

Nurse TAVI Coordinator: Clinical Insights, Competence Management, and Future Directions

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Abstract

Severe aortic stenosis is an increasingly prevalent valvular condition due to population aging, associated with debilitating symptoms and high mortality when left untreated. Transcatheter aortic valve implantation (TAVI) has revolutionized the management of aortic valve disease by providing a minimally invasive alternative that reduces hospital stays and enhances clinical outcomes. In this context, the TAVI Nurse Coordinator plays a crucial role in overseeing the entire patient care pathway. This includes conducting comprehensive frailty assessments and educating both patients and caregivers during the preoperative phase, as well as managing postprocedural follow-up—ensuring seamless multidisciplinary coordination and personalized patient care.

Keywords: Aortic stenosis, Transcatheter Aortic Valve Replacement, Advanced Practice Nursing, TAVI Nurse, Tavi Coordinator, Nurse Practitioner

Introduction

Severe aortic stenosis (AS) is the most common valvular disease in developed countries, with an increasing incidence due to the aging of the population. Its prevalence among individuals over 65 years of age ranges from 2.5% to 7%¹. Although patients may remain asymptomatic for years, the disease progresses inexorably. In its advanced stages, it leads to dyspnea, angina and syncope, along with an increased risk of heart failure and high mortality if untreated². Once symptoms develop, the survival rate drops dramatically to just 2- to 4-years, with mortality reaching up to 50% without treatment³. The therapeutic management of aortic stenosis (AS) is determined by each patient's risk profile and includes three key options.⁴ Medical therapy helps control symptoms but does not alter the disease's progression. Surgical aortic valve replacement (SAVR) remains the gold standard for low-risk patients, while transcatheter aortic valve implantation (TAVI) has revolutionized treatment for the 30–40% of patients deemed unsuitable for surgery due to comorbidities, frailty, or high surgical risk, offering a minimally invasive alternative⁵. TAVI significantly reduces hospital stay, minimizes the use of healthcare resources and optimizes clinical outcomes without increasing complications compared to SAVR. Furthermore, its reduced surgical impact allows safe discharge after an uncomplicated hospital stay, allowing patients to fully benefit from it in terms of survival and quality of life⁵. However, a seamless continuum of care, from pre-procedural to long-term follow-up, is essential⁶. Accordingly, Lean approaches to healthcare organization adopt best practices that improve efficiency, enhance safety in TAVI pathways, reduce waiting times and healthcare costs, and strengthen multidisciplinary collaboration in all phases of care⁷. This integrated vision aims to maximize benefits through accelerated discharge, improved quality of life, and increased patient safety⁷. This synergy promotes robust outcomes for TAVI recipients, reinforcing the importance of streamlined processes and holistic multidisciplinary collaboration⁸.

TAVI Nurse Coordinator: Competence management

The increasing adoption of TAVI requires the establishment of dedicated multidisciplinary programs to ensure appropriate patient selection, risk assessment, procedure planning and post-

procedural management⁸. The establishment of these specialized teams, commonly known as the Heart Team (HT) or TAVI Team (TT), has been instrumental in addressing organizational challenges and enhancing clinical outcomes. Within this framework, the TAVI Nurse Coordinator (TC) has emerged as a pivotal figure, significantly contributing to organizational efficiency, quality of care, and patient satisfaction⁹. Experience from various international centers reveals that advanced practice nurses with expertise in case management, including geriatric assessment, patient education and early discharge planning, can reduce readmission rates and improve subjective health perception¹⁰.

The role of the TC integrates clinical, organizational and educational skills, acting as a link between multiple specialists involved in decision-making and therapy¹¹. This expanded role goes beyond traditional nursing responsibilities to encompass care coordination, preoperative optimization, and comprehensive postoperative follow-up. As a result, the implementation of the TAVI Nurse Coordinator (TC) has been linked to greater procedural efficiency, enhanced patient experience, and improved clinical outcomes. Additionally, the TC provides seamless oversight throughout the entire care continuum—from initial referral to postprocedural follow-up—ensuring effective communication, continuous support within the team, and strong engagement with patients and caregivers⁸. The primary responsibilities include (Figure 1):

1. Care Pathway Management

The TC is responsible for monitoring and coordinating the waiting list, scheduling diagnostic tests, and facilitating specialist consultations. This ensures an optimal workflow, reduces wait times, and improves both the efficiency and appropriateness of interventions.

2. Clinical and Functional Assessment

Meticulous patient selection is critical for the success of any TAVI programme. In collaboration with the HT, the TC conducts a thorough pre-procedural screening, which includes medical history collection, physical assessment, and risk factor analysis. This process also involves frailty evaluation using tools that assess activities of daily living (ADL) and instrumental activities of daily living (IADL), along with strength, mobility, and nutritional status assessments. This comprehensive evaluation enables a more accurate functional prognosis and guides the development of a

personalized rehabilitation plan. In addition, the TC coordinates specialist consultations (eg, radiology, vascular team) to refine both the multidimensional assessment and the care plan.

3. Active participation in the Heart Team

The TC participates in the HT meetings, contributing to patient selection and the ongoing review of clinical protocols. Their nursing experience provides an essential perspective on care needs, particularly for older adults or those with complex comorbidities.

4. Intraoperative Support

During the procedure in the cardiac catheterization laboratory the TC facilitates communication between various professionals, promoting efficient organization. The TC is also trained and authorized to perform valve crimping on the catheter, ensuring correct device preparation prior to implantation.

5. Development and optimization of care protocols

In collaboration with other team members, the TC contributes to the definition and updating of clinical and care protocols, promoting standardized practices to improve quality and safety. A key aspect involves the incorporation of tools to monitor both clinical and process outcomes.

6. Patient and caregiver education

Providing clear information about the benefits and potential risks of TAVI is essential to set realistic expectations and outline postoperative management. This educational support promotes adherence to treatment and a better understanding of the care pathway, reducing the likelihood of complications and facilitating a smoother transition back home. Preoperative education has proven to be particularly beneficial, enriched by structured informational materials (brochures, videos, multimedia resources) and dedicated counselling sessions for caregivers.

Figure 1. The role and responsibilities of Tavi Nurse Coordinator



The TAVI Nurse Coordinator Clinical Insights

The HT is a globally adopted multidisciplinary model for managing patients with severe aortic stenosis undergoing TAVI. Within this structure, the TC plays a central role in ensuring seamless care from initial assessment to post-discharge follow-up. Beyond managing diagnostic tests and multidisciplinary consultations, the TC leverages telemedicine for remote follow-ups, benefiting patients with limited access to hospital services. Through remote monitoring, vital signs can be tracked, treatment adherence assessed, and early signs of clinical deterioration promptly identified, reducing the risk of rehospitalization. In this capacity, the TC not only fulfills operational duties but also takes on a leadership role in patient management, coordinating resources, professionals, and care pathways to ensure a personalized, evidence-based approach.

Taking care of patient

The initial phase of the care process occurs in the TAVI outpatient clinic. Here, the TC collaborates closely with the interventional cardiology physician and other members of the HT to perform a comprehensive initial assessment. The care pathway begins by collecting the patient's medical history and evaluating frailty, quality of life and self-care capacities¹². These instruments help define an individualized care plan that accounts for each patient's unique needs and baseline conditions of each patient. From the very first outpatient visit, the TC initiates discharge planning by coordinating home support and engaging caregivers to facilitate safe and timely return home. This strategy, aligned with the new core curriculum, enables the early identification of potential social and health challenges, thereby minimizing readmission risk¹¹. A central objective is also to organise all required diagnostic tests and multidisciplinary consultations prior to hospital admission, ensuring that each step is carried out efficiently and in a coordinated manner. In addition, the TC manages the waiting list and clinical triage, working with cardiology case managers and family and community nurses (IFEC) to promote seamless integration between hospital and community settings.

• Intraoperative Phase

During this stage, the TC assumes an active role not only in organizational oversight but also in direct patient care. Their participation in the

preprocedural briefing with the HT is pivotal for outlining operational details and ensuring that all aspects of the procedure are meticulously planned. The TAVI nurse typically has advanced expertise in interventional cardiology and operating room procedures and in some centres is authorized to perform valve crimping, reflecting a high degree of specialization. Furthermore, the TC closely monitors any intraprocedural complications and ensures the strict adherence to safety protocols to optimize procedural outcomes.

• Postoperative Phase

The postoperative period is critical to ensure optimal patient recovery and prevent complications. After the procedure, the patient is monitored in the post-acute care unit for two hours before transfer to the ward. Here, the TC oversees continuous clinical monitoring and coordinates early mobilization, focusing on arrhythmia detection and control of bleeding at femoral closure sites during the first two hours. Structured monitoring in these initial hours allows for early detection of the so-called "Big 5" complications, which require rapid identification and management⁷. These early complications include stroke, signaled by neurological changes such as facial asymmetry, speech difficulties, unilateral weakness; paravalvular leak, resulting from suboptimal valve positioning or calcifications and manifesting as hemodynamic changes; and acute kidney injury, related to contrast agents and pre-existing kidney disease. Conduction blocks occur frequently, given the proximity of the aortic valve to the cardiac conduction system, resulting in atrioventricular or bundle branch block; careful ECG monitoring is essential. In addition, bleeding at the vascular access site, especially femoral, complicates early mobilization unless a hematoma or haemorrhage is present. Therefore, the TC applies shared protocols for the rapid identification and treatment of each critical situation, coordinating medical interventions and providing precise information to patients and healthcare professionals, thus improving prognosis and accelerating recovery.

• Early mobilization promotion

Early mobilization represents one of the pillars of the TAVI pathway aimed at a rapid and safe discharge. The use of light sedation or local anaesthesia, combined with minimizing invasive lines, promotes rapid physical reconditioning immediately after the procedure¹³. In particular, TC plays a key role: first, coordinating the multidisciplinary team to assess patient clinical status and define the time of post-procedural mobilization. Subsequently, the TC

collaborates with nursing staff and physical therapists to initiate a gradual exercise protocol: initially, the patient is seated 30–45 degrees within 2 hours after the procedure.

Then a gradual transition to sitting on the edge of the bed is encouraged within 4 hours after the procedure, accompanied by continuous monitoring of stability, pain, and effort tolerance. Once these conditions are verified, active lower-limb exercises are introduced and, if well tolerated, assisted standing is performed within 6 hours, paying particular attention to hemodynamic and arrhythmic parameters. Finally, the patient is encouraged to walk short distances, gradually increasing ambulation based on clinical response. The goal of this strategy is to minimize risks associated with immobilization (such as deep vein thrombosis, decreased perfusion, and loss of muscle mass), while simultaneously promoting faster functional recovery¹². This process is supported by standardized checklists and continuous monitoring of vital signs. Due to this approach, many centres have documented a reduction in length of stay, reducing the costs of hospitalization and an increase in patient satisfaction, given smoother recovery and improved return to daily activities.

- **The Follow-Up**

In this phase, the TC also plays a leadership role in managing the continuity of care, actively collaborating with IFEC and other healthcare professionals to plan a safe and effective discharge. Evaluating socio-family support is essential to arrange a protected discharge plan that may include, if necessary, the participation of caregivers. The patient's path does not end with discharge but continues through a structured follow-up, including nursing consultations at one, three and six months, and up to one year post-procedure¹⁴. The TC is responsible for monitoring patient quality of life and therapeutic adherence, taking immediate action in case of clinical deterioration by consulting the HT. Furthermore, by using validated tools to measure changes in quality of life and improvements following the intervention to contribute to early identification of care and clinical evaluations. Through the use of tele-nursing and tele-rehabilitation programmes, it is possible to ensure effective remote monitoring, reducing the risk of rehospitalization, and optimizing the personalized care pathway.

Future Direction

The future directions of the role of nurse TC are focused on improving patient outcomes, improving interdisciplinary cooperation and embracing technological advances¹⁵. As TAVI continues to develop, nurse TAVI coordinators will play an important role in managing complex patient care pathways, ensuring timely assessments, and facilitating individualized training for patients involved in the procedure⁶. As digital tools and telemedicine are increasingly used, nurses and TC need to adapt through virtual consultation, remote monitoring, and data management¹⁶. In addition, greater emphasis will be placed on the management of competences, where continuing education, certification and interprofessional training will be essential in order to maintain high standards of care. Nurses in this role will also advocate patient-centered care to ensure that patients receive complete support before, during and after the procedure. In the future, leadership and strategic planning will likely be more focused as part of the multidisciplinary efforts of the TAVI programmes¹⁷.

Conclusions

Integration of the TC with other healthcare professionals is a key factor in ensuring the quality and effectiveness of care. Nursing leadership in this context goes beyond operational coordination and extends to the ability to drive continuous innovation and improvement. Advanced clinical competencies with effective organisational and relational management makes it possible to improve the effectiveness of the care pathway, ensuring personalized care based on the best available practices. For this reason, nursing leadership is essential to foster a Lean-orientated approach that, when applied to nursing care, optimizes resources, reduces length of stay, and improves clinical outcomes. Coordination with family and community nurses, along with the adoption of telemedicine tools, promotes continuity of care and proactive follow-up, thus significantly contributing to improving patient quality of life. In a constantly evolving healthcare setting, the TC emerges as a fundamental point of reference, capable of combining innovation, efficiency, and patient-centredness in a highly specialized care pathway.

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