The role of nurses as quality managers in bone marrow transplantation programmes

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ABSTRACT

Bone marrow transplantation (BMT), also known as haematopoietic cell transplantation (HCT), is a well-established therapeutic option for patients suffering from haematological malignancies,...

Bone marrow transplantation (BMT), also known as haematopoietic cell transplantation (HCT), is a well-established therapeutic option for patients suffering from haematological malignancies, immune disorders and other serious diseases. The procedure involves the harvesting of haematopoietic stem cells from bone marrow or peripheral blood, followed by their infusion into the same patient (autologous transplant) or into a different recipient (allogeneic transplant).

Due to its complexity and associated risks, this type of transplantation requires high coordination, strict infection prevention measures, continuous patient monitoring and constant quality improvement processes. Nurses play a central role in bone marrow transplantation programmes, providing specialised care and contributing to quality management at all stages of the transplantation process.

Their responsibilities are to ensure that the transplantation process is carried out in a coordinated manner.

Their responsibilities include infection control, regulatory compliance, staff training, performance improvement, patient and family education, and interdisciplinary collaboration. Their clinical expertise and commitment to quality standards are critical to optimising clinical outcomes, ensuring safety and maintaining compliance with regulatory and accreditation requirements.

This article explores the role of nurses as quality managers in bone marrow transplantation programmes, highlighting their contribution to patient safety, infection prevention, monitoring of quality indicators, management of adverse events, staff training and use of technology to support continuous improvement.

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Providing patient safety and infection control

Nurses play a crucial role in infection control, especially in haematopoietic stem cell transplantation programmes, given the profound immunosuppression of patients. Transplant recipients are extremely vulnerable to infections, which can cause serious and life-threatening complications. Infections are still a major cause of morbidity and mortality, particularly in allogeneic transplants.

&It is therefore essential to have an adequately trained nursing team to assess, prevent, detect and manage infections throughout the transplantation process. The immunosuppressive effects of chemotherapy and radiotherapy further increase the patient's vulnerability.

Nurses involved in quality management are responsible for ensuring strict adherence to infection control protocols. These include strict hand hygiene practices and the correct use of personal protective equipment (PPE) by staff and visitors.

The nurses involved in quality management are responsible for ensuring that infection control protocols are strictly adhered to.

In addition, nurses develop and implement specific protocols to reduce the incidence of central venous catheter-associated bloodstream infections, conduct regular surveillance of nosocomial infections and design targeted strategies to prevent them in transplant patients. Other preventive measures include the use of positive pressure isolation rooms with HEPA filters for immunocompromised patients, in particular to protect against airborne fungal infections such as Aspergillosis.

Basic prevention and control measures also include respiratory hygiene, safe handling of healthcare equipment, environmental cleanliness, handling of laundry, handling of blood or body fluid spills, waste disposal and exposure management. Among these, hand hygiene remains an essential component of standard precautions for all patients.

Monitoring of quality indicators and performance improvement

Data-driven decision making is essential for improving transplant outcomes. Nurses with responsibility for quality management contribute significantly to the development and monitoring of key performance indicators (KPIs), which support the continuous evaluation of

BMT programme effectiveness. These indicators include:

- Infection rates
- Successful engraftment (time required for transplanted cells to start functioning)
- .
- Readmission rates and patient follow-up
- .
- Post-transplant mortality and quality of life of the patient
- Patient satisfaction levels

The analysis of these data allows nurses to identify trends, monitor clinical performance and implement targeted interventions to improve clinical outcomes and programme efficiency.

A study published in *Haematologica* showed that accredited quality improvement programmes can significantly reduce transplant-related complications, with an overall improvement of between 10% and 15%.

Guaranteeing compliance with regulatory and accreditation standards

BMT programmes must comply with rigorous standards set by regulatory and accreditation bodies. Policies and procedures must be aligned with the **FACT-JACIE International Standards for Cellular Therapy**, jointly developed by the Foundation for the Accreditation of Cellular Therapy (FACT) and the ISCT-Europe & EBMT Joint Accreditation Committee (JACIE). In addition, the programmes must comply with general hospital accreditation requirements, such as those established by The Joint Commission (JCI).

Nurses play a key role in ensuring compliance with these standards by conducting internal audits, maintaining accurate documentation and leading staff training sessions. FACT-JACIE accredited programmes show increased adherence to good practice, resulting in improvements in transplant success rates and patient safety.

Adverse event reporting and management

Nurse quality managers are responsible for reporting and investigating adverse events and near misses in order to enhance patient safety. All relevant events must be documented in quality management reports and shared with the relevant teams, including clinical, collection and

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processing teams. A structured audit process supports the identification of root causes and ensures that corrective and preventive measures are implemented effectively to reduce the risk of recurrence.

Training, Updating and Skills Development

Continuing education and skills development are essential to ensure high quality care in BMT programmes. Nurses in quality coordination roles manage training initiatives, including the creation of structured programmes, staff orientation, mentoring models and both basic and specialised training courses. In addition, they conduct mandatory competency assessments and organise workshops on infection control, emergency protocols and transplant complications.

Patient and family education

Adherence to post-transplant care guidelines by patients and relatives is critical for long-term success. Quality assurance nurses develop educational programmes to improve understanding of infection prevention measures, therapeutic adherence and early recognition of complications such as **graft-versus-host disease (GVHD)**.

They also train patients, family members and visitors on proper hand hygiene practices and provide clear instructions to reduce infectious risk.

Promoting interdisciplinary collaboration

Bone marrow transplantation requires effective collaboration between healthcare professionals from different disciplines. Regular interdisciplinary meetings promote coordinated care, reduce clinical errors and improve the overall efficiency of programmes.

Evidence shows that teamwork contributes to shorter hospital stays and improved clinical outcomes.

Using technology for quality improvement

Modern BMT programmes increasingly adopt digital tools and artificial intelligence to support patient care and safety. Nurses with quality functions oversee the implementation of electronic medical records, telemedicine systems and AI-based infection surveillance technologies.

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These nurses are also supervising the implementation of electronic medical records, telemedicine systems and AI-based infection surveillance technologies.

According to a study published in *Transplantation and Cellular Therapy*, infection monitoring using artificial intelligence reduced mortality from sepsis by 30%.

Conclusion

Nurses in quality management roles are essential to the success of bone marrow transplantation programmes. Their expertise in patient safety, regulatory compliance, performance improvement and staff training ensures high quality, person-centred care.

These nurses are the key to the success of bone marrow transplantation programmes.

As BMT programmes evolve, nurses will continue to drive innovation and continuous improvement, contributing to improved clinical outcomes and the maintenance of high standards in this highly specialised field.

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