Evaluation and Counseling of Candidates

11

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11.1 Evaluation of Candidates and Risk Factors for HSCT

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11.1.1 Introduction

The evaluation of candidates and the analysis of individual risk factors for HSCT permit to establish four fundamental aspects:

1. The HSCT indication
2. To inform the patient properly
3. To choose the best donor, conditioning, and post-HSCT IS
4. To evaluate the results of the transplant in large series

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11.1.2 Candidates' Evaluation Work Flow

11.1.2.1 First Visit

The most relevant aspects to take into account in this first visit are:

- Medical history (past and present) and physical examination (see Sect. 11.1.2.4).
- Review of diagnostic tests (in referred patients).
- Revaluate HLA typing of patient and potential donors (if allo-HSCT).
- Preliminary information on:
  - Therapeutic options and results
  - HSCT procedure
  - Possible complications and side effects (see specific chapters in Part V)
- Schedule reevaluation of the current status of the disease (see Sect. 11.1.3).
- Schedule visits with radiation therapist (if TBI), dentist, gynecologist, blood bank (list of blood/platelet donors), HSCT unit supervisor nurse, etc.
- Signature of the informed consent for HSCT and for procurement of HSC (if auto-HSCT).

11.1.2.2 Visit Preharvesting (Auto-HSCT)

- Assess the results of complementary explorations.
- Complete information on the procedure.

E. Carreras et al. (eds.), *The EBMT Handbook*, https://doi.org/10.1007/978-3-030-02278-5_11

- If PBSC, assess the status of venous accesses. Program CVC (if necessary) and mobilization schedule.
- If BM: preanesthetic visit.
- Program manipulation of HSCT (if applicable) and/or cryopreservation.

11.1.2.3 Last Visit Before Admission

- Final and complete patient information (see Sect. 11.1.2.5).
- Evaluate reevaluation studies performed (see Sect. 11.1.3).
- Schedule admission and conditioning treatment.
- If necessary, program CVC placement.
- If allo-HSCT: confirm that the donor's evaluation is correct and there are no contraindications for donation (see Chap. 12).
- If auto-HSCT: confirm that the cryopreserved cellularity is correct.
- Submit donor and recipient information to the blood bank (group, CMV serology, previous transfusions, etc.).
- If TBI: confirm that the dosimetry has been carried out and the RT has been programmed.
- Confirm storage of patient and donor samples for serotheque and cellular library.

11.1.2.4 Medical History

Collect information on:

Medical background; childhood illnesses and vaccines; allergies and adverse drug reactions; surgical interventions (previous anesthesia); medications not related to the basic process; previous transfusion history, family tree, and family history valuable; in women, menarche/menopause, pregnancy and childbirth, contraceptive methods, date last rule, and gynecological checkups

Travel to malaria, trypanosomiasis, and HTLV-I/II endemic areas

Previous relevant infections

Data about the current illness:

- Start date and initial symptomatology
- Diagnostic methodology used (staging)
- Chemotherapy and radiotherapy treatments (doses and dates)
- Complications from such treatments
- Result of these treatments
- Recurrences and their treatment
- Transfusions received
- Current state of the disease

Social aspects

- Smoking, alcoholism, and other drug use
- Sexual habits
- Availability of accommodation close to the center and means of transport
- Support family members
- Ethnic, cultural, and intellectual aspects

11.1.2.5 Information to Provide (See Detailed Information in Counseling Section)

Ask the patient (privately) which escorts he or she wishes to have present in this session. For adolescents follow the rules of each country respecting the right of information. Transmit as much information as possible in writing. She/he must be informed about:

- Most frequent early and late complications (see specific chapters in Parts V and VI) including graft failure, GI complications, alopecia, SOS/VOD, acute GVHD, early infections, chronic GVHD, late infections, relapse of the disease, infertility, endocrine complications, neoplasms, and other secondary.
- Treat specifically serious complications (ICU admissions) and possibility of death. Inform about the advance directive registry. Agreeing with the patient on an interlocutor in case at some point they may not be able to make decisions.
- Estimated duration of admission, approximate day of admission.
- Most frequent complications on discharge, outpatient follow-up, likelihood of readmission, and need for caregivers at discharge.

11.1.3 Complementary Explorations

All the following studies must be performed within 30 days prior to the HSCT except the assessment of baseline disease status (7–15 days) and the pregnancy test (7 days):

- CBC and basic coagulation; complete biochemistry (including ferritin); blood type and

Rh/irregular antibodies; dosage of Igs; serology CMV, EBV, VHS, VVZ, toxoplasma, syphilis, HBsAg, HBcAb, and anti-HBsAb (HTLV-I/II, and Chagas disease according to the patient's origin); NAT for HCV, HBV, and HIV; pregnancy test
- Chest x-ray; respiratory function tests (including FEV1 and DLCO); electrocardiogram; echocardiogram or isotopic ventriculography (depending on previous treatment)
- Reevaluation of the disease (MRD) (see specific chapters in part IX)
- Dental evaluation; gynecological evaluation; psychological/psychiatric evaluation
- Nutritional assessment
- HLA typing (recheck) (see Chap. 9)

11.1.4 Risk Assessment

11.1.4.1 Individual Risk Factors

There are a group of variables that have a prognostic value in all predictive models

Variables	High risk
Age	Older. Do not use as a single criterion. Relative importance
General condition	Karnofsky index <80%
Disease	Not in remission. See specific chapters
Type of donor	Others than HLA-identical siblings
HLA compatibility	Any HLA-A, HLA-B, HLA-C, and DRB1 difference
CMV serology	Different serology than the donor
Donor	Age >35–40 years For male recipient, female donor (especially if multiparous)
Interval diagnosis-HSCT	Prolonged (relevant in CML and SAA)
Comorbidities	See HCT-CI model
Iron overload	Present
Experience of the center	Non-JACIE/FACT accredited centers

11.1.4.2 Predictive Models

Disease Risk Index (DRI) (Armand et al. 2012, 2014)

Prognostic index based in the disease and its status at HSCT. It doesn't take into account factors as age or comorbidities. This score index classifies the disease in four prognostic groups and anticipates overall survival, progression-free survival, cumulative incidence of relapse, and cumulative incidence of non-relapse mortality (see Table 11.1).

Table 11.1 Disease risk index (Armand 2012, 2014)

Risk	Disease		
Low	AML with favorable cyt., CLL, CML, indolent B-cell NHL		
Intermediate	AML intermediate cyt., MDS intermediate cyt., myeloproliferative neoplasms, MM, HL, DLBCL/ transformed indolent B-NHL, MCL, T-cell lymphoma nodal		
High	AML adverse cyt, MDS adverse cyt, T-cell lymphoma extranodal		
Risk	Stage		
Low	CR1, CR≥2, PR1, untreated, CML CP, PR≥2 (if RIC)		
High	PR≥2 (if MAC), induction failure, active relapse, CML AP or BP		
Disease risk	Stage risk	Overall risk	OS at 4 years
Low	Low	Low	64% (56–70%)
Low	High	Intermediate	46% (42–50%)
Intermediate	Low		
Intermediate	High	High	26% (21–31%)
High	Low		
High	High	Very high	6 (0–21%)

Adapted from Armand (2012). *Cyt.* cytogenetics

EBMT Risk Score (Gratwohl et al. 1998, 2009)

This predictive score, validated with 56,505 patients, permits to predict approximately the 5-year probability of OS and the TRM for the main diseases (see Tables 11.2, 11.3, and 11.4).

EBMT risk score is also useful to predict OS and TRM in patients receiving a second HSCT (Rezvani et al. 2012) and in those receiving a TCD HSCT (Lodewyck et al. 2011).

Some authors have introduced modifications in this risk score (including the concept of disease stage) to improve its predictivity (Terwey et al. 2010; Hemmati et al. 2011). Similarly, it has been associated with the HCT-CI (Barba et al. 2014).

This score has been validated by many groups and for many diseases (AML, ALL, PMF, CLL, and CML, among others).

Table 11.2 EBMT risk score (Gratwohl 2009)

Variables	Value of variables	Points
Age	<20 years	0
	20–40 years	1
	>40 years	2
Disease status[a]	Early	0
	Intermediate	1
	Advanced	2
Interval diagnosis-HSCT[b]	<12 months	0
	≥12 months	1
Donor	HLA-identical sibling	0
	Unrelated donor	1
Gender donor – recipient	Female to male	1
	Other combinations	0

Adapted from Gratwohl (2009)
[a]Do not apply in patients with SAA. Early = AL in CR1; MDS in CR1 or untreated; CML in 1st chronic phase; NHL/MM untreated or in CR1. Intermediate = AL in CR2; CML in other status than accelerated phase or blastic phase; MDS in CR2 or in PR; NHL/MM in CR2, PR, or stable dis. Late = AL in other stages; CML in blastic crisis; MDS in all other stages; NHL/MM in all other stages
[b]Do not apply to patients in CR1

Table 11.3 Probability (%) of TRM at 5 years applying the EBMT risk score

Points	0	1	2	3	4	5	6–7
AML	14	20	25	30	36	40	41
ALL	15	23	24	30	40	47	53
CML	15	22	30	38	45	52	55
AA	18	26	40	49	52		
MDS	25	28	30	35	38	46	50
MM			29	35	40	42	52
NHL	15	24	28	30	34	36	38

Extracted from Gratwohl (2009)

Table 11.4 Probability (%) of OS at 5 years applying the EBMT risk score

Points	0	1	2	3	4	5	6–7
AML	68	59	52	38	30	23	18
ALL	66	52	43	38	22	16	14
CML	76	72	60	51	39	26	14
AA	81	72	60	49	45		
MDS	56	52	46	40	35	28	25
MM			48	40	36	22	17
NHL	75	59	50	48	43	40	38

Extracted from Gratwohl (2009)

HCT-Comorbidity Index (HCT-CI) (Sorror et al. 2005)

Developed in Seattle in 2005. It is an adaptation to the HSCT of the classical Charlson Comorbidity Index (CCI). Validated in several cohorts and widely used. The score analyzes 17 comorbidities as well as their degree (see Table 11.5).

Given the impact of age on outcomes, the authors modified the model (Sorror et al. 2014), including a 1-point score for patients aged 40. This modification significantly improved the predictive capacity of the model. Consequently, the patients could be classified in three different risk groups (0 points, low risk; 1–2 points, intermediate risk; 3 or more, high risk) that clearly correlated with 2-year NRM.

Other authors re-stratified the HCT-CI index (flexible HCT-CI) as low risk, 0–3 points; intermediate risk, 4–5 points; and high risk, >5 points, being this classification a better predictor for NRM. In RIC setting, the 100-day and 2-year NRM incidence in these risk categories was 4%, 16%, and 29% and 19%, 33%, and 40%, respectively. They do find this predictive NRM value using neither the original HCT-CI nor the PAM or CCI models. Regarding the 2-year OS, this flexible HCT-CI score was also associated with the highest predictive hazard ratio (Barba et al. 2010).

HCT-CI has also been validated in CD34+ selected HSCT (Barba et al. 2017) and associated with the EBMT risk score that permits a better stratification (Barba et al. 2014).

Pretransplantation Assessment of Mortality (PAM) Score (Parimon et al. 2006; Au et al. 2015)

Developed in Seattle in 2006 but underused and poorly validated. It combines eight variables from patients and HSCT. Only useful for assessing mortality at 2 years.

Variables included age, type of donor, risk of disease, intensity of conditioning, DLCO, FEV1, creatinine, and ALT.

EBMT Machine Learning Algorithm (Shouval et al. 2015)

Based in an alternating decision tree able to detect variables associated with the primary

Table 11.5 HSCT-comorbidity index including age variable (Sorror 2005, 2014)

Comorbidity/definition	Points
Age ≥ 40 years	1
Arrhythmia Atrial fibrillation, flutter, sick sinus node syndrome, or ventricular arrhythmias	1
Cardiac Coronary heart disease, congestive heart failure, IAM, FEVE ≤50%	1
Inflammatory bowel disease Crohn's disease or ulcerative colitis that has required treatment	1
Diabetes Requiring insulin or oral antidiabetic medication in the 4 weeks prior to HSCT	1
Cerebrovascular CVA or TIA or cerebral thrombosis	1
Psychiatric Depression or anxiety or others requiring ongoing treatment (not on demand)	1
Mild liver Chronic hepatitis, elevated bilirubin <1.5 × NV or AST/ALT <2.5 × NV Previous HBV or HCV infection	1
Obesity BMI >35 kg/m^2	1
Previous infection Infection in admission requiring continuation of treatment beyond day 0	1
Moderate lung DLCO and/or FEV1 66–80% or minimal stress dyspnea	2
Rheumatology Systemic lupus, rheumatoid arthritis, polymyositis, polymyalgia rheumatica, connective tissue disease	2
Peptic ulcer Endoscopic or radiological diagnosis (does not score if only reflux or gastritis)	2
Renal Creatinine >176 mcmol/L, dialysis, or previous kidney transplant	2
Previous tumor[a] Neoplasia at some point (excludes non-melanoma skin tumor)	3
Heart valve Diagnosed (except mitral prolapse)	3
Severe pulmonary DLCO and/or FEV1 ≤%, dyspnea at rest or oxygen at home	3
Severe liver disease Bilirubin ≥0.5 for VN or AST or ALT ≥0.5 for VN or cirrhosis	3

[a]A most recent version also includes in this category hematological/tumors of a different lineage to that which motivates the transplant (e.g., lymphoma in an AML patient but not previous MDS in AML patient)

outcome, assigning weights and ignoring redundancies. This score was developed to analyze the NRM at day +100 in patients with acute leukemia but also predict NRM, LFS, and OS at 2 years.

The variables included in the model are age, Karnofsky (≥80; <80), diagnostic (AML; ALL), disease stage (CR1; CR2; all other stages), interval diagnostic-HSCT (<142 days; ≥142 days), donor-recipient CMV status (both (sero +); both (sero -); any other combination), donor type (MSD; MUD), conditioning (MAC; RIC), and annual allo-HSCT performed in the center (<20; ≥21). The total +100 NRM and 2-year NRM, LFS, and OS could be obtained through a web page: http://bioinfo.lnx.biu.ac.il/~bondi/web1.html.

Recently this algorithm has also been validated by an independent set of data from GITMO (Shouval et al. 2017).

11.1.4.3 Predictive Capacity of These Models

Unfortunately, all these models have a relatively low predictive capacity, and none of them stand out more than the rest.

Author	Predictive/s model/s	Predictive capacity
Sorror et al. (2005)	HCT-CI	0.65
Xhaard (2008)	rHCT-CT, PAM	0.49, 0.57
Gratwohl (2009)	EBMT	0.63
Barba et al. (2010)	fHCT-CI, PAM	0.67, 0.63
Barba et al. (2014)	HCT-CI, EBMT	0.60, 0.54
Versluis (2015)	(HCT-CI-EBMT)	0.58, 0.58 (0.64)

Courtesy of P. Barba, MD. rHCT-CI = reduced model, without PFTs; fHSCT = flexible model (modified scale)

11.1.5 Practical Applications of Risk Assessment

Election of the conditioning	In patients with a high risk of NRM following one of the mentioned risk scores, a RIC should be considered
Relative contraindications	Uncontrolled infection, severe or chronic liver disease (excluding cirrhosis), severe disturbances in heart function (FEV <40%), respiratory (DLCO <40%) or renal (creatinine clearance <30 mL/min)
Absolute contraindications	Pregnancy Cirrhosis. Even compensated cirrhosis receiving RIC have a high likelihood of hepatic decompensation (Hogan et al. 2004)

Key Points

- The evaluation of a candidate must be carried out according to a preestablished work plan designed by each institution. The use of standardized procedures reduces the risk of errors or omissions
- Several pretransplant variables (such as age) have a clear impact on the results of the procedure but, when assessed in isolation, are highly insufficient to predict the results
- Predictive models (DRI, EBMT risk score, HCT-CI, PAM) allow a much more realistic approach to the real possibilities of a given candidate and adapt the procedure to their needs

11.2 Counseling of Candidates

Alessandro Rambaldi

11.2.1 Introduction

Allo-HSCT is a potentially curative treatment modality for otherwise incurable diseases. Unfortunately, after transplantation patients may experience not only the persistence or recurrence of their own disease but also some dramatic clinical complications and toxicities, including death. The clinical indications to transplant have been addressed in the section "indications" of this book, but in general, when the allo-HSCT is advised, the strength of the indication (the likelihood to be cured by transplant), the patient fitness, and his/her personal commitment to transplant must be carefully evaluated for each candidate.

Obviously, a first distinction must be done between patients with a neoplastic versus a non-neoplastic disease, and the transplant option should be progressively discussed with the patient during the course of the disease, particularly in the case of hematologic malignancies. Many professionals should concur to illustrate the patients the curative potential of an allo-HSCT and to help understanding the severe complications that can eventually develop. It is clear that different indications remarkably affect the way a patient is advised. However, there is a time when the transplant option must be formally presented and advised. Therefore, evaluation of each transplant candidate must be based on well-predefined formal standard operating procedures to collect exhaustive clinical, instrumental, and laboratory data that may lead to a robust definition of the risks and benefits related to allo-HSCT. All in all, the counseling is to tailor such evaluation to the individual patients (Shouval et al. 2015), according to both objective data and subjective data such as patient propensity and fear of side effects. At the end of this process, the patient should be aware of the rationale, the

benefit and the toxicity associated with each step, and component of the transplant procedure. In this chapter, I will hereby summarize the main topics I cover with my patients when they come to my office to discuss the option of the allo-HSCT.

11.2.2 Understanding the Benefit and Risk of Allogeneic Transplant

Patients must be informed that allo-HSCT is a therapeutic option that is always proposed with the intent to achieve a permanent cure of the underlying disease, but despite this premise, disease progression or relapse may eventually happen. The indication to allo-HSCT depends not only on the disease characteristics but also on patient-related factors such as age and comorbidities (Sorror et al. 2007) so that the transplant proposal is the result of an accurate and wise evaluation of both these factors (Sorror et al. 2013; Wang et al. 2014).

The patient should understand the specific risk/benefit balance associated with a conventional versus a transplant-based proposal, and this may be remarkably different if he has been diagnosed with a non-neoplastic disease such as thalassemia or sickle cell anemia, a bone marrow failure syndrome like aplastic anemia, or a blood cancer, such as an acute leukemia. Even when allo-HSCT may in theory represent the most efficacious treatment modality to get a permanent cure of a specific disease, an accurate description of the available alternatives must be presented. This is particularly important when the non-transplant options, albeit not curative, may have the chance to keep the patient alive for a long time (Samuelson Bannow et al. 2018) or, even more importantly, when the conventional treatment may lead to a definitive cure such as in the case of some patients with acute leukemia with intermediate-risk genetic factors or those achieving a deep molecular remission after conventional chemotherapy (Cornelissen and Blaise 2016).

11.2.3 Understanding the Transplant Procedure: The Donor, the Conditioning Regimen, and the Clinical Complications

Once the indication to transplant has been confirmed, patients and their relatives must be informed on how the transplant is performed. Patients should understand that identifying a stem cell donor is an absolute prerequisite to perform a transplant. Accordingly, patients should be informed about the human leukocyte antigen (HLA) genetic system, its specificity for each individual, how it is inherited by parents according to the Mendelian laws, and what is the probability to find a compatible donor in the family group. Understanding the HLA system is crucial to explain why the use of a HLA family-matched sibling donors is considered standard and when such a sibling is not available; an international search has to be performed to identify a HLA-compatible unrelated donor. It is important to underline that more than 30 million of potentially available donors are registered by the World Marrow Donor Association (WMDA), and the probability to find a compatible donor is between 50 and 80% according to the ethnical origin of each patient.

Once such matched unrelated donor is identified, this type of transplant is considered a standard of care, and its clinical outcome is fully comparable to what was observed when using an HLA-identical sibling. In patients for whom a MSD or a MUD is not available, the patient should be informed that two additional options are available, namely, the use of HSC obtained by a family mismatched donor (commonly defined as haploidentical because sharing only one of the patient's HLA haplotypes) or a banked cord blood units. Patients should understand how the HLA diversity between patient and donor has been overcome by specific programs of in vitro or in vivo manipulation of the graft.

Patients should be reassured that the incidence and severity of GvHD, the most important side effect of allo-HSCT, seems not to be higher than observed with MUD. In addition, patients should know that many single-arm studies reported that

transplants performed with these alternative stem cell sources proved to be effective and safe even when offered to patients of advanced age and/or with existing accompanying illnesses or when the disease was refractory to conventional treatment. All in all, at the present time, the clinical outcome of these alternative types of transplants compares reasonably well with those achieved with MUD. Therefore, the decision to use this type of stem cell source only when an HLA-matched donor is not available is mostly related to the lack of randomized clinical trials that are planned to be performed in the near future.

The goal of an allo-HSCT is to eradicate the patient's hematopoiesis either neoplastic or normal. This is achieved by the delivery of the conditioning regimen and by the lifelong in vivo effect played by the donor's immune system. Most often, high doses of chemotherapy and/or radiation are included in the preparations although remarkable differences exist depending on the disease needing transplant and patient tolerance. The patient should understand that the intensity of the conditioning regimen may be particularly important in the case of hematologic malignancies when the aim to remove most of the neoplastic cells present in the patient's body is the first goal. However, to avoid at least part of the treatment toxicity, the intensity of the preparative regimen can be down-modulated leading to the definition of this preparative regimen as non-myeloablative or reduced intensity. The depletion of the patient bone marrow stem cells induces a prolonged pancytopenia and the need of donor-derived healthy stem cells to grow and establish a new blood cell production system.

The allogeneic HSC, collected from the donor's BM or PB or a frozen CBU, are infused through the central venous catheter into the bloodstream: HSCT is not a surgical procedure and it is very similar to receiving a blood transfusion. The stem cells find their way into the bone marrow and begin reproducing and growing new, healthy blood cells. It is very important to explain how the donor immune system will develop progressively after transplantation and will either exert a crucial beneficial role against residual neoplastic cells or restore the immune competence against infections, but it could mediate the most harmful GvHD effect against the patient.

After the transplant, supportive care is given to prevent and treat infections, side effects of treatments, and complications. Prolonged anemia, thrombocytopenia, and leukopenia can be dangerous and even life-threatening. A low platelet count can be potentially associated with bleeding in the lungs, GI tract, and brain. Leukopenia, including either a defect of neutrophils and lymphocytes, leads to the development of frequent infections, the most common clinical complications after transplantation. Infections can include not only bacterial, most likely when the patient has a severe bone marrow suppression, but also viral and fungal pathogens. Infections can require an extended hospital stay, prevent or delay engraftment, and/or cause permanent organ damage. On average the time to hematologic engraftment (recovery of the neutrophil and platelet function) is about 2–3 weeks, but a protective recovery of the immune system can take months and sometimes years. High doses of chemotherapy and radiation can cause remarkable toxicities that include but not limited to severe mucositis (inflammation of the mouth and GI tract) that favors bacterial translocation with related infections and GvHD and multi-organ failure mainly the lung, heart, liver, and kidney.

A particular attention should be paid to risk of graft failure that can occur early or late after transplantation. A graft failure is more frequent in some diseases such as myelofibrosis or as the results of infections or when the stem cell content of the graft is insufficient to guarantee a durable engraftment. A graft rejection can also happen after reduced intensity conditioning regimen (when the immune system of the host is not completely eradicated and can actively reject the donor stem cells).

Finally, and most importantly, patients must be aware of what GvHD is, when and how it may develop, and why it represents the most serious complication of a HSCT, being not only life-threatening but also the principal reason of a long-lasting poor quality of life. Transplant candidates should be aware that GvHD is the negative counterpart of the deep interaction of the donor immune system within patient body that at the same time may lead to definitive cure of an

otherwise incurable disease. In other words, when transplant is advised, patients must realize that they are accepting the possible onset of a chronic, often invalidating, autoimmune disease. GVHD can appear at any time after transplant. GvHD is conventionally distinguished in an acute form that usually develops within the first 100 days after transplant and the chronic form that occurs later in the transplant course. Patients who develop acute GVHD are more likely to also develop the chronic form of GVHD. Patients must understand the importance of their compliance to all the treatments given post transplant to prevent GvHD and how this is instrumental for a successful transplant. GvHD occurs when the donor's immune system reacts against the recipient's tissue. At variance to what happens after a solid organ transplant where the patient's immune system is driven to reject only the transplanted organ, in GVHD, the donor immune system can react against many different organs of the recipient. This is why the new cells do not recognize the tissues and organs of the recipient's body as self. Over time, thanks to the effect of immune suppressive drugs, a progressive tolerance can develop. The most common sites for GVHD are the GI tract, liver, skin, and lungs.

Key Points

Counseling of patients should be carefully performed to inform candidates that:

- Disease and patient's specific characteristics are equally important to advise transplant
- Allo-HSCT is performed to cure otherwise incurable diseases
- Despite transplant, disease persistence or relapse may occur
- Transplant can severely compromise the quality of life of patients
- Transplant is a form of immunotherapy requiring long-term follow-up care
- Logistics are important to ensure adequate care and assistance

11.2.4 Logistics

After discharge for the transplant ward, patients are followed up in the outpatient clinic two to three times per week until day +100. Patients should be helped to realize how complex is the transplant procedure and that the time spent in the hospital represents only the first part of the treatment program. All allo-HSCT patients should ideally stay within 1 h of the hospital until it is about 3 months from the day of the transplant. Patients and their families should also realize that the overall recovery time varies from person to person and in general this process takes about 1 year to be satisfactory. Allogeneic transplantation is therefore a long-lasting immunotherapy, and the interaction between the donor immune system and the patient requires a careful and prolonged medical assistance, quite often long life.

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