2019 Recommended Timing for Transplant Consultation

Intent of guidelines
These guidelines identify appropriate timing of consultation for autologous or allogeneic hematopoietic cell transplantation (HCT) based on disease characteristics. Evaluation and coordination of the timing of HCT for eligible patients is determined in collaboration with the transplant center.

The consideration for HCT primarily includes patient and disease characteristics, not age alone, as advances in HCT now permit older patients with selected comorbidities and good functional status to safely undergo HCT for curative intent with a relatively low and acceptable risk of non-relapse mortality. HCT consultations include risk-to-benefit considerations based on risk score assessments.

In many situations, early referral is a critical factor for optimal transplant outcomes. Likewise, delays in referral can reduce success rates for transplant because there may be a narrow window of opportunity to proceed to transplant and delays might preclude transplant altogether. Research data comparing outcomes by disease status can be found at BeTheMatchClinical.org/HCTtiming

If allogeneic transplant is a possibility, HLA typing of the patient (high resolution) and potential family donors should be completed at time of diagnosis, and if no matches are found, a preliminary unrelated donor search of the Be The Match Registry® should be done.

These 2019 guidelines were developed jointly by the National Marrow Donor Program® (NMDP®)/Be the Match® and the American Society for Blood and Marrow Transplantation (ASBMT), and are based on current clinical practice, medical literature, National Comprehensive Cancer Network® (NCCN®) Guidelines for the treatment of cancer and evidence-based reviews.

About the American Society for Blood and Marrow Transplantation (ASBMT)
The American Society for Blood and Marrow Transplantation is an international professional membership association of more than 2,200 physicians, investigators and other health care professionals promoting blood and marrow transplantation, cellular therapy research, education, scholarly publication and clinical standards. Download the ASBMT Practice Guidelines app on iTunes or Google Play for up-to-date access to clinical calculators, practice guidelines, evidence-based reviews and position statements from the ASBMT Committee on Practice Guidelines.
Learn more at ASBMT.org

About the National Marrow Donor Program (NMDP)/Be The Match
We are the global leader in providing a cure to patients with life-threatening blood and marrow cancers like leukemia and lymphoma, as well as other diseases. We manage the world’s largest registry of potential marrow donors and cord blood units, connect patients to their donor match for a life-saving marrow or umbilical cord blood transplant and educate health care professionals and patients. We conduct research through our research program, CIBMTR® (Center for International Blood and Marrow Transplant Research®), in collaboration with Medical College of Wisconsin.
Learn more at BeTheMatchClinical.org

FREE MOBILE APP
Access these guidelines wherever you are
Search for “transplant guide” in your app store.
## Adult Leukemias and Myelodysplasias

### Acute Myeloid Leukemia (AML)

*High-resolution HLA typing is recommended at diagnosis for all patients*

Early after initial diagnosis, all patients with AML including:
- Primary induction failure
- Minimal residual disease after initial therapy
- CR1 – except favorable risk AML [defined as: t(16;16), inv16, or t(8;21) without c-KIT mutation; t(15;17); normal cytogenetics with NPM1 or isolated biallelic CEBPA mutation and without FLT3-ITD]
- Antecedent hematological disease (e.g., myelodysplastic syndromes (MDS))
- Treatment-related leukemia
- First relapse
- CR2 and beyond, if not previously evaluated

### Acute Lymphoblastic Leukemia (ALL) (adult defined as ≥ 40 years)

*High-resolution HLA typing is recommended at diagnosis for all patients*

Early after initial diagnosis, all patients with ALL including:
- Primary induction failure
- Minimal residual disease after initial therapy
- CR1
- First relapse
- CR2 and beyond, if not previously evaluated

### Myelodysplastic Syndromes (MDS)

*High-resolution HLA typing is recommended at diagnosis for all patients*

Any intermediate or high IPSS or IPSS-R score

Any MDS with poor prognostic features, including:
- Treatment-related MDS
- Refractory cytopenias
- Adverse cytogenetics and molecular features
- Transfusion dependence
- Failure of hypomethylating agents or chemotherapy
- Moderate to severe marrow fibrosis

### Chronic Myeloid Leukemia (CML)

- Inadequate hematologic or cytogenetic/molecular response to tyrosine kinase inhibitor (TKI) therapies
- Disease progression
- Intolerance to TKI therapies
- Accelerated phase
- Blast crisis (myeloid or lymphoid)

### Myeloproliferative Neoplasms (MPN)

(including BCR-ABL–negative myeloproliferative neoplasms and later stages of polycythemia vera and essential thrombocytosis)

*High resolution HLA typing is recommended at diagnosis for all patients*

Intermediate- or high-risk disease, including:
- High-risk cytogenetics
- Poor initial response or at progression
### Adult Leukemias and Myelodysplasia (continued)

#### Myelofibrosis (MF)
- DIPSS Intermediate-2 (INT-2) and high risk disease
- DIPSS Intermediate-1 (INT-1) with low platelet counts, red blood cell transfusion dependent, complex cytogenetics
- High risk driver mutations (ASXL1, EZH2, TET2, IDH1, IDH2, SRSF2, and TP53) or triple negative (lack of a driver mutation such as JAK2, MPL, or CALR) should be considered in decision making

#### Chronic Lymphocytic Leukemia (CLL)
- Second or greater relapse following chemoinmunotherapy
- Richter’s transformation

#### Pediatric Acute Leukemias and Myelodysplasia

##### Acute Myeloid Leukemia (AML)

*High-resolution HLA typing is recommended at diagnosis for all patients*

Early after initial diagnosis, all patients with AML including:
- Age <2 years at diagnosis
- Primary induction failure
- Minimal residual disease after initial therapy
- CR1 — except favorable risk AML [defined as: t(16;16); inv16; t(8;21); t(15;17); normal cytogenetics with NPM1 or isolated biallelic CEBPA mutation and without FLT3-ITD]
- Monosomy 5 or 7
- Treatment-related leukemia
- First relapse
- CR2 and beyond, if not previously evaluated

##### Acute Lymphoblastic Leukemia (ALL) (age <15 years)
- Infant at diagnosis
- Primary induction failure
- Presence of minimal residual disease after initial therapy
- High/very high-risk CR1 including:
  - Philadelphia chromosome positive slow-TKI responders or with IKZF1 deletions; Philadelphia-like
  - iAMP21
  - 11q23 rearrangement
- First relapse
- CR2 and beyond, if not previously evaluated

##### Acute Lymphoblastic Leukemia (ALL) (adolescent and young adults age 15-39 years)

*High-resolution HLA typing is recommended at diagnosis for all patients*

- Primary induction failure
- Presence of minimal residual disease after initial therapy
- High/very high-risk CR1 including:
  - Philadelphia chromosome positive or Philadelphia-like
  - iAMP21
  - 11q23 rearrangement
  - B-cell with poor-risk cytogenetics
- First relapse
- CR2 and beyond, if not previously evaluated

##### Myelodysplastic Syndromes (MDS)
- At diagnosis for all subtypes
### Pediatric Acute Leukemias and Myelodysplasia (continued)

#### Juvenile Myelomonocytic Leukemia (JMML)
- At diagnosis

#### Lymphomas

##### Non-Hodgkin Lymphoma

##### Follicular
- Poor response to initial treatment
- Initial remission duration <24 months
- First relapse
- Transformation to diffuse large B-cell lymphoma

##### Diffuse Large B-Cell
- Primary induction failure, including residual PET avid disease
- First relapse
- CR2 or subsequent remission
- Double or triple hit (MYC and BCL-2 and/or BCL-6) – at diagnosis
- Primary CNS lymphoma at diagnosis

##### High Grade
- C-myc rearrangement at diagnosis
- Primary induction failure
- CR1
  - First relapse
- CR2 or subsequent remission

##### Mantle Cell
- At diagnosis
- First relapse
- Bruton’s tyrosine kinase (BTK) intolerant or resistant disease

##### Mature T-cell
- CR1
  - First relapse

##### Other High-Risk Lymphomas
- At diagnosis

##### Hodgkin Lymphoma
- Primary induction failure
- First relapse
- CR2 or subsequent remission

#### Other Malignant Diseases

##### Germ Cell Tumors
- Poor initial response
- Short initial remission

##### Neuroblastoma
- INSS stage 2 or 3 at diagnosis
  - MYCN amplification (>4x above reference)
- INSS stage 4 at diagnosis
  - MYCN amplification (>4x above reference)
  - age >18 months at diagnosis
  - age 12-18 months with unfavorable characteristics
- Metastatic disease at diagnosis
- Progressive disease while on therapy or relapsed disease
### Other Malignant Diseases (continued)

<table>
<thead>
<tr>
<th>Ewing Family of Tumors</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Metastatic disease at diagnosis</td>
</tr>
<tr>
<td>• First relapse or CR2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medulloblastoma</th>
</tr>
</thead>
<tbody>
<tr>
<td>• First relapse or CR2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Multiple Myeloma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple Myeloma</td>
</tr>
<tr>
<td>• At diagnosis</td>
</tr>
<tr>
<td>• At first progression</td>
</tr>
</tbody>
</table>

### Non-Malignant Disorders

<table>
<thead>
<tr>
<th>Immune Deficiency Diseases (including severe combined immunodeficiency syndromes, Wiskott-Aldrich syndrome, Omenn syndrome, X-linked lymphoproliferative syndrome, severe congenital neutropenia and others)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• At diagnosis or if detected on newborn screening</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inherited Metabolic Disorders (including Hurler syndrome, adrenoleukodystrophy, and others)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• At diagnosis or if detected on newborn screening</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hemoglobinopathies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sickle Cell Disease</td>
</tr>
<tr>
<td>• Children with available matched sibling donor</td>
</tr>
<tr>
<td>• All patients with aggressive course (stroke, end-organ complications, frequent pain crises)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transfusion-Dependent Thalassemias</th>
</tr>
</thead>
<tbody>
<tr>
<td>• At diagnosis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hemophagocytic Lymphohistiocytosis (HLH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• At diagnosis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Severe Aplastic Anemia and Other Marrow Failure Syndromes (including Fanconi anemia, Diamond-Blackfan anemia, Shwachman-Diamond syndrome and others)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• At diagnosis</td>
</tr>
</tbody>
</table>

---

We gratefully acknowledge the support provided by

![SANOFI GENZYME](image)

---

![BeTheMatch Clinical](image)

1 (800) 526-7809 | BeTheMatchClinical.org

©2018 National Marrow Donor Program