

# Journey of a Patient With Multiple Myeloma Undergoing Autologous Stem Cell Transplantation

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Multiple myeloma accounts for 10% of all hematologic malignancies. It has been drawn to the forefront of clinical interest because of recent advances in treatment regimens. Although there are multiple lines of available therapies and ongoing clinical trials, autologous stem cell transplantation remains the central option for prolonging durations of remission and improving overall survival. This case study demonstrates how oncology nurses play a critical role in patients' journeys before and after autologous stem cell transplantation.

## AT A GLANCE

- Oncology nurses must emphasize patient education regarding side effect reporting and management.
- Keep abreast of prophylactic medications to prevent bacterial and fungal infections.
- Remember the importance of counseling and mindfulness intervention to support patients' psychosocial health.

## KEYWORDS

multiple myeloma; autologous stem cell transplantation; oral mucositis

## DIGITAL OBJECT IDENTIFIER

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Allogeneic and autologous stem cell transplantations were introduced in the 1990s as treatments for multiple myeloma (MM). Autologous stem cell transplantation (ASCT) remains the standard of care for young patients with newly diagnosed MM (Al Hamed et al., 2019). In general, ASCT is reserved for patients aged younger than 65 years with no significant comorbidities. However, patients aged younger than 75 years are often considered for ASCT if they are healthy and exhibit an excellent performance status (Siegel et al., 2021).

Mobilization of hematopoietic stem cells from the bone marrow to the peripheral blood is crucial for transplantation. The minimum CD34<sup>+</sup> stem cell dose considered to be sufficient for successful engraftment is  $2 \times 10^6$  CD34<sup>+</sup> cells/kg, with an optimal target of  $5 \times 10^6$  CD34<sup>+</sup> cells/kg. The use of granulocyte-colony-stimulating factor (G-CSF) and plerixafor may increase the production of stem cells. Plerixafor is a chemokine receptor 4 antagonist that enhances the stem cell mobilization effect of G-CSF (Mohty et al., 2011).

## Case Study of Autologous Stem Cell Transplantation

A patient-focused, interprofessional team accompanies patients on the journey through ASCT. Oncology bone marrow transplantation nurses are vital members of the team and are integral to patient assessment, intervention, and education. Outpatient ASCT can be safely performed for select patients with MM. Table 1 outlines common complications of ASCT and the associated nursing interventions.

M.J. is a 62-year-old female who experienced rib pain, which was initially believed to be related to osteoporosis. Her calcium was 11.8 mg/dL. A computed tomography scan revealed lytic lesions throughout the spine. A workup for MM was initiated, and results confirmed the diagnosis. Induction chemotherapy included lenalidomide, bortezomib, and dexamethasone. A complete response was achieved after four cycles. The patient was evaluated for ASCT to increase length of remission and prolong overall survival. M.J. started her journey one week after peripheral stem cell collection.

## The Day Before Transplantation

The day before undergoing ASCT, M.J. received standard high-dose melphalan, an alkylating agent. Common side effects are severe bone marrow