Outpatient Management of the Hematopoietic Stem Cell Transplant Patient
Which of the following is not commonly associated with chronic graft-vs-host disease (GVHD)?

A. Lichen planus changes in the skin or oral mucosa **JL647**
B. Diarrhea and abdominal cramping **JL648**
C. Sensory neuropathy and acute renal failure **JL649**
D. Hyperbilirubinemia and transaminitis **JL650**
Pretest Question #2

What infection prophylaxis regimen would you expect a CMV-, multiple myeloma patient post *autologous* stem cell transplantation to be on at day 100?

A. Acyclovir bid, Pen VK bid, Bactrim DS M/T weekly  **JL651**
B. Valganciclovir bid, pentamadine monthly, Diflucan bid  **JL652**
C. Acyclovir bid  **JL653**
D. PenVK bid, Bactrim DS M/W/F, Diflucan daily  **JL654**
Outpatient Management of the Hematopoietic Stem Cell Transplant Patient

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Ali McBride, PharmD, MS, BCPS, BCOP
The University of Arizona Cancer Center
Ms. Kurtin has acted as a consultant for Bristol-Myers Squibb, Celgene, Incyte, Novartis, Onyx, Pharmacyclics, Takeda, and TEVA.

Dr. McBride has nothing to disclose.
Learning Objectives

1. Review the emerging role of maintenance treatment after transplant in both the autologous and allogeneic settings
2. Discuss the role of interdisciplinary management of graft-vs-host disease in the outpatient setting
3. Review the most common infections that occur in the posttransplant setting
Current Trends in Hematopoietic Stem Cell Transplantation (HCT)

- ~ 20,000 HCT procedures performed annually (US)
- Survival: Varies widely by disease state and tempo/control, comorbidities, age, donor source, and caregiver situation
- Timing and intensity of induction regimen vary by disease
- The American Society for Blood and Marrow Transplantation (ASBMT) guidelines:
  - White Paper: Indications for HCT

General Eligibility Criteria

- Clinical factors
  - HCT-CI tool
    - [http://www.hctci.org/](http://www.hctci.org/)
  - Disease stage
  - Previous treatments (chemotherapy/radiation)
  - Infectious disease
  - Transfusion history
  - Performance status
  - In most cases, chronologic age alone should not determine eligibility

General Eligibility Criteria

- Donor eligibility
  - 66%–93% of patients have an available and willing HLA-matched donor at ≥ 7 of 8 loci through the Be The Match Registry®
  - Determined by inherited tissue type (ethnicity)
- Psychosocial evaluation is essential
- Availability of a qualified and available caregiver is prerequisite
- Financial and treatment center criteria

Transplants by Recipient Age by Year

Source: National Marrow Donor Program/Be the Match
**Timing for Referrals Is Crucial**

- The optimal timing for HCT is disease specific
- HCT outcomes can be highly dependent upon transplant timing
- Early referral to a transplant center is perhaps the single most important step that can affect survival
- Recommended timing for transplant consultation guidelines have been developed by the National Marrow Donor Program, Be The Match, and ASBMT
  - 1 (800) 526-7809 | BeTheMatchClinical.org

Recommended Timing for HCT: Acute Myelogenous Leukemia (AML)

- High-resolution HLA typing is recommended at diagnosis for all patients
- Early after initial diagnosis, all AML patients including:
  - CR1, except favorable risk AML [defined as: t(16;16); inv 16; t(8;21); t(15;17); normal cytogenetics with NPM1 or biallelic CEBPA mutation and without FLT3-ITD]
  - Antecedent hematologic disease (e.g., MDS)
  - Treatment-related leukemia
  - Primary induction failure or relapse
  - Presence of minimal residual disease after initial or subsequent therapy
  - CR2 and beyond, if not previously evaluated

Acute Myelogenous Leukemia Overall Survival
Unrelated Transplantation with Bone Marrow for Adult Patients, by Disease Status at Transplant (2003–2012). Transplants facilitated by NMDP/Be The Match

MORTALITY (%)

MONTHS AFTER TRANSPLANT

First complete remission (n=609)
Second complete remission (n=313)
Advanced disease (n=439)

Log-rank p-value < 0.001

Phases and Terminology of Transplantation: Myeloma

After Day 100: The Role of the Oncology Advanced Practitioner

- Collaborative practice is essential to effective management of the patient and their family post-HCT
- Early identification of infection
- Early identification of relapse
- Screening and prevention of late effects
- Graft-vs-host disease (GVHD) co-management
- Psychosocial support: patient and family
- Referrals to appropriate collaborators

International Guidelines for Screening and Prevention of Late Effects

- An international group of transplant experts convened in 2011
- Updated guidelines to reflect change in practice and international applicability
- Guidelines were published in a number of international journals
- NMDP provides access for providers
  - [http://www.marrow.org/md-guidelines](http://www.marrow.org/md-guidelines)

## Sample Screening and Prevention of Late Effects Guideline

<table>
<thead>
<tr>
<th>Tissues/organs</th>
<th>Late complications</th>
<th>General risk factors</th>
<th>Monitoring tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ocular</td>
<td>*Cataracts</td>
<td>*TBI/radiation exposure to head and neck</td>
<td>Ophthalmologic exam</td>
</tr>
<tr>
<td></td>
<td>*Sicca syndrome</td>
<td>*Corticosteroids</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*Microvascular retinopathy</td>
<td>*GVHD</td>
<td></td>
</tr>
<tr>
<td>Oral</td>
<td>*Sicca syndrome</td>
<td>*GVHD</td>
<td>Dental assessment</td>
</tr>
<tr>
<td></td>
<td>*Caries</td>
<td>*TBI/radiation exposure to head and neck</td>
<td></td>
</tr>
</tbody>
</table>
# Sample Screening and Prevention of Late Effects Guideline: Ocular

<table>
<thead>
<tr>
<th>Tissues/ organs</th>
<th>Late complications</th>
<th>Monitoring tests and preventative measures in all HCT recipients</th>
<th>Monitoring tests and preventive measures in special populations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ocular</td>
<td>*Cataracts</td>
<td>*Routine clinical evaluation at 6 mo and 1 yr after HCT and at least yearly thereafter</td>
<td>Patients with cGVHD: Routine clinical evaluation, and if indicated, ophthalmologic exam more frequently</td>
</tr>
<tr>
<td></td>
<td>*Sicca syndrome</td>
<td>*Ophthalmologic exam with measurement of visual acuity and fundus exam at 1 yr after HCT, subsequent evaluation based on findings and risk factors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*Microvascular retinopathy</td>
<td>*Prompt ophthalmologic exam in patients with visual symptoms</td>
<td></td>
</tr>
</tbody>
</table>

## Sample Screening and Prevention of Late Effects Guideline: Ocular

<table>
<thead>
<tr>
<th>Recommended screening prevention</th>
<th>6 mo</th>
<th>12 mo</th>
<th>Annually</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ocular clinical symptom evaluation</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Ocular fundus exam</td>
<td>+</td>
<td>1</td>
<td>+</td>
</tr>
</tbody>
</table>

1 = recommended for all transplant recipients.
2 = recommended for any patient with ongoing chronic GVHD or immunosuppression.
+ = reassessment recommended for abnormal testing in a previous time period or for new signs/symptoms.

### Sample Screening and Prevention of Late Effects Guideline: Immunity

<table>
<thead>
<tr>
<th>Recommended screening prevention</th>
<th>6 mo</th>
<th>12 mo</th>
<th>Annually</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encapsulated organism prophylaxis</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>PCP prophylaxis</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>CMV testing</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Immunizations</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

1 = recommended for all transplant recipients.
2 = recommended for any patient with ongoing chronic GVHD or immunosuppression.
+ = reassessment recommended for abnormal testing in a previous time period or for new signs/symptoms.

Graft-vs-Host Disease

- Acute
  - 20%–80% of allogeneic transplant patients
  - More severe after HCT from HLA non-identical or unrelated donors
  - Most often prior to day 100, but may persist or appear late

- Chronic
  - 30%–70% of allogeneic transplant patients
  - Generally after taper off immunosuppression -> day 100
  - Balance of graft vs. disease effect and debilitating and/or irreversible symptoms

- Early detection of chronic GVHD
  - Prevent irreversible organ damage
  - Improve survival
  - Increase the quality of life of transplant recipients

Chronic Graft-vs-Host Disease (cGVHD)

- cGVHD can affect most all organ systems
- Diagnostic criteria for cGVHD are based on the presence of distinctive symptoms from acute GVHD
- Generally requires a tissue biopsy or other special testing for confirmation
- Graded as mild, moderate, or severe based on the number of organ systems involved
- Requires immunosuppressive therapy and other supportive treatment to prevent irreversible organ damage

Collaboration with the transplant center is recommended

Graft-vs-Host Disease

Most common sites

- **Skin**
  - Poikiloderma, lichen planus, sclerotic features, morphea-like features, depigmentation
  - Referral to dermatologist for skin exam and biopsy

- **GI**
  - Anorexia, nausea, vomiting, diarrhea, weight loss
  - Requires biopsy; refer to gastroenterology

- **Oral**
  - Lichen-type features, hyperkeratotic plaques, restriction of the mouth from sclerosis, gingivitis, mucositis, erythema, pain
  - Refer to dentist
  - Oral rinses with steroids

- **Liver**
  - Total bilirubin, alkaline phosphatase > 2× ULN; ALT or AST > 2× ULN
  - Liver biopsy; may also require referral to hepatology

Mean of 5 Most Severe Symptoms of the MD Anderson Symptom Inventory–Blood and Marrow Transplantation


n = 164
Symptoms Over Time by Transplant Type

International Guidelines for Screening and Prevention of Late Effects

NMDP patient and caregiver version with mobile app

- [http://www.BeTheMatch.org/Patient](http://www.BeTheMatch.org/Patient)

- Access 6-month, 12-month and 2+ year annual checkup guidelines: anytime, anywhere
- Generate a list of tests and evaluations customized to your unique situation
- E-mail information to yourself or your health care team
- Mobile app: iPhone®, iPad®, Android™, mobile web
Outpatient Management of the BMT Patient

Ali McBride, PharmD, MS, BCPS, BCOP
The University of Arizona Cancer Center
Hematopoietic stem cell transplantation (HSCT) is an increasingly common procedure.

Preparative regimens impose a state of combined immunodeficiency through impairment of host defenses.

B-cell and T-cell immunity
- Reconstitution after HSCT resembles the development of immunity in normal infant
- Delayed by the presence and/or treatment of GVHD
Background

**Autologous Transplant**

**Allogeneic Transplant**

[Diagram of Autologous Transplant]

[Diagram of Allogeneic Transplant]

biomed.brown.edu
Background

- Loss of antibody titers to vaccine preventable diseases during the first 4 years following HSCT has been documented.
- Vaccine preventable diseases do occur in HSCT patients, most commonly:
  - Streptococcus pneumoniae
  - \textit{Haemophilus influenzae} type b
  - Influenza A
  - Varicella zoster
- Successful vaccination causes the development of:
  - High-affinity antibodies which neutralize a specific pathogen
  - High concentration of memory effector T cells
Background

- 0-30 days following HSCT
  - Neutrophil recovery
  - Phagocytic function

- 6 months following HSCT
  - “Humoral immunity”
  - Immune globulin levels normalize

- 12 months following HSCT
  - “Cellular immunity”
Phases of Immune Suppression and Associated Opportunistic Infections

# Current Vaccine Titer Schedule

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>≥6 mo</th>
<th>≥8 mo</th>
<th>≥10 mo</th>
<th>≥12 mo</th>
<th>≥14 mo</th>
<th>≥16 mo</th>
<th>≥18 mo</th>
<th>≥24 mo</th>
<th>≥60 mo</th>
<th>Min Int</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenzae (inactivated) (Sept–March)</td>
<td>Flu</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H. influenzae type B</td>
<td>HiB</td>
<td>HiB</td>
<td>HiB</td>
<td>Titers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1-2 mo</td>
</tr>
<tr>
<td>Meningococcal (Menactra, Menveo, MCV4)</td>
<td>MCV4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal-conjugate (Prevnar 13)</td>
<td>PCV13</td>
<td>PCV13</td>
<td>PCV13</td>
<td>Titers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1-2 mo</td>
</tr>
<tr>
<td>Pneumococcal-polysaccharide (Pneumovax2b)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PCV13</td>
<td>Pneumovax</td>
<td>Titers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polio (inactivated)</td>
<td>IPV</td>
<td>IPV</td>
<td>IPV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>HAV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>HAV</td>
<td></td>
<td></td>
<td>6 mo</td>
</tr>
<tr>
<td>Hepatitis B4</td>
<td>HBV</td>
<td>HBV</td>
<td>HBV</td>
<td>Titers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 mo</td>
</tr>
<tr>
<td>HPV (Gardasil), 9-26 years</td>
<td>HPV</td>
<td>HPV</td>
<td>HPV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 mo after 1st; 4 mo after 2nd dose</td>
</tr>
<tr>
<td>Acellular Pertussis-Tetanus-Diphtheria4</td>
<td>Tdap</td>
<td>Td</td>
<td>Td</td>
<td>Titers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1-2 m</td>
</tr>
</tbody>
</table>

[Link to document](https://www.fredhutch.org/content/dam/public/Treatment-Support/Long-Term-Follow-Up/physician.pdf)
Tetanus

- Successful immunization achieved with 3 doses of vaccine regardless of GVHD status
  - More than 1 dose must be given to achieve lasting IgG levels
  - Vaccination should start 6-12 months post-HSCT

- Tetanus
  - Response rates of vaccination
  - Decrease in mean concentration of antibodies based on time of vaccination
    - Vaccine at 6 months ~90% immunity
    - Vaccine at 18 months ~70% immunity

- In late group recipients, antibody response after 1st and 2nd dose correlated with antibody levels of donors

Diphtheria

- Loss of antibodies after HSCT
- Only 50% of patients retained levels after transplant
- Multiple doses more effective than single dose
- Demonstrated in allo HSCT without GVHD
- Effects of cGVHD on response

Haemophilus Influenza Type b

- Important cause of infection
  - Early 1980s French group reported it as a leading cause of morbidity and mortality and main cause of pneumonia > 90 days post-HSCT
  - Recent reports are lacking

- Timing appears to be important
  - Early immunization (3–6 months) produced higher levels of antibody titers vs. late vaccination (12 months), yet efficacy similar
  - Donor vaccination improved responses in recipients

- Two doses produced 80% immunity
  - Might be improved by giving a dose before stem cell harvest
  - Start 6–12 months after HSCT with 3 doses

Pneumococcus

- EBMT Survey (July 1994–Dec 1997)
  - Increased incidence in allo vs auto
  - 12.2/1000 vs 4.6/1000 ($p < .001$)
- Increased risk of invasive infection in patients with cGVHD vs no cGVHD
  - 18.85/1000 vs 8.25/1000 ($p = .015$)
  - Functional hyposplenism
- Decreased IgG and antigenicity

Pneumococcus (cont)

- Less immunogenic vaccine in HSCT patients compared to other vaccines
  - Polysaccharide vs. conjugate
  - Immune responses
- Improvement with multiple doses?
- Vaccination should occur at 12 months for all patients (2nd dose “boost”)
  - Conjugate vaccine for young children (less than 7 years old) and patients with cGVHD
  - Can consider subsequent polysaccharide dose
- Antibiotic prophylaxis should occur in patients with cGVHD
  - Testing of immunity every 2-3 yr in patients with cGVHD

The Others

- Polio
  - Schedules of immunization

- Measles, Mumps, Rubella
  - Measles
    - Severe and fatal
  - Mumps
    - Routine use not recommended but it is included in vaccine with measles and rubella
  - Rubella
    - Low risk of development

- Influenza
  - Response relative to dose timing
  - Inactivated influenza not effective when given within first 6 months after HSCT

Phases of Opportunistic Infections Among Allogeneic HCT Recipients

Neutropenic Phase

- During this period (2-4 wk), the patient essentially has no effective immune system
- Healing is poor, and the patient is very susceptible to infection
- Supportive care and empiric antibiotic therapy are the mainstays of successful passage through this phase
During this period (several weeks), the healing process begins with resolution of mucositis and other lesions acquired:
  - Fever begins to subside
  - Infections often begin to clear

The greatest challenges at this time are management of GVHD and prevention of viral infections (especially CMV):
  - Monitoring during and after immunosuppression for allogeneic patients for CMV usually occurs on a weekly basis
    - CMV PCR is used
    - Some institutions may use prophylaxis depending on the protocol
Post-engraftment Phase

- This period lasts for months to years
- Hallmarks of this phase include:
  - Gradual development of tolerance
  - Weaning off of immunosuppression
  - Management of chronic GVHD
  - Documentation of immune reconstitution
# Transplant Prophylaxis

<table>
<thead>
<tr>
<th>Transplant Type</th>
<th>HSV</th>
<th>CMV</th>
<th>PJP</th>
<th>Antifungal</th>
<th>Encapsulated bacteria&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autologous</td>
<td>Acyclovir 800 mg bid</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Allogeneic</td>
<td>Acyclovir 800 mg bid</td>
<td>PCR levels weekly</td>
<td>IV pentamadine; then Bactrim twice a week*</td>
<td>Fluconazole 200 mg daily</td>
<td>Pen VK 750 mg bid</td>
</tr>
</tbody>
</table>

<sup>a</sup>Only in patients with GVHD (\textit{Streptococcus pneumoniae}, \textit{Haemophilus influenzae}, and \textit{Neisseria meningitidis}).

<sup>b</sup>Bactrim is preferred if \textit{Toxoplasma gondii} positive.

[https://www.fredhutch.org/content/dam/public/Treatment-Support/Long-Term-Follow-Up/physician.pdf](https://www.fredhutch.org/content/dam/public/Treatment-Support/Long-Term-Follow-Up/physician.pdf)
Maintenance Regimens: Autologous Transplant

Myeloma
- Bortezomib
- Thalidomide
- Lenalidomide

Lymphoma
- Brentuximab
Why Maintenance Therapy?

- Induction therapy followed by autologous SCT alone will cytoreduce but not cure most patients
- Can maintenance therapy:
  - Prevent or delay disease progression?
  - Convert partial responses to complete responses?
  - Improve overall survival?
- Problems with maintenance therapy
  - Everybody gets the drug, not everybody gets the benefit
  - You “burn” an effective drug
  - Treatment fatigue
- What defines an ideal maintenance strategy?
  - Significantly improved outcomes with minimal side effects and preservation of response to salvage
Maintenance Therapy in Transplant

- Maintain response achieved following a new treatment with administration of drugs for a prolonged time period
- Therapy must be
  - Convenient
  - Safe and well tolerated LONG TERM
  - NOT prevent use or reduce efficacy of other future treatments
- Must be affordable
Maintenance Therapy: Philosophical Perspective

**Pros**
- Increases remission duration
- Maintains minimal disease burden preventing end organ damage
- Targets “tumor cells” that leave “dormancy phase”
- May further decrease tumor burden post-primary therapy

**Cons**
- Exposes all patients to the side effects of prolonged treatment
- Can result in resistant clones
- Late effects of long-term therapy
- Cost

Common wisdom dictates that PFS by itself may not justify continuous therapy for all patients with a specific disease. Either a survival or QOL benefit needs to be garnered when comparing continuous therapy to therapy upon progression. The question is made even more difficult if the issue of preemptive (i.e., early intervention) is included.
## Thalidomide: Maintenance Therapy After Autologous Stem Cell Transplant

<table>
<thead>
<tr>
<th>N</th>
<th>Initial dose, mg/d</th>
<th>Maintenance vs no maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CR, %</td>
</tr>
<tr>
<td>Attal et al.(^1)</td>
<td>597</td>
<td>400 w/ PAM vs PAM or none</td>
</tr>
<tr>
<td>Barlogie et al.(^2)</td>
<td>668</td>
<td>400</td>
</tr>
<tr>
<td>Spencer et al.(^3)</td>
<td>243</td>
<td>200 w/ steroid vs steroid alone</td>
</tr>
<tr>
<td>Lokhorst et al.(^4)</td>
<td>535</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*CR + VGPR rates

---

Melphalan/Prednisone/Lenalidomide (MPR) vs MEL200/ASCT Following Lenalidomide/Dexamethasone Induction

Consolidation

N = 402 <65 yr

- **MPR (n = 202)**
  - Melphalan: 0.18 mg/kg/d, days 1–4
  - Prednisone: 2 mg/kg/d, days 1–4
  - Lenalidomide: 10 mg/d, days 1–21 q 28 days ×6

- **Tandem MEL200 / ASCT**
  - Stem cells mobilized with cyclophosphamide + G-CSF

Primary end point: PFS

Progression-Free Survival

49.4% Reduced Risk of Progression

Median follow-up: 26 months

<table>
<thead>
<tr>
<th>Treatment</th>
<th>2-yr PFS</th>
<th>Median PFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEL200</td>
<td>73%</td>
<td>Not reached</td>
</tr>
<tr>
<td>MPR</td>
<td>54%</td>
<td>25.26 mo</td>
</tr>
</tbody>
</table>

HR 0.506

*p = .0002

MPR = melphalan-prednisone-lenalidomide; MEL200 = melphalan 200 mg/m²; PFS = progression-free survival; HR = hazard ratio.

CTN 0702 Trial

BMT CTN 0702: SCHEMA

- Register and Randomize
- MEL 200mg/m²
- VRD x 4*
- Lenalidomide Maintenance
- Lenalidomide Maintenance**
- MEL 200mg/m²

- Bortezomib 1.3mg /m² days 1, 4, 8, 11
- Lenalidomide 15mg days 1-15
- Dexamethasone 40mg days 1,

**Lenalidomide 15 mg daily x 3 years

https://clinicaltrials.gov/ct2/show/NCT01109004
Brentuximab Maintenance

- Autologous stem cell transplant (ASCT) in patients with relapsed or refractory Hodgkin lymphoma (HL) can achieve cure in approximately 50% of patients
- Over the past 20 years, no improvement has been shown in efficacy outcomes from randomized trials of ASCT regimens for aggressive lymphomas (HL or diffuse large B-cell lymphoma)
- Brentuximab vedotin is a CD30-directed therapy that has shown efficacy in patients with HL who relapsed or were refractory after prior ASCT
- Consolidation could prevent disease progression post-ASCT in patients at risk for relapse or progression
- Evaluated PFS, OS, safety, and efficacy

The Athera Trial

Outcomes and Side Effects

Outcomes

- PFS by independent review was significantly improved in patients in the brentuximab vedotin group (HR 0.57, 95% CI, 0.40–0.81; p = .0013)
- Median PFS by independent review was 42.9 mo (95% CI, 30.4–42.9 mo) for patients in the brentuximab vedotin group vs 24.1 mo (11.5 mo–not estimable) for those in the placebo group
- At time of analysis, 28 (17%) of 167 patients in the brentuximab vedotin group had died, compared with 25 (16%) of 160 patients in the placebo group

Side Effects

The most frequent adverse events in the brentuximab vedotin group were:

- Peripheral sensory neuropathy
  - 94 [56%] of 167 brentuximab vs
  - 25 [16%] of 160 placebo
- Neutropenia
  - 58 [35%] brentuximab vs
  - 19 [12%] placebo

HR = hazard ratio; CI = confidence interval; PFS = progression-free survival.
Summary

- Evaluation of vaccines is essential in the post-transplant patient, with active review of current administration based on patient’s transplant history and titer levels.
- Antibiotic prophylaxis and monitoring of CMV in the autologous transplant is essential, as a lack of one of the antibiotics could lead to increased infection.
- Post-transplant maintenance can occur in different types of autologous transplant to improve outcomes for long-term survival; understanding the treatment and dosing as well as side effects is pivotal for patient compliance.
References


Posttest Question #1

Which of the following is *not* commonly associated with chronic graft-vs-host disease (GVHD)?

A. Lichen planus changes in the skin or oral mucosa
   JL655
B. Diarrhea and abdominal cramping
   JL656
C. Sensory neuropathy and acute renal failure
   JL657
D. Hyperbilirubinemia and transaminitis
   JL658
Posttest Question #2

What infection prophylaxis regimen would you expect a CMV-, multiple myeloma patient post *autologous* stem cell transplantation to be on at day 100?

A. Acyclovir bid, Pen VK bid, Bactrim DS M/T weekly  
B. Valganciclovir bid, pentamadine monthly, Diflucan bid  
C. Acyclovir bid  
D. PenVK bid, Bactrim DS M/W/F, Diflucan daily