (5), 0/5)
Madrid, Fundacion Jimenez Diaz (hem, onco), CIC 309, J Tomas, C Paniagua, F Lobo (20 (21), 6/14)
Madrid, Hospital Militar Gomez Ulla, F Sancho-Cuesta, S Enrech-Frances (0 (0), 0/0)
Malaga, Hospital Regional (hem), CIC 576, M Gonzalez, M Pascual (28 (29), 9/19)
Murcia, Hospital Univ "Virgen de la Arrixaca", CIC 323, A Morales-Lazaro, MJ Majado-Martinez (6 (6), 0/6)
Murcia, Hospital Morales Meseguer, CIC 735, JM Moraleda Jimenez, V Vicente-Garcia, I Heras ((30 (37), 7/23)
Orense, Hospital Cristal-Pinor (hem), J-L Sastre-Moral (12 (13), 0/12)
Oviedo, Hospital Covadonga (hem), CIC 642, D Carrera Fernandez (34 (40), 6/28)
Palma de Mallorca, Hospital Son Dureta (hem), CIC 722, J Besalduch, M Canaro (27 (28), 9/18)
Palma de Mallorca, Policlinica Miramar, J Besalduch, A Sampol (2 (2), 0/2)
Pamplona, Hospital Provincial de Navarra (hem), CIC 577, E Pérez Equiza, MJ Uriz Pascual, J Gastearena (16 (16), 0/16)
Pamplona, Clinica Universitaria de Navarra, CIC 737, J Rifon (25 (29), 4/21)
Pontevedra, Hospital Montecelo (onco), CIC 549, M Constela (3 (3), 0/3)
Salamanca, Hospital Clinico (hem), CIC 727, D Caballero (73 (88), 25/48)
San Sebastian, Hospital Nostra Senora de Aranzazu, CIC 598, R Lasa, J Marin, D Martinez (35 (46), 1/34)
Santander, Hospital Universitario M de Valdecilla (hem), CIC 242, A Iriondo, E Conde (59 (68), 22/37)
Santiago de Compostela, Hospital Xeral de Galicia (hem), CIC 570, JL Bello (20 (20), 8/12)
Sevilla, Hospital Universitario Virgen del Rocio, CIC 769, JM Rodriguez Fernandez (62 (62), 26/36)
Tarragona, Hospital de Tarragona Joan XXlll (hem), A Llorente Cabrera (10 (10), 0/10)
Valencia, Hospital Clinico Universitario (hem, onco), CIC 282, J Garcia-Conde, CSolano (29 (30), 9/20)

Valencia, Hospital Infantil La Fe (peds, onco), CIC 653, V Castel, A Verdeguer, JM Fernandez (22 (26), 9/13)
Valencia, Hospital Universitario La Fe (hem), CIC 663, MA Sanz, GF Sanz (79 (97), 34/45)
Valencia, Hospital Doctor Peset (hem), P Ribas Garcia (7 (7), 0/7)
Valencia, Instituto Valenciano de Oncologia, I Picón (5 (5), 0/5)
Valladolid, Hospital Rio Hortega, CIC 611, J Garcia Frade (16 (19), 0/16)
Vigo, Hospital Xeral-Cies, A Martinez-Dalmau (20 (23), 2/18)
Zaragoza, Clinico Universitario Lozano Blesa (hem), CIC 531, M Gutierrez, J Moreno, L Palomera (15 (16), 0/15)
Zaragoza, Clinico Universitario Lozano Blesa (onco), A Tres, J Mayordomo (7 (7), 0/7)
Zaragoza, Hospital Miguel Servet (hem + onco) M Giralt, G Pérez-Lugmus, D Rubio-Félix, A Anton (27 (27), 3/24)

Sweden (9 teams; 485 (542), 149/336)
Goteborg, CHECT (ads + peds), CIC 289, M Brune, A Fasth, (101 (122), 32/68)
Huddinge, University Hospital (hem, onco), CIC 212, P Ljungman (91 (102), 56/35)
Linköping, University Hospital (hem), CIC 740, G Juliusson (47 (48), 14/33)
Lund, University Hospital (hem), CIC 283, AN Bekassy, S Lenhoff (72 (81), 15/57)
Malmö, University Hospital, I Turesson, T Ahlgren (7 (7), 0/7)
Örebro, University Hospital (hem, onco), CIC 738, U Tidefelt (10 (14), 0/10)
Stockholm, Karolinska Hospital (hem), CIC 626, M Björkholm (41 (41), 0/41)
Umea, Norrland University Hospital, CIC 731, A Wahlin, V Lazarevic, J Lindh, B Markevärn (43 (48), 7/36)
Uppsala, University Hospital (ads + peds), CIC 266, I Hassan, G Oberg (73 (79), 25/48)

Switzerland (10 teams; 354 (465), 114/240)
Aarau, Kantonsspital (hem, onco), CIC 316, M Wernli, M Bargetzi (30 (41), 0/30)
Basel, Kantonsspital (hem, onco), CIC 202, A Gratwohl, T Kühne, R Herrmann (63 (84), 50/13)
Bellinzona, Ospedale San Giovanni (hem, onco), CIC 829, F Cavalli, M Ghielmini L Leoncini (16 (20), 0/16)
Bern, Inselspital (ads, peds, hem, onco), CIC 221, K Leibundgut, C Zwicky, M Fey (54 (88), 0/54)
Geneva, Hôpital Cantonal Universitaire (hem, onco), CIC 261, B Chapuis, Y Chalandon, P Wacker (26 (29), 26/0)
Lausanne, CHUV (hem, onco), CIC 820, M Schapira, T Kovacsovics, S Leyvraz, N Ketterer (65 (78), 0/65)
St Gallen (hem, onco), Kantonsspital, CIC 324, U Hess (13 (14), 0/13)
Zurich, University Hospital (ads, hem, onco), CIC 208, U Schanz, J Halter, Ch Taverna (64 (86), 23/41)
Zurich, University Hospital (peds, hem, onco), CIC 334, R Seger (20 (20), 15/5)
Zurich, Klinik Im Park (onco), CIC 700, J Gmür, U Breitenstein (3 (5), 0/3)

Tunisia (1 team; 67 (74), 34/33)
Tunis, Centre National de Greffe de Moelle Osseuse, CIC 183, B Othman (67 (74), 34/33)

Turkey (26 teams; 493 (517), 203/290)
Ankara-Sihhiye, Hacettepe University (hem), CIC 168, H Goker, O Ozcebe, I Haznedaroglu, S Dundar (12 (12), 8/4)
Ankara-Besevler, Gazi University (hem), CIC 169, R Haznedar (8 (8), 2/6)
Ankara, Hacettepe University, Institute of Oncology, CIC 292, E Kansu, Y Koc, E Ozdemir (38 (40), 8/30)
Ankara-Etlik, GATA BMT Center, CIC 372, F Arpaci, A Özet, C Beyan, A Ural (49 (53), 16/33)
Ankara, Ihsan Dogramaci Childrens Hospital, ATuncer, D Uckan (16 (16), 16/0)
Ankara, University School of Medicine Ibni Sina Hospital (hem), CIC 617, G Gürman (60 (68), 32/28)
Ankara, University of Ankara (peds), CIC 620, E Unal (17 (17), 12/5)
Ankara, Numune Education and Research Hospital, CIC 691, M Ayli (60 (62), 37/23)
Antalya, Akdeniz University Hospital (peds), CIC 618, MA Yesilipek, V Hazar, O Yegin (19 (19), 14/5)
Antalya, Akdeniz University Hospital (hem), CIC 685, L Undar (16 (17), 3/13)
Aydin, Adnan Menderes University Medical Faculty (hem), CIC 187, Z Bolaman (3 (3), 1/2)
Balcali (Adana), Cukurova University Hospital (peds, hem, onco), CIC 821:1, A Tanyeli (0 (0), 0/0)
Balcali (Adana), Cukurova University Hospital (ads, onco), CIC 821:2, B Sahin (14 (14), 0/14)
Bornova-Izmir, Ege University Medical Faculty (peds), CIC 621, S Kansoy (7 (7), 3/4)
Bornova-Izmir, Ege University Medical Faculty (ads, hem), CIC 628, S Cagirgan (55 (58), 10/45)
Eskisehir, Osmangazi University, CIC 686, Z Güblas (8 (11), 2/6)
Istanbul, Maltepe Medical Faculty, CIC 210, K Ozerkan, A Tamkan*
Istanbul, Marmara University (hem), Altunizade, CIC 714, T Akoglu (7 (7), 1/6)
Istanbul, University of Istanbul, CIC 760, S Kalayoglu-Besisik (21 (21), 8/13)
Istanbul, Cerrahpasa Medical School, CIC 761, B Ferhanoglu, T Soysal, Z Baslar (26 (27), 12/14)
Istanbul, Tip Fakultesi (peds, hem, onco), CIC 762, G Gedikoglu (5 (5), 4/1)
Istanbul, GATA Haydarpasa Egitim Hast (hem, onco), CIC 687, A Öztürk*
Istanbul, Institute of Oncology, CIC 689, H Onat, M Basaran*
Izmir, Dokuz Eylul University (onco), CIC 688, U Yilmaz (8 (8), 0/8)
Kayseri, Erciyes University Hospital (hem, onco), CIC 627, A Unal, M Cetin (32 (32), 10/22)
Trabzon, Karadeniz Technical University (hem), CIC 170, E Ovali (12 (12), 4/8)

Ukraine: (2 teams; 31 (36), 1/30)
Kiev, Kiev City BMT Center, CIC 176, E Karamanescht, V Khomenko, I Korenkova, S Borodkin (31 (36), 1/30)
Kiev, Kiev Regional Oncologic Hospital (peds, hem, onco), CIC 177, S Donska, O Ryzhak*

United Kingdom (54 teams; 2209 (2380), 785/1424)
Aberdeen, The Royal Infirmary (hem), CIC 344, DJ Culligan (17 (18), 0/17)
Bangor, Gwynedd Hospital (hem, onco), CIC 736, M Gilleece (10 (11), 0/10)
Bath, Royal United Hospital (hem), CIC 619, C Knechtli (16 (16), 0/16)
Belfast, Belfast City Hospital (hem), CIC 268, F Jones, TCM Morris, P Abram (35 (35), 6/29)
Birmingham, Heartlands Hospital (hem), CIC 284, DW Milligan (55 (62), 10/45)
Birmingham, Queen Elizabeth Hospital (hem), CIC 387, C Craddock, P Mahendra (101 (105), 37/64)
Birmingham, The Birmingham Childrens Hospital (hem), CIC 781, PJ Darbyshire (41 (42), 24/17)
Bournemouth, Royal Bournemouth Hospital (hem), Poole Hospital, Dorset Cancer Centre and Salisbury District Hospital, CIC 765, S Killick, J Cullis (13 (13), 0/13)
Bristol, Royal Hospital for Children (allo, ads, peds), CIC 386:1, JM Cornish, D Marks (56 (72), 49/7)
Bristol, Avon Haematology Unit (auto), CIC 386:2, R Evely, J Bird (27 (29), 0/27)
Cambridge, Addenbrooke's Hospital (hem), CIC 566, C Crawley, RE Marcus, J Craig, H Balsdon, T Chapman (56 (59), 16/40)
Cardiff, University Hospital of Wales (hem), CIC 303, KMO Wilson, AK Burnett, JA Whittaker, CH Poynton (50 (55), 13/39)
Cheltenham, Cheltenham General Hospital, E Blundell (19 (19), 0/19)
Coventry, University Hospital & Warwickshire NHS Trust, J Mills (15 (15), 0/15)
Dundee, Ninewells Hospital (hem), CIC 719, D Meiklejohn (4 (4), 0/4)
Edinburgh, Western General Hospital, (hem) CIC 228, JMDavies, PRE Johnson, MJ Mackie, PH Roddie, P Shepherd (34 (34), 4/30)
Exeter, Royal Devon and Exeter Hospital (hem), CIC 571, M Joyner (16 (16), 0/16)
Glasgow, Royal Infirmary, CIC 244, A Parker, IG McQuaker (63 (65), 35/28)
Glasgow, The Western Infirmary (hem), CIC 325, T Fitzsimons (18 (20), 0/18)
Glasgow, Royal Hospital for Sick Children (hem), CIC 707, B Gibson (11 (11), 7/4)
Leeds, St James's University Hospital & The General Infirmary, CIC 254, S Kinsey, G Cook (121 (128), 24/97)
Leicester, Royal Infirmary (hem), CIC 713, AE Hunter (42 (45), 16/26)
Liverpool, Royal Liverpool University Hospital (hem), CIC 501, RE Clark, A Pettitt (42 (47), 17/25)
Liverpool, Alder Hay, CIC 773, M Caswell (9 (9), 3/6)
London, Hammersmith & Charing Cross Hospital, CIC 205, J Apperley, E Olavarria, E Kanfer, A Rahemtulla, R Szydlo (130 (145), 51/79)

London, Royal Free Hospital (hem), CIC 216, M Potter (51 (51), 30/21)
London, Royal Marsden Hospital (hem), CIC 218, M Ethell, J Mehta (128 (154), 23/105)
London, University College Hospital (onco), CIC 224, J Whelan (11 (13), 0/11)
London, University College Hospital (hem), CIC 224, S MacKinnon (142 (147), 51/91)
London, Great Ormond Street Hospital, CIC 243, P Veys (51 (52), 45/6)
London, The London Clinic (hem), CIC 263, PJ Gravett (20 (21), 10/10)
London, St George's Hospital (hem), CIC 539, J Marsh, S Ball, EC Gordon-Smith (23 (25), 13/10)
London, Guy's Hospital (hem), CIC 721, S Schey (35 (35), 8/27)
London, King's College (hem), CIC 763, A Pagliuca, GJ Mufti (116 (127), 75/41)
London, St Bartholomew's, CIC 768 and the Royal London Hospital, J Cavenagh, S Agrawal, T Lister (64 (68), 11/53)
Manchester, Royal Children's Hospital, CIC 521, AM Will (14 (19), 13/1)
Manchester, The Royal Infirmary, JA Yin (45 (49), 31/14)
Manchester, Christie Hospital (hem), CIC 780, E Liakopoulou (60 (65), 19/41)
Manchester, Trafford General Hospital, PA Carrington (3 (3), 0/3)
Newcastle upon Tyne, Royal Victoria Infirmary, CIC 276, GHJackson, SJ Proctor, P Taylor, A Cant, R Skinner (89 (97), 37/52)
Norwich, Norfolk and Norwich Hospital (hem), CIC 391, J Parker, G Turner (5 (5), 0/5)
Nottingham, City Hospital, CIC 717, N Russell, JL Byrne, AP Haynes, A McMillan (102 (111), 46/56)
Oxford, John Radcliffe Hospital (hem, onco), Headington and Wycombe General, CIC 255, TJ Littlewood, C Bunch, C Mitchell, CHatton, G Hall, J Wainscoat (47 (47), 17/30)
Plymouth, Derriford Hospital, CIC 823, MD Hamon (41 (42), 14/27)
Salford, Hope Hospital, PA Carrington (4 (4), 0/4)
Sheffield, Royal Hallamshire Hospital – J Snowdon, Weston Park Hospital – L Evans,
Rotherham General Hospital – H Barker and the Children's Hospital – A Vora, CIC 778:1/2/3/5 (54 (61), 15/39)
Somerset, Taunton and Somerset Hospital SA Johnson, S Bolam (13 (13), 0/13)
Southhampton, CRC Wessex, CIC 704, K Orchard, A Duncombe, J Kohler (53 (57), 15/38)
Stoke-on-Trent, North Staffordshire Royal Infirmary (hem), CIC 394, R Chasty (8 (9), 0/8)
Sunderland, The Sunderland Royal Hospital, PJ Carey (2 (2), 0/2)
Swansea, Singleton Hospital, Skett, S Al Ismail (11 (12), 0/11)
Swindon, Great Western Hospital (Hem), CIC 608, NE Blesing, A Gray, S Green, A Koster (4 (4), 0/4)
Wakefield, The Mid Yorkshire Hospitals NHS Trust, Pinderfields Hospital, CIC 254, M C Galvin, P Hillmen (12 (12), 0/12)

Yugoslavia (*Serbia and Montenegro*) (4 teams; 26 (27), 10/16)
Belgrade, Mother and Child Health Institute, CIC 358, D Vujic (2 (2), 0/2)
Belgrade, Clinical Centre of Serbia (hem), CIC 373, M Colovic, A Bogdanovic (0 (0), 0/0)
Belgrade, Military Medical Academy (hem), CIC 582, M Malesevic (24 (25), 10/14)
Novi Sad, Institute of Internal Diseases, Clinical Centre of Novi Sad (hem), CIC 655, D Pejin*

*No report
Totals 21028 (25207), 7091/13937
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