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ORIGINAL RESEARCH

# Advanced Practice Nurse–Led Cardiogeriatric Heart Failure Pathways: A Narrative, Practice-Based Description of an Integrated Care Model

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**Aim:** To describe and conceptually examine a nursing-led cardiogeriatric heart failure (HF) pathway in which Advanced Practice Nurses (APNs) assume expanded clinical and organisational leadership roles.

**Background:** HF predominantly affects older adults and is frequently associated with frailty, multimorbidity, and reduced physiological reserve. Conventional hospital-centred models often expose frail older patients to functional decline and iatrogenic harm, highlighting the need for integrated, outpatient-oriented care pathways.

**Design:** Descriptive, narrative, and conceptual practice-based innovation report.

**Methods:** This paper reports the development and implementation of an APN-led cardiogeriatric HF pathway at Hôpital La Porte Verte. The model integrates day hospital interventions, medication titration, therapeutic education, telemonitoring, and interprofessional coordination. No formal quantitative evaluation, comparative analysis, or systematic literature review was conducted.

**Results:** The pathway illustrates how APNs can operate beyond traditional supportive roles, assuming advanced clinical decision-making, risk management, and organisational leadership in the care of frail older adults with HF. The model supports continuity of care, patient and caregiver empowerment, and safer management of complex clinical situations.

**Conclusion:** This innovative approach contributes to the understanding of APN roles in cardiogeriatric HF care. It highlights the potential of APNs as frontline clinical leaders in integrated care models and provides a potentially transferable framework to inform future nursing practice, leadership, and research. This descriptive, practice-based report is intended to inform real-world practice and support the transferability of APN-led integrated care models across healthcare systems.

**Keywords:** heart failure, older adults, advanced practice nurse, cardiogeriatric care, patient education, remote monitoring

## Introduction

The ageing of the global population represents one of the most important challenges for healthcare systems. By 2050, the number of people aged 80 years and above will triple worldwide, and cardiovascular disease remains the leading cause of mortality and morbidity in this group.[1] Heart failure (HF) is particularly prevalent, affecting more than 10% of individuals over 80.[2]

Older patients with HF are seldom "pure cardiology" cases. They frequently present with multimorbidity, frailty, cognitive decline, and polypharmacy.[3] Hospitalization, often the default pathway for acute decompensation or treatment adjustment, is associated with complications such as delirium, functional decline, infections, and loss of autonomy.[4]

Guideline-directed medical therapy (GDMT) significantly improves survival and quality of life,[5] but older adults are underrepresented in clinical trials and often undertreated.[6] There is therefore a pressing need to design care models that provide acute treatment and optimization in an outpatient setting, while maintaining safety and continuity.

APNs, and more broadly nurse-led HF programmes, have demonstrated effectiveness in HF management, particularly in treatment titration, patient education, and coordination with primary care.[7–10] Nurse-led programs have shown

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reductions in readmissions and improvements in quality of life.[8] In France, innovative cardiogeriatric and telemonitoring pathways have been described, highlighting the potential of integrated approaches.[11,12] However, the role of APNs in cardiogeriatrics—at the intersection of HF management, geriatric medicine, and multidisciplinary care—remains underexplored.

In France, APNs (infirmiers en pratique avancée) are regulated health professionals trained at master's level and authorised to contribute to structured care pathways for chronic diseases within a defined regulatory framework and in collaboration with physicians. Their scope of practice includes advanced clinical assessment, follow-up, therapeutic education, and care coordination, although prescribing authority and independent decision-making remain partly shaped by national regulations and local governance structures.

This article describes the experience of Hôpital La Porte Verte, where APNs have been fully integrated into a cardiogeriatric pathway structured around several day hospital (DH) units, bedside education, valve clinic assessments, and telemonitoring.

Figure 1 provides a conceptual representation of the local APN-led cardiogeriatric HF pathway implemented at Hôpital La Porte Verte and is intended to illustrate its organisational structure rather than a universally validated model.

Beyond describing an organisational model, this work seeks to contribute to the understanding of advanced nursing practice, clinical leadership, and integrated care delivery in cardiogeriatric HF.

## Data Sources and Approach

This manuscript is a descriptive, single-centre, practice-based report of an organisational innovation in cardiogeriatric HF care. It combines a narrative account of the local care pathway implemented at Hôpital La Porte Verte with a conceptual reflection on the contribution of APNs to integrated care delivery. The paper draws on the implementation and maturation

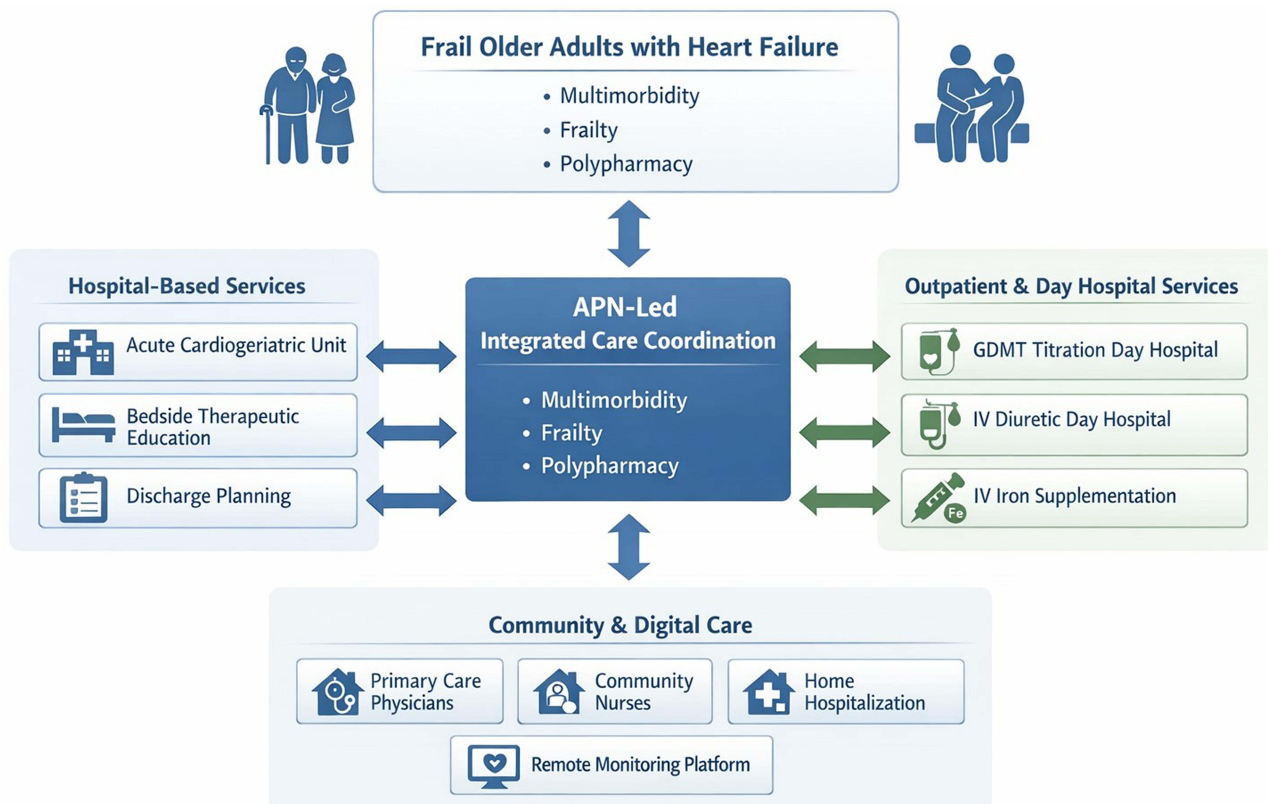


**Figure 1** Conceptual representation of a local APN-led cardiogeriatric pathway (Hôpital La Porte Verte). The figure illustrates how Advanced Practice Nurses coordinate care across inpatient cardiogeriatric units, outpatient day-hospital programmes, community-based follow-up, and telemonitoring. It is intended to represent the local organisational model and its key interfaces rather than a universally validated framework.

of an APN-led pathway, integrating clinical practice, organisational processes, and professional experience within a real-world cardiogeriatric setting.

Hôpital La Porte Verte is a specialised hospital in Versailles, France, with a dedicated cardiogeriatrics department caring for older adults with cardiovascular disease, frailty, and multimorbidity. The pathway described here was developed within this real-world clinical setting, which combines inpatient cardiogeriatric care, outpatient day-hospital activities, multidisciplinary assessment, and telemonitoring-supported follow-up.

This work does not aim to provide a systematic or exhaustive review of the literature. The selection of references was narrative and practice-informed rather than systematic, with the aim of contextualising the described care model within the existing literature rather than synthesising evidence comprehensively. Consistent with the objectives of the Journal of Multidisciplinary Healthcare, this paper focuses on the description of a real-world integrated care pathway and its potential implications for multidisciplinary practice, advanced nursing roles, and health service delivery.

It is not a formal evaluative study and was not designed to assess comparative effectiveness, clinical outcomes, cost-effectiveness, or statistical associations. No formal quantitative evaluation, systematic literature search, or comparative analysis was conducted. The aim is therefore to describe the model, examine its contribution to advanced nursing practice, and discuss its implications for multidisciplinary leadership, care integration, and future research. This manuscript should thus be interpreted as a descriptive, practice-based account of an organisational model rather than as an evaluative study.

## Ethical Considerations

As this work reports a descriptive and conceptual analysis of an organisational care model without original data collection or use of identifiable patient information, formal ethical approval was not required. The described pathway is implemented within existing clinical governance and regulatory frameworks. All aspects of care are delivered in accordance with principles of patient-centred decision-making, respect for autonomy, and established ethical standards.

# Results

The following section provides a descriptive account of the organisational model and clinical processes embedded in the APN-led cardiogeriatric HF pathway. It presents the structure and functioning of the care pathway rather than quantitative or comparative study results.

Although APNs play a central coordinating and clinical role in this pathway, all interventions are delivered within a physician-supported multidisciplinary framework involving cardiologists, geriatricians, dietitians, nurses, community physicians, visiting nurses, and other allied health professionals depending on clinical needs.

Where activity volumes are reported for day-hospital programmes, these figures refer to day-hospital visits rather than unique patients, as multiple visits per patient are common in this care model.

## Day Hospital for Treatment Titration

Optimization of GDMT in the older adults is particularly challenging, as comorbidity, frailty, and renal dysfunction increase the risk of intolerance.[6] Nevertheless, under-treatment is associated with a higher risk of rehospitalisation, symptom persistence, functional decline, and mortality.[13]
In our titration DH:

- APNs conduct structured clinical evaluations and geriatric assessments using structured and validated geriatric assessment tools, including the Clinical Frailty Scale, Katz Activity of Daily Living (ADL), Instrumental Activity of Daily Living (IADL), Mini Nutritional Assessment, and brief cognitive screening tools.[14]
- They also provide therapeutic education on HF, including treatment management, recognition of adverse effects, and appropriate responses to decompensation.
- Titration of HF treatments is performed under cardiologist supervision, with APNs responsible for monitoring tolerance and early identification of side effects.[5,7]

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- The DH program is complemented by a dietitian-led assessment and personalized nutritional counseling, as well as echocardiography performed by the cardiogeriatrician to guide therapeutic adjustments.
- Follow-up visits every 1–2 weeks ensure safe, stepwise optimization.
- Since September 2025, 53 day-hospital visits were conducted within this program.

This model is informed by nurse-led titration clinics described in the literature, while remaining adapted to the French regulatory context. In our pathway, APNs conduct assessment, education, and follow-up monitoring, whereas treatment titration decisions are made within a cardiologist-supervised framework. This differs from fully physician-led models by placing APNs at the centre of longitudinal monitoring and care coordination, while preserving medical oversight for treatment adjustment.[8]

## Day Hospital for Intravenous Diuretic Therapy

Congestion is the main cause of hospitalization in HF and a key driver of morbidity.[15] In older adults, conventional hospitalization carries high risks, including functional decline and delirium.[4]
At our diuretic DH:

- APNs assess congestion clinically (edema, jugular venous pressure, auscultation).
- Intravenous diuretics are administered and monitored with close supervision of urine output, electrolytes, and renal function.[5]
- Intravenous diuretic therapy is prescribed within a physician-led medical framework, while APNs play a central role in pre-treatment assessment, treatment monitoring, and coordination of subsequent care.
- Patients are reassessed within hours, and APNs coordinate discharge, repeated DH visits, or transfer to inpatient units if necessary.
- Community coordination is systematically ensured with primary care physicians and visiting nurses.
- Since January 2025, 169 day-hospital visits were conducted within this program.

This approach aligns with evidence showing the feasibility of outpatient IV diuretic therapy in selected patients,[8] and with the Diuretic Outpatient Management in Elderly Heart Failure (DOME-HF) study, the first structured European implementation of a diuretic day hospital dedicated to very elderly patients with HF.[16]

## Day Hospital for Intravenous Iron Supplementation

Iron deficiency in patients with HF is highly prevalent and is associated with reduced functional capacity, poorer quality of life, and worse prognosis.[17]
At La Porte Verte:

- APNs identify patients using guideline criteria (ferritin <100 µg/L, or 100–299 µg/L with transferrin saturation <20%).[5]
- They administer intravenous ferric carboxymaltose safely, with close monitoring for adverse reactions.[17]
- Comprehensive assessment includes additional tests such as the Clock Drawing Test, the Kansas City Cardiomyopathy Questionnaire (KCCQ) for quality of life, and the 6-minute walk test to evaluate functional capacity.
- Patients and caregivers receive education on fatigue management and nutrition, with coordination between hospital-based and outpatient follow-up.
- Since January 2025, 301 day-hospital visits were conducted within this program.

## Bedside Therapeutic Education

Beyond DH programs, APNs provide bedside therapeutic education during hospitalization in acute cardiogeriatric units. This includes:

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- Explaining new medications and titration strategies directly to patients and caregivers at the bedside.
- Reinforcing adherence strategies (pillboxes, reminders).
- Educating about self-monitoring (weight, blood pressure, warning signs).
- Involving caregivers directly in the hospital room, adapting communication to cognitive status and literacy levels.
- Coordinating post-discharge care pathways, ensuring integration with outpatient services such as day hospital programs, home-hospitalization, and community nursing.
- Introducing and explaining telemonitoring solutions (eg, Satelia® Cardio), including how alerts are generated and managed, to improve patient engagement and caregiver reassurance.
- Formal activity counts were not prospectively collected for this component; however, the programme has been active since January 2023.

This bedside role strengthens continuity of education, facilitates coordination of the care pathway, and ensures that patients leave the hospital with a clear understanding of their treatment plan.[18]

## Pre-Intervention Geriatric Assessments in Valve Clinics

Many patients are referred for advanced cardiovascular procedures, including transcatheter aortic valve implantation (TAVI), percutaneous mitral (MitraClip) and tricuspid (TriClip) interventions, atrial flutter or atrial fibrillation ablation, atrioventricular node ablation, coronary angiography, and pacemaker implantation.
In these cases, APNs perform standardized geriatric evaluations before procedures:

- Frailty scoring (Clinical Frailty Scale, gait speed, grip strength).
- Cognitive assessment.
- Nutrition and functional status evaluation (MNA, Katz ADL, IADL).
- Formal activity counts were not prospectively collected for this component; however, the programme has been active since January 2023.

Findings are discussed in Cardiogeriatric Heart Team meetings and directly influence clinical decision-making (intervention vs. conservative management vs. palliative orientation). The APN thus contributes to aligning interventional cardiology with geriatric principles.[19]

## Telemonitoring via Satelia® Cardio

After discharge, many HF patients at Hôpital La Porte Verte are followed through telemonitoring with Satelia® Cardio. The APN is the first line of response for alerts:

- Reviewing daily transmitted data and identifying moderate-risk (“orange”) alerts that require prompt clinical reassessment and high-risk (“red”) alerts suggestive of possible acute decompensation requiring urgent intervention.
- Contacting patients by phone to assess clinical status.
- Escalating cases to the cardiologist in the presence of worsening dyspnoea, rapid weight gain, symptomatic hypotension, suspected arrhythmia, renal function deterioration, persistence of alerts despite first-line measures, or diagnostic uncertainty.
- Coordinating with community caregivers to implement rapid interventions.
- Since April 2023, over 1200 patients have been followed within routine clinical care through this activity.

Outside emergency situations, follow-up is conducted through scheduled phone calls, review of transmitted data, coordination with community professionals, and referral to planned day-hospital reassessment when treatment adaptation or clinical review is required.

This APN-led workflow is intended to support rapid, personalised responses, may help reduce avoidable hospitalisations, and may enhance patient safety while supporting integrated care across hospital and community settings.[20–22]


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## Discussion

Compared with conventional disease-centred pathways, which often rely on episodic physician-led consultations and hospital admission for decompensation or treatment adjustment, this model is designed to provide more continuous, multidimensional, and outpatient-oriented care. By integrating geriatric assessment, day-hospital interventions, bedside education, and telemonitoring, the pathway aims to anticipate instability earlier and to support care transitions more effectively in frail older adults.

### APNs as Clinical and Organisational Leaders in Cardiogeriatric HF Care

This practice innovation highlights how APNs can act as organizational and clinical leaders in cardiogeriatric HF pathways. Extending their role beyond traditional supportive functions, APNs contribute not only to direct patient care but also to the coordination and efficiency of healthcare delivery systems.

At Hôpital La Porte Verte, APNs combine structured geriatric assessment, therapeutic education, medication titration under cardiologist supervision, and telemonitoring management. Their leadership may support continuity of care across hospital and community settings, help bridge cardiology and geriatric expertise, and strengthen patient and caregiver empowerment. This dual role—clinical and organizational—positions APNs as important contributors to innovation in integrated care delivery and clinical service organisation.

### Operationalising Cardiogeriatric Competencies Through Advanced Nursing Practice

Recent competency-based frameworks in geriatric cardiology highlight the need for integrated, system-oriented approaches that bridge cardiovascular expertise with geriatric principles. The present APN-led model illustrates how such competencies can be operationalised in daily clinical practice through nursing leadership and coordinated care pathways.[23]

From a health system and service delivery perspective, this model suggests how nurse-led pathways may support more efficient resource use, may help reduce reliance on inpatient hospitalisations, and may offer safer, patient-centred alternatives through day hospitals and telemonitoring. Importantly, it suggests real-world feasibility for embedding APNs as frontline contributors to decision-making within multidisciplinary teams, thereby informing ongoing reflections on workforce transformation in cardiology and geriatrics.

### Advanced Nursing Practice Beyond Coordination: Autonomy, Clinical Reasoning, and Accountability

This cardiogeriatric HF pathway illustrates how APNs can operate beyond traditional coordination or supportive roles and assume a genuinely advanced scope of clinical and organisational practice. Rather than focusing solely on task delegation, this model highlights the contribution of APNs as clinicians involved in advanced decision-making and in managing complexity, uncertainty, and risk in frail older adults with HF.

In the French context, this autonomy should be understood as structured and relational rather than fully independent. APNs operate within a regulated scope of practice and in close collaboration with physicians, with varying degrees of delegated or protocol-supported decision-making depending on the clinical task and local governance arrangements.

This model aligns with contemporary frameworks of advanced clinical practice, in which APNs combine expert clinical reasoning, professional autonomy, and clinical leadership to manage complexity in chronic disease. In line with established models of APNs role development, the contribution of APNs extends beyond task execution to include system-level coordination, anticipatory decision-making, and responsibility for patient-centred outcomes in complex care pathways. Such an approach reflects the evolving conceptualisation of advanced nursing practice as both a clinical and organisational role.

### Integrative Clinical Reasoning in Frail Older Adults with HF

At the core of this model lies a graduated clinical autonomy, characterised by an iterative process of comprehensive assessment, decision-making, action, and reassessment. APNs integrate structured geriatric assessment, cardiovascular

evaluation, medication titration under cardiologist supervision, and telemonitoring data to dynamically adjust care plans. This continuous loop of clinical reasoning reflects key attributes of advanced nursing practice, including expert assessment skills, anticipatory thinking, and accountability for patient outcomes, as described in established APNs frameworks.[24,25]

Importantly, the clinical reasoning mobilised in this pathway is integrative rather than protocol-driven. APNs simultaneously consider cardiovascular status, frailty markers, cognitive function, social context, and patient priorities when making therapeutic decisions.[26] This multidimensional reasoning goes beyond traditional disease-centred coordination and aligns with advanced nursing competencies in managing complex chronic conditions, where standardised algorithms are often insufficient or inappropriate for frail populations.[24] In this context, APNs function as knowledge brokers who synthesise biomedical, functional, and contextual information to support proportionate and patient-centred care.

## Managing Uncertainty and Risk: A Hallmark of Advanced Nursing Leadership

The management of clinical uncertainty and risk is another defining feature of advanced practice in this model. In frail older adults, therapeutic decisions—such as medication titration, day-hospital interventions, or escalation of care—are rarely binary and often involve balancing competing risks, including functional decline, iatrogenesis, and hospital-related harms. APNs play a central role in navigating these trade-offs, engaging in shared decision-making with patients and caregivers, and ensuring close monitoring and timely reassessment. This capacity to tolerate uncertainty while maintaining patient safety is a recognised hallmark of advanced nursing practice and clinical leadership.[25,27] This model may inform the implementation of advanced clinical roles in integrated cardiogeriatric care by providing a descriptive example of how such practice may be operationalised in cardiogeriatric HF care through integrated clinical reasoning, leadership, and system-level coordination.

## Clinical Leadership at the Point of Care and System-Level Impact

Beyond individual patient care, this model also exemplifies clinical leadership at the point of care. APNs act as organisational anchors within multidisciplinary teams, facilitating communication between cardiologists, geriatricians, community providers, and caregivers. Their embedded position enables them to identify system inefficiencies, anticipate care transitions, and adapt pathways in real time. Such leadership is relational, practice-based, and grounded in clinical expertise, aligning with contemporary conceptions of advanced nursing leadership that emphasise influence, coordination, and system-level impact rather than hierarchical authority.[27]

Taken together, this cardiogeriatric pathway illustrates how APNs may operationalise advanced nursing competencies in complex cardiovascular care. By combining expert clinical reasoning, structured autonomy, risk management, and frontline leadership, this model contributes to the evolving understanding of advanced nursing practice as a potential driver of innovation in integrated care for frail older adults.

## Transferability and Implications for Health Systems

Although developed within the French healthcare system, this model is likely transferable to other European contexts, where ageing populations and healthcare resource constraints are common. It was progressively implemented at Hôpital La Porte Verte from 2022, in parallel with the growing structuring of APN roles and cardiogeriatric pathways in France. Although shaped by the French regulatory environment, it shares several features with international nurse-led HF models, including longitudinal follow-up, structured education, treatment monitoring, and integration across care settings. Its implementation requires institutional support, regulatory recognition of APN roles, and investment in specialised training.

Nevertheless, the underlying principles—nurse-led titration clinics, day hospital interventions, bedside therapeutic education, and telemonitoring integration—are broadly relevant across diverse international health systems.

Several barriers to implementation should nevertheless be acknowledged. These include variable regulatory recognition of APN roles, limited availability of cardiogeriatric training, the need for strong cardiologist support and interprofessional trust, dependence on day-hospital infrastructure, and the time required to build coordination with community providers. These barriers may limit immediate transferability, particularly in settings with fragmented ambulatory care or limited institutional support.

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## Strengths of the Model

A key strength of this model lies in its integration of advanced clinical reasoning, organisational leadership, and continuity of care within a single APN-led pathway. By embedding APNs at the point of care across multiple settings, the pathway is designed to support timely decision-making, risk anticipation, and patient-centred care for frail older adults.

## Limitations

This work is a descriptive and conceptual report of an organisational innovation rather than a formal evaluative study. As such, it does not provide quantitative outcome measures, comparative analyses, or statistical assessments of effectiveness. The absence of predefined clinical, functional, or economic endpoints limits conclusions regarding the direct impact of the APNs-led cardiogeriatric pathway on patient outcomes, healthcare utilisation, or cost-effectiveness. Future multi-centre studies using mixed-methods or comparative designs will be necessary to evaluate the reproducibility and measurable benefits of this model.

From a professional perspective, the implementation of advanced nursing roles in cardiogeriatric HF care raises important questions regarding professional boundaries, accountability, and shared responsibility between APNs and physicians. Although medication titration and clinical decisions are performed under cardiologist supervision, the expansion of APNs autonomy inevitably requires clear governance frameworks, role definitions, and medico-legal safeguards. Variability in scope of practice regulations across countries may therefore influence both the feasibility and acceptability of similar models.

Organisational limitations must also be acknowledged. This model was developed within the French healthcare system, where regulatory recognition of APNs, institutional support, and access to structured training programmes are evolving but not yet uniform. Its implementation relies on sustained organisational commitment, interprofessional trust, and adequate staffing levels. Furthermore, the concentration of clinical, coordinative, and leadership responsibilities within APNs roles may expose professionals to increased cognitive load and emotional burden, raising concerns regarding long-term role sustainability and workforce wellbeing.

Despite these limitations, this practice innovation provides a structured framework to explore how APNs roles can contribute to integrated cardiogeriatric care. It offers a pragmatic foundation for future research and organisational reflection on the role of nursing leadership in managing complexity and frailty in HF populations.

## Implications for Future Research

Future research is needed to move beyond descriptive models and formally evaluate the impact of APN–led cardiogeriatric pathways. Multicentre studies across different healthcare systems would help assess the reproducibility, scalability, and contextual adaptability of such models. Evaluation should not be limited to traditional biomedical outcomes but should prioritise indicators particularly relevant to frail older adults, including functional status, quality of life, continuity of care, and patient and caregiver experience. In addition, health service outcomes such as unplanned hospitalisations, care transitions, and resource utilization should be explored. Further research is also warranted to better define the role of APNs within integrated geriatric care models, including their contribution to clinical decision-making, risk management, and interprofessional coordination. Although developed within the French healthcare system, the principles underpinning this model are applicable to a wide range of international contexts facing ageing populations and workforce challenges. Finally, qualitative and mixed-methods approaches could provide valuable insights into professional boundaries, role sustainability, and the long-term impact of advanced nursing leadership on workforce development and integrated care delivery.

## Implications for Multidisciplinary Practice

- This model illustrates how APNs can act as frontline clinical leaders within multidisciplinary cardiogeriatric teams.
- It provides a potentially transferable framework for integrating day-hospital care, telemonitoring, and bedside therapeutic education in frail older adults with HF.
- Implementation requires clear governance, interprofessional collaboration, and institutional support for advanced nursing roles.

- The pathway may help support continuity of care and may have the potential to reduce avoidable hospitalisations in ageing populations.
- Similar principles could potentially be adapted to other chronic cardiovascular conditions and healthcare systems.

## Conclusion

This descriptive, practice-based report illustrates how APNs can occupy a central clinical and organisational role within a cardiogeriatric HF pathway spanning acute care, transitional care, and long-term follow-up. By integrating day-hospital management, bedside education, multidisciplinary coordination, and telemonitoring, the model offers a structured example of how advanced nursing practice may support continuity of care in frail older adults with HF.

Because this work is not a formal evaluative study, no conclusions can be drawn regarding effectiveness, acceptability, or comparative benefit. Nevertheless, the model provides a pragmatic framework for future research on APN-led cardiogeriatric pathways and their potential contribution to integrated care in ageing populations.

### Implications for the Profession and/or Patient Care

Advanced Practice Nurse–led cardiogeriatric pathways may enhance integrated, patient-centred HF care for frail older adults while supporting clinical leadership, multidisciplinary collaboration, and role development in advanced nursing practice.

## Abbreviations

APN, Advanced Practice Nurse; DOME-HF, Diuretic Outpatient Management in Elderly Heart Failure; HF, Heart Failure.

## Ethical Approval and Consent to Participate

This article describes an organizational innovation and does not involve research on human participants or animals. Ethical approval was therefore not required.

## Consent for Publication

Not applicable. The manuscript does not include any individual person's data in any form (images, videos, or identifiable details).

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## Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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## Disclosure

Sophie Nisse Durgeat is employed by NP Medical. All other authors declare that they have no conflicts of interest related to this work.

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