Why the heart team model is essential as structural options multiply

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The management of structural heart disease has grown increasingly complex, moving beyond traditional surgical interventions to encompass a wide array of transcatheter therapies. This proliferation of options, while beneficial for patients, presents a significant challenge for clinicians tasked with selecting the most appropriate treatment. The heart team model has emerged as a critical framework to navigate this intricate clinical landscape, ensuring that every patient receives a tailored, evidence-based strategy.

KEY TAKEAWAYS

- The Pivot: The increasing complexity and number of structural heart disease interventions necessitate a multidisciplinary approach to patient care.
- The Data: No specific numeric data is available for this general topic.
- The Action: Clinicians should actively engage with and advocate for the heart team model in their institutions to optimize patient outcomes.

Structural heart disease encompasses a broad spectrum of conditions affecting the heart valves, septa, and great vessels. Historically, surgical repair or replacement was the primary, often sole, definitive treatment for many of these pathologies. Conditions like severe aortic stenosis, mitral regurgitation, and atrial septal defects typically required open-heart surgery, a procedure associated with significant morbidity, mortality, and prolonged recovery times, particularly in elderly or frail patients. This surgical dominance meant that treatment decisions, while complex, largely revolved around surgical risk stratification and timing.

The advent of transcatheter therapies has fundamentally altered this paradigm. Transcatheter aortic valve implantation (TAVI) for aortic stenosis, for example, has moved from a therapy reserved for high-risk surgical candidates to a viable option for intermediate and even low-risk patients. Similarly, transcatheter mitral valve repair (TMVr) and replacement (TMVR) are rapidly evolving, offering less invasive alternatives for mitral valve disease. Beyond valves, percutaneous closure devices for patent foramen ovale (PFO) and atrial septal defects (ASD), as well as left atrial appendage occlusion (LAAO) for stroke prevention in atrial fibrillation, have expanded the interventional toolkit. Each of these procedures carries its own unique set of indications, contraindications, technical considerations, and potential complications, making simple, unilateral decision-making increasingly untenable.

The Evolution of Decision-Making in Cardiology

The traditional model of care often placed the primary decision-making burden on a single specialist, typically the cardiac surgeon or interventional cardiologist. While these specialists possess deep expertise in their respective fields,

the sheer volume of available data for each new device and technique now exceed the capacity of any single individual to master comprehensively. A patient presenting with severe aortic stenosis and concomitant severe mitral regurgitation, for instance, might be a candidate for TAVI, surgical aortic valve replacement (SAVR), TMVr, or surgical mitral valve repair (SMVr), or a combination of these, depending on their overall clinical profile, comorbidities, and anatomical suitability. The choice is rarely straightforward.

This is where the heart team model proves indispensable. It mandates a collaborative approach, bringing together a diverse group of specialists to review each complex case. The core members typically include interventional cardiologists, cardiac surgeons, imaging specialists (echocardiographers, cardiac CT/MRI experts), cardiac anaesthesiologists, and heart failure specialists. Depending on the patient's specific needs, geriatricians, nephrologists, neurologists, and palliative care specialists may also be integrated. This collective expertise ensures a holistic assessment of the patient, considering not just the anatomical lesion but also the patient's functional status, comorbidities, frailty, cognitive function, and personal preferences.

What the Heart Team Actually Does

The heart team's primary function is to synthesize diverse clinical information into a cohesive, individualized treatment plan. This process begins with a thorough diagnostic workup, often involving advanced imaging modalities. For example, in aortic stenosis, a comprehensive echocardiogram is standard, but a cardiac CT scan is essential for TAVI planning, providing detailed anatomical measurements of the aortic annulus, access vessels, and coronary arteries. The imaging specialist's interpretation of these studies is vital for determining device size, approach, and potential complications.

Once the diagnostic data is assembled, the team convenes to discuss the case. The interventional cardiologist might present the feasibility of a transcatheter approach, outlining the specific device options and procedural risks. The cardiac surgeon would then offer the surgical perspective, detailing the benefits of a durable repair or replacement, the risks of open-heart surgery, and the potential for concomitant procedures. The heart failure specialist provides context on the patient's overall cardiac function and prognosis, while the geriatrician assesses frailty and cognitive reserve, factors that profoundly impact post-procedural recovery and quality of life. This comprehensive discussion allows for a balanced evaluation of risks and benefits across all available options.

The heart team also plays a critical role in managing patients with multiple comorbidities. A patient with severe mitral regurgitation, for example, might also have chronic kidney disease, severe chronic obstructive pulmonary disease, and a history of stroke. Each of these conditions influences the choice of intervention. Surgical risk calculators, while helpful, often do not fully capture the cumulative impact of such complex comorbidities. The collective clinical judgment of the heart team, informed by each specialist's domain expertise, provides a more accurate assessment of procedural risk and anticipated outcome. This collaborative approach also helps to avoid treatment silos, where a patient might be deemed unsuitable for one therapy by a single specialist, only to be overlooked for another equally viable option.

Ensuring Patient-Centred Care

A core tenet of the heart team model is patient-centred care. After the team has deliberated and formulated a recommendation, the patient and their family are brought into the discussion. The various treatment options, their associated risks and benefits, and the rationale behind the team's recommendation are explained in clear, understandable terms. This shared decision-making process empowers patients to make informed choices that align with their values

and goals of care. For some, longevity might be paramount, even with higher procedural risk. For others, maintaining quality of life and avoiding prolonged recovery might be the priority. The heart team facilitates this important dialogue, ensuring that the chosen path reflects the patient's individual preferences.

But the heart team's role extends beyond initial treatment selection. It also encompasses pre-procedural optimization and post-procedural follow-up. Before an intervention, the team may recommend specific therapies to improve the patient's condition, such as optimizing heart failure medications, managing anaemia, or improving nutritional status. After the procedure, the team collaborates on rehabilitation plans, medication management, and long-term surveillance. This continuous, coordinated care pathway is essential for maximizing long-term outcomes and detecting potential complications early. For example, patients undergoing TAVI require careful follow-up for valve durability and potential paravalvular leak, while those with TMVr need ongoing assessment of mitral valve function and left ventricular remodelling. The evolving market of heart failure treatment also means that post-procedural medical management is increasingly sophisticated and requires multidisciplinary input.

Where it Falls Short and What is Next

The implementation of a fully functional heart team model is not without its challenges. It requires significant institutional commitment, dedicated resources, and a culture of collaboration among specialists who may traditionally operate independently. Scheduling conflicts, differing professional perspectives, and the sheer time commitment can be barriers. But the evidence, though not always in the form of randomized controlled trials comparing heart team vs. no heart team, strongly supports its value in complex structural heart disease. Guidelines from major cardiology societies consistently recommend a heart team approach for most structural interventions.

The rapid pace of innovation in structural heart disease means that new devices and techniques are constantly emerging. This necessitates ongoing education and adaptation within the heart team. What was considered standard practice a few years ago may now be outdated. The team must remain agile, continuously evaluating new evidence and incorporating it into their decision-making algorithms. For instance, the discussion around novel antithrombotic strategies after certain interventions requires careful consideration of bleeding versus thrombotic risk, a balance best struck through multidisciplinary input. The Oxford Handbook of Cardiology remains a useful quick reference for established practice, but the cutting edge moves quickly.

The heart team model is not merely a recommendation; it is a necessity in modern structural heart disease management. As the therapeutic options continue to multiply, the complexity of patient selection and treatment planning will only increase. A collaborative, multidisciplinary approach ensures that patients receive the most appropriate, individualized care, optimizing both short-term procedural success and long-term quality of life. The future of structural heart disease care depends on the continued evolution and robust implementation of these integrated teams.

> **CLINICAL IMPLICATIONS**
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> The proliferation of transcatheter options for structural heart disease means that no single specialist can reasonably hold all the necessary expertise. Relying on a lone interventionalist or surgeon for complex cases is simply outdated. The heart team model is not a luxury; it is the standard of care, ensuring that all angles of a patient's clinical picture are considered.
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> For clinicians, this means actively participating in these multidisciplinary discussions. It is an opportunity

> to learn from colleagues across specialties and to contribute one's own expertise to a more robust decision-making process. The days of siloed practice in structural heart disease are over, or at least they should be.
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> The industry, too, must recognize the centrality of the heart team. Device development and clinical trial design should increasingly consider how new therapies integrate into this collaborative framework. Education and training initiatives should target the entire team, not just individual operators, to ensure widespread adoption and proficiency with novel technologies.
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> Patients benefit from this integrated approach. They receive a more thoroughly vetted treatment plan that considers their unique risks, comorbidities, and preferences. This collaborative model reduces the likelihood of suboptimal outcomes stemming from a narrow, single-specialty perspective.

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