

POLICY BRIEF

Nuclear Medicine Imaging in Cardiovascular Health: A value-based investment for Europe's health systems

Key message: Nuclear medicine provides precise, non-invasive functional and molecular information that improves diagnostic certainty, supports more targeted care pathways, and can reduce unnecessary downstream testing and invasive procedures. In the context of the EU Safe Hearts Plan, it should be recognised as an important component of high-quality, risk-based and equitable cardiovascular care.



THE CHALLENGE

Cardiovascular disease remains Europe's largest health burden

Cardiovascular disease (CVD) remains the leading cause of death and disability in the European Union (EU) and costs the EU economy more than €282 billion each yearⁱ: indeed, a large proportion of cardiovascular disease in Europe is still diagnosed too late or managed through inefficient diagnostic pathways, leading to avoidable hospitalisations and unnecessary invasive procedures. This growing burden puts sustained pressure on healthcare systems and reinforces the **need for more effective, sustainable and equitable approaches to prevention, diagnosis and care**.

Improving early detection is essential. A substantial proportion of cardiovascular disease is still diagnosed too late, leading to avoidable complications, hospitalisations and long-term costs. In this context, accurate and timely diagnosis is not only a clinical priority, but also a **health system priority**.ⁱⁱ

THE EVIDENCE

What nuclear medicine delivers

Nuclear medicine enables earlier, more accurate and more targeted cardiovascular care, improving outcomes while reducing unnecessary procedures and healthcare costs.

Nuclear medicine provides **functional and molecular information** that **complements clinical evaluation** and **helps guide decision-making across the cardiovascular care pathway**. In patients with an intermediate or uncertain risk profile, **advanced imaging techniques** such as myocardial perfusion imaging (PET and next-generation SPECT, i.e. cadmium-zinc-telluride detector systems) can improve the accuracy of disease assessment, support appropriate triage between medical therapy and invasive procedures and help avoid unnecessary testing.

Its value extends beyond coronary artery disease. Nuclear medicine also plays an **important role in the early identification of specific and underdiagnosed conditions**, such as transthyretin cardiac amyloidosis, where validated imaging approaches can enable non-invasive confirmation of

disease in appropriately selected patients (thus, avoiding biopsy) and earlier access to specialist care and treatment.

By improving diagnostic certainty and supporting better targeted care pathways, nuclear medicine can contribute to **more efficient use of healthcare resources, reduce avoidable downstream interventions**, and support a **more personalised approach to cardiovascular care**.

At the same time, **access to advanced nuclear cardiology remains uneven across the EU**. Availability of state-of-the-art myocardial perfusion imaging and amyloidosis scintigraphy, including both PET and next-generation SPECT, is still concentrated in a limited number of centres and regions. As a result, patients' access to accurate, guideline-recommended cardiovascular diagnosis continues to depend **more on geography than on clinical need**, contributing to persistent inequalities in cardiovascular outcomes across Member States.

THE EVIDENCE

Where nuclear medicine adds measurable value

Myocardial perfusion imaging: better decisions, fewer unnecessary procedures

Advanced myocardial perfusion imaging (MPI) enables **more accurate diagnosis and personalised decision-making, reducing unnecessary procedures and improving efficiency across the cardiovascular care pathwayⁱⁱⁱ**.

In many countries, patients with suspected coronary artery disease are still referred directly for invasive testing, despite a significant proportion not requiring intervention. As such, clinical assessment alone often leads to uncertainty and the overuse of invasive diagnostic procedures, exposing patients to unnecessary risks and placing additional pressure on healthcare resources. Advanced MPI (PET and next-generation SPECT) provides a more accurate assessment of the functional significance of disease, supporting more appropriate clinical decision-making.

By measuring absolute individual myocardial blood flow (MBF) and comparing it with age-, sex-, and disease-specific reference values, quantitative MPI:

- enables **more personalised cardiovascular care**
- allows clinicians to **stratify patients' risk** more precisely
- supports better targeting of interventions (reducing unnecessary invasive angiography and improving patient selection for medical therapy versus revascularisation).

Transthyretin Cardiac amyloidosis: enabling early diagnosis

Cardiac amyloidosis is an **underdiagnosed cause of heart failure** that is often detected too late. Nuclear medicine imaging enables a **non-invasive diagnosis**, replacing the need for invasive biopsy in appropriately selected patients and allowing earlier identification of patients who can benefit from disease-modifying therapies.

Evidence shows that **early diagnosis enables access to treatments that improve survival and reduce hospitalisations**, particularly when initiated early in the disease course:

- Enables earlier diagnosis of a condition where treatment improves outcomes
- Reduces delays and avoids invasive diagnostic procedures
- Supports timely access to specialist care and more effective disease management.

Nuclear cardiology encompasses additional important applications with significant clinical impact, including evaluation of cardiac denervation^{iv}, sarcoidosis^v, endocarditis, prosthesis evaluation^{vi} and therapy-related cardiotoxicity^{vii}.

THE POLICY WINDOW

the EU Safe Hearts Plan

The EU Cardiovascular Health Plan (Safe Hearts Europe) provides a **timely opportunity to strengthen prevention, early detection and the quality of cardiovascular care** across Member States. By placing **prevention, risk-based screening and integrated care pathways** at the centre of EU action, the Plan establishes a clear framework for embedding effective diagnostic strategies within Europe's flagship health initiatives, particularly those supporting cardiovascular health checks and early disease detection.

Within this context, nuclear medicine can support the implementation of more precise, **risk-based and pathway-oriented care: nuclear medicine provides concrete, ready-to-deploy tools to operationalise the Plan's objectives on early detection and risk-based care**. It provides objective functional and molecular information that complements clinical assessment and helps refine diagnostic and treatment decisions. This is particularly relevant not only for coronary artery disease **risk stratification**, but also for the **early identification of underdiagnosed yet treatable conditions such as transthyretin cardiac amyloidosis**.

Nuclear cardiology should therefore be understood not only as a diagnostic tool, but as a **contributor to more efficient and sustainable healthcare systems**. By integrating high-accuracy molecular imaging into cardiovascular care pathways, health systems can **reduce avoidable diagnostic procedures and better target interventions**. This can help limit downstream costs associated with late-stage disease, including emergency admissions, invasive procedures and long-term care, while improving patient outcomes and supporting the overall efficiency of healthcare delivery.

"The success of the EU Safe Hearts Plan will depend on how effectively we translate early detection into better clinical decisions. Nuclear medicine plays a key role in this: it not only improves diagnosis, but directly guides treatment. This more precise approach can reduce unnecessary procedures, improve patient outcomes and make better use of healthcare resources across Europe."

Prof. Paola Anna Erba, EANM President



POLICY RECOMMENDATIONS

1

Recognise nuclear medicine (functional and molecular imaging) in EU-level pathway guidance as a second-line, evidence-based diagnostic step for selected high-risk groups identified through health checks and clinical assessment.

2

Reduce inequalities in access by supporting Member States in developing minimum service and quality standards (equipment, workforce and quality assurance) for nuclear cardiology and amyloidosis scintigraphy.

3

Align reimbursement with clinical value by promoting reimbursement that reflect patient benefit and support equal access across the EU for evidence-based nuclear cardiology procedures and encouraging the use of outcome-based and value-based purchasing model where appropriate.

4

Strengthen workforce capacity by supporting training, competency frameworks and multidisciplinary collaboration in cardiovascular imaging (including interpretation standards and multidisciplinary referral pathways).

5

Strengthen evidence generation and data interoperability by support pragmatic health-economic studies and real-world outcome registries.

REFERENCES

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- ⁱ Luengo-Fernandez R, Walli-Attaei M, Gray A, et al. Economic burden of cardiovascular diseases in the European Union: a population-based cost study. *Eur Heart J*. 2023;44:4752–4767
- ⁱⁱ Ibid.
- ⁱⁱⁱ Mimouni M, Bulsei J, Darlington M, et al. Cost-effectiveness of 82-Rubidium PET myocardial perfusion imaging... *EJNMMI Res*. 2023;13:9.
- ^{iv} The role of myocardial innervation imaging in different clinical scenarios: an expert document of the European Association of Cardiovascular Imaging and Cardiovascular Committee of the European Association of Nuclear Medicine (2021)
- ^v [2] Procedural recommendations of cardiac PET/CT imaging: standardization in inflammatory-, infective-, infiltrative-, and innervation (4Is)-related cardiovascular diseases: a joint collaboration of the EACVI and the EANM (2020)
- ^{vi} 2023 ESC Guidelines for the management of endocarditis: Developed by the task force on the management of endocarditis of the European Society of Cardiology (ESC). *Endorsed by the European Association for Cardio-Thoracic Surgery (EACTS) and the European Association of Nuclear Medicine (EANM)*
- ^{vii} Nuclear medicine in the assessment and prevention of cancer therapy-related cardiotoxicity: prospects and proposal of use by the European Association of Nuclear Medicine (EANM) (2023)