ACORN AUSTRALIAN COLLEGE OF PERIOPERATIVE NURSES | JOURNAL OF PERIOPERATIVE NURSING

Volume 37
Issue 1 *Journal of Perioperative Nursing*

Article 2

2-8-2024

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Recommended Citation

Percy, Celeste G.; Howard, A. Fuchsia Dr.; Lee, Bobby Dr.; Sathananthan, Janarthanan Dr.; Wood, David A. Dr.; Webb, John G.; and Lauck, Sandra B. Dr. (2024) "'I want to be a member of my heart team': Insights from patients' experiences of minimalist transcatheter aortic valve implantation," *Journal of Perioperative Nursing*: Vol. 37 : Iss. 1 , Article 2.
Available at: https://doi.org/10.26550/2209-1092.1285

https://www.journal.acorn.org.au/jpn/vol37/iss1/2

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Cover Page Footnote

Acknowledgement: We thank Jopie Polderman and Leslie Achtem (St. Paul’s Hospital, Vancouver, Canada) for their support for research activities.

Peer-reviewed article

Authors

Celeste Percy
MSN, RN
St. Paul's Hospital,
University of British Columbia

Fuchsia Howard
PhD, RN
University of British Columbia

Bobby Lee
MD
St. Paul's Hospital,
University of British Columbia

Janarthanan Sathananthan
MBCHB, MPH
St. Paul's Hospital,
University of British Columbia

David Wood
MD
Vancouver General Hospital,
University of British Columbia

John Webb
MD
St. Paul's Hospital,
University of British Columbia

Sandra Lauck
PhD, RN
St. Paul's Hospital,
University of British Columbia

Corresponding author

Celeste Percy
MSN, RN
St. Paul's Hospital,
University of British Columbia

'I want to be a member of my heart team': Insights from patients' experiences of minimalist transcatheter aortic valve implantation

Abstract

Background: Internationally, transcatheter aortic valve implantation (TAVI) is the most common approach for treating aortic stenosis. There is growing evidence to support the implementation of a streamlined clinical pathway to optimise outcomes, improve capacity and facilitate safe early discharge home. Best practices that are emerging include adopting a minimalist approach and transition from general anaesthesia to conscious sedation or local anesthesia only. We aimed to explore what could be learned from patients' experiences of their care in this rapidly evolving context.

Methods: We conducted a qualitative study of patients in the first week after TAVI to explore their perspectives of the procedure and elicit their recommendations. We used interpretive description as the methodological approach to not only inform data collection and analysis but also to generate evidence to inform practice.

Results: We recruited 15 participants, five women and ten men, with a mean age of 83 years (±5.4) who had transfemoral TAVI with minimal sedation (n=14) in a hybrid operating room (n=6) or a cardiac catheter laboratory (n=9) and were discharged home without complications the day after their procedure. The overarching theme of 'I want to be a member of my heart team during my procedure' emerged, and was illustrated by three themes: 'Who am I to them?' (situating self in relation to the team), 'How can I be a good patient?' (knowing expectations of me) and 'How do I manage this complex wave of emotions?' (interpreting team signals). Participants provided unique recommendations, including patient participation during safety checkpoints, communication protocols, education and raised awareness of patients' needs during minimalist TAVI.

Conclusions: The rapid emergence of minimalist approaches for the treatment of valvular heart disease warrants tailored strategies to integrate patients' needs. Further research is needed to ensure the adoption of patient-centred practices during TAVI.

Keywords: transcatheter aortic valve replacement, peri-procedure nursing, minimalist approach, anaesthesia, patient experience, qualitative

Introduction

Aortic stenosis (AS) is the most common valvular heart disease in older adults. Disease progression is associated with rapid deterioration, poor quality of life, hospital readmission and potential death – if left untreated, mortality rates are as high as 50 per cent two years from symptom onset[1]. Timely intervention with either surgical aortic valve replacement (SAVR) or transcatheter aortic valve implantation (TAVI) is associated with excellent outcomes. Following multiple clinical trials comparing both strategies across surgical risk profiles, TAVI has been endorsed by international clinical guidelines in light of clinical outcomes, evidence of accelerated recovery, improved health-related quality of life and longitudinal data[2,3].

Increasingly, the adoption of shared decision-making in the treatment of valvular heart disease is changing the conversation between patients and clinicians by considering patients' values, priorities and preferences to achieve a high-quality treatment decision[4]. Consequently, the number of TAVIs performed has grown markedly and the transcatheter approach has become the dominant treatment option for AS in multiple regions[5,6]. This paradigm shift has rapidly impacted teams performing cardiac procedures and called on clinical programs to adapt their processes of care to meet the unique needs of older adults undergoing minimally invasive valve implantation.

There is growing evidence to support the implementation of a streamlined clinical pathway to optimise outcomes, improve program capacity and facilitate safe early discharge home after TAVI[7,8]. Significant advances in clinical indications and case selection, imaging, device technology and procedural approaches have had a synergistic effect on increasing the predictability of TAVI[9]. In addition, raised awareness of the risks of in-hospital complications, primarily in older aortic stenosis patients, has prompted clinical teams to implement interventions and standardised clinical pathways to mitigate risks of functional deconditioning, delirium and other iatrogenic events[10]. Together, these changes in practice have prompted a shift from the early focus on 'how we do TAVI' to 'how we care for TAVI patients' to improve clinical outcomes and patients' experiences, increase program capacity and access to care, and reduce costs.

Adopting a minimalist approach to TAVI has accelerated the rapid transition from using general anaesthesia to using less invasive strategies ranging from conscious sedation to local anaesthesia only[11]. The increased use of the cardiac catheter laboratory (CCL), in addition to or instead of hybrid operating rooms (HOR), has modified staffing models for procedures and required merging of perioperative nursing and interventional cardiology nursing competencies[12]. The adoption of these innovative practices reflects the uptake of rapidly evolving contemporary evidence and the aim of minimising patients' physiological stressors, while in hospital, and facilitating rapid reconditioning and safe early discharge home[12]. The recent pace of change in TAVI procedure practices highlights the importance of evidence, not only to inform nursing practice but also to guide adaptations to clinical care.

In this context, little is known about patients' experiences while undergoing minimalist TAVI. To date, studies of patient-reported outcomes and experiences have focused on aspects of pre-procedure care, including factors influencing patients' treatment decisions and changes in functional status before TAVI[13], and post-procedure outcomes and experiences[14–16]. The lack of research seeking to understand patients' experiences during the procedure (intra-procedural experiences) constitutes a gap in the research; evidence about intra-procedural patient experiences is foundational to multidisciplinary clinical care for patients with valvular heart disease treated with minimally invasive approaches. There is a pressing need to ensure that clinician-driven changes to practice promote improved patient experiences. Thus, the purpose of this study was to explore what could be learned from patients' periprocedural experiences during minimalist transfemoral (TF) TAVI – that is, patients' experiences not only before and after but also during the procedure – to inform multidisciplinary practice.

Methods

Design

We designed a qualitative study to investigate TAVI patients' experiences. The study was carried out in a single centre with a multidisciplinary team, that included periprocedural nurses, implanting physicians, a dedicated anaesthesiologist and allied health professionals, and treated with a streamlined clinical pathway with a goal of safe next-day discharge home.

We used interpretive description as a methodological approach to inform study design, data collection and analysis. Interpretive description is an effective strategy to meet the knowledge needs of applied disciplines and is conducive to generating new ideas and augmenting evidence in clinical practice[17].

Participants and settings

The study was conducted in a high-volume TAVI program in British Columbia, Canada. We invited patients to participate after being placed on the waitlist and prior to the procedure. Patients who were urgent in-patients, required general anesthesia for clinical reasons, or were unable to communicate in English were excluded. We used purposeful sampling to recruit men and women representative of diverse characteristics, including age, co-morbidities and geographical residence. We aimed for a sample size that was sufficient in information power and driven by the needs of the study[18].

Ethical considerations

The study received institutional research ethics approval (H20-03917) and participants provided informed consent. Participants were informed that their participation in the study was voluntary and that they could withdraw from the study at any time.

Data collection

We conducted individual interviews with participants by telephone within the first week after their procedure. Interviews were conducted by the principal investigator (CP) using a semi-structured interview guide (see supplemental material) informed by our team's pilot work and current evidence. Open-ended questions were designed to explore patients' perspectives of their experiences, including their recall of the procedure, interactions with team members, self-reported experiences and the overall care received, as well as to be flexible and allow for a dialogue between the researcher and the participant.

Participants were prompted to provide recommendations for the improvement of multidisciplinary practice. Interviews were audio-recorded, transcribed verbatim, de-identified and checked for accuracy. Patient characteristics, procedural details, and post-procedure outcomes were collected from medical records to describe the population.

Data analysis

In keeping with the principles of interpretive description, data collection and analysis were concurrent. We reviewed the transcripts to ensure we had a strong understanding of the content. Using an inductive thematic approach, we highlighted sections of the data that demonstrated key ideas, relationships between the data and emerging themes.

All transcript data were coded using NVivo™ data management software. Three researchers were involved in coding data (CP, SL, FH). To help organise the data into broader concepts, we grouped codes into larger categories that reflected 'bigger picture' thinking. In keeping with qualitative inquiry, we challenged our understanding of the data by comparing and contrasting the participants' experiences and emerging ideas, categories and themes. Throughout data collection and analysis, research team members met regularly to discuss early findings, suitable analytic approaches and emerging trends in the data.

Results

Participant characteristics, procedural details and post-procedure outcomes

We recruited 15 participants between June and October 2021 – ten men and five women with a mean age of 82 (SD=3.2) years. All participants had severe symptomatic aortic stenosis and presented with one or more comorbidity, including hypertension (n=13, 87%), diabetes mellitus (n=5, 33%), atrial fibrillation (n=4, 27%), severe lung disease (n=3, 20%) and peripheral arterial disease (n=2, 13%). Four participants had previous percutaneous coronary revascularisation and one participant had an existing permanent pacemaker.

The planned TF vascular approach was used for 14 participants; the subclavian artery approach was used for one participant. Procedure locations included the HOR (n=6) and CCL (n=9). Most participants (n=13) received diverse regimens of conscious sedation as follows: remifentanil only (n=5), remifentanil and propofol (n=1), dexmedetomidine only (n=2), dexmedetomidine, ketamine and midazolam (n=2), fentanyl and midazolam (n=1), fentanyl and propofol (n=2). One patient received local anaesthesia only, and the patient who underwent the subclavian procedure received general anaesthesia (n=1). The median procedure times were 102 minutes from patient entry to exit, and 56 minutes from skin puncture to closure. All patients had a successful procedure.

Following the procedure, patients were transferred to the cardiac intensive care unit (n=6) or cardiac short stay and cardiac telemetry units (n=9) based on clinical status and bed availability. There were no reports of significant vascular access, neurological or hemodynamic complications. One patient required cardioversion for the management of new atrial fibrillation and one patient received a new permanent pacemaker on the procedure day to treat a persistent high grade atrioventricular delay.

The median length of stay in hospital was one day, all participants were discharged home, were not readmitted to hospital and were alive 30 days after the procedure. Table 1 is a summary of the participants' characteristics, procedural details and post-procedure outcomes.

Thematic findings

I want to be a member of my heart team during my procedure

An overarching theme emerged of participants feeling that they had an important role to play during their procedure, and a desire to be invited to participate as a member of the team during that time. Participants considered the people in the procedure room who focused on performing their procedure to be members of their heart team and sought to find ways to be included.

Table 1: Participant characteristics, procedural details and 30-day outcomes

Demographic (N=15)			Number of participants (%)
Age in years	83 ± 5.4 (mean, SD)		
Gender	female		5 (33%)
	male		10 (67%)
Medical history	hypertension		13 (87%)
	atrial fibrillation		4 (27%)
	diabetes mellitus		5 (33%)
	severe lung disease		3 (20%)
	peripheral arterial disease		2 (13%)
	previous cerebrovascular accident		2 (13%)
	previous percutaneous coronary intervention		4 (27%)
	previous coronary artery bypass graft surgery		0 (0%)
	left ventricular ejection fraction < 35%		1 (6.7%)
Estimated GFR in millilitres per minute	58 ± 17 (mean, SD)		
Procedural details	Anaesthetic management	general anaesthetic	1 (6.7%)
		conscious sedation	13 (87%)
		local anaesthesia only	1 (6.7%)
	Procedure vascular approach	transfemoral	14 (93%)
		subclavian	1 (6.7%)
	Procedure location	hybrid operating room	6 (40%)
		cardiac catheter laboratory	9 (60%)
In-hospital complications	cardioversion		1 (6.7%)
	pacemaker implantation		1 (6.7%)
30-day outcomes	hospital readmission		0 (0%)
	mortality		0 (0%)

SD = standard deviation
GFR = glomerular filtration rate

This desire for membership of the heart team had three components (see Table 2).

1. Who am I to them? (Situating myself in relation to the team.)
2. How can I be a good patient? (Knowing what is expected of me.)
3. How do I manage this complex wave of emotions? (Interpreting signals from the team.)

Who am I to them?

Participants expressed wanting to situate themselves in relation to the team as they entered an unfamiliar environment, experienced fear of the unknown and found comfort in caring gestures. Participants spoke of wanting to be involved in their care and establish a way to communicate with a group of strangers in the procedure room; however, many participants also spoke about how anxiety, and trying to manage their emotions and expectations, contributed to their difficulty responding and adapting to social cues in an unfamiliar environment. When asked to recall their experience in the procedure room, one participant noted:

> Let's be honest … who wants to go into a room with ten other people and they've all got missions to do something to your body? I mean, that's a very frightening position if you think about it. You can hear people talking … there's an enormous number of people. They're all very gentle and very nice … but you can't really get a handle on what they're doing – the ones that are touching you all the time – what they're doing and why they're doing it. But there are other things going on that you really wonder what it is … anyway, it would be nice to know because you are awake and there's a lot of activity in that room.
>
> *74-year-old male*

Although many participants expressed feeling like outsiders during their procedure, others discussed how meaningful it was to experience moments of connection with members of the team. These participants relayed the importance of having their emotional needs tended to. When asked to reflect on their interactions with staff, one participant noted.

> They acted like they really cared if I lived or died. And who was I to them? But I was something to them. You know what I mean? That's how I felt – very cared for.
>
> *93-year-old female*

How can I be a good patient?

While participants had differing ideas on how to best prepare and make sense of the procedure, most shared a common desire to be informed and guided to comply with the expected behaviours and unspoken rules of the perioperative environment and procedure process. Participants expressed wanting to be perceived as helpful and unproblematic by their heart team, and to do their part by assuming the role of the 'good patient'. When asked about their experience of having their procedure under light sedation, one participant noted:

> The doctor had said to me before I went under, or whatever he was doing, 'don't try and help'. So, I kept quiet … I was wanting to know how it was going but I didn't ask any questions.
>
> *79-year-old female*

Similarly, another participant stated:

> I tried to relax. I didn't want to tense up, 'cause I thought that if I tensed up, I might create a problem that I didn't want to create.
>
> *85-year-old male*

Although participants had varying levels of awareness, they described how being conscious affected their experience. One participant stated:

> I felt I was a little more in control because I was able to hear what they were saying and be aware of what they were [doing] … I certainly didn't find it threatening in any way.
>
> *81-year-old female*

In contrast, another participant stated:

> I don't have pleasant memories of the overall experience … I can't say that that was the most pleasant day of my life. It was maybe one of the scariest in a long time because of the consciousness.
>
> *85-year-old male*

How do I manage this complex wave of emotions?

Participants discussed experiencing a wave of emotions that started while waiting for the procedure when they felt stress associated with uncertainty, crested during the procedure when they sought signals of hope and danger, and released rapidly once TAVI was successfully completed when they suddenly breathed a sigh of relief. When asked to reflect on their experience, one participant spoke of waiting for the procedure:

> The biggest hang-up was the uncertainty of when I was going to get in … that's the kind of thing that ticks you off because you have to change your life. I, in fact, did change my life.
>
> *74-year-old male*

During the procedure, participants remained vigilant for signs of potential danger and sought signals indicating the progress of their procedure. One participant recalled:

> Perhaps 20 minutes in, they said 'we got a problem here'. I heard that phrase, starkly, and that struck me a little … you know, these guys got a problem with me or, what's going to happen here? … that shook me a little bit.
>
> *85-year-old male*

The same participant shared their experience of feeling emotionally and physically exhausted during TAVI but also the significant wave of relief they felt after hearing confirmation that their procedure was a success.

> [I thought] I hope these guys finish quick because I'm not going to be able to hold on here much longer. But as it turned out … the specialist said … 'you've got a new valve'. And I was just elated. I was so excited underneath all that stress and everything. And that phrase was all I needed to get me really happy.
>
> *85-year-old-male*

Although participants did not verbalise the impact of these signals in the moment, they related how meaningful and memorable these small gestures were at the time and how those gestures helped anchor their wave of emotion.

Table 2 summarises the themes and subthemes that emerged and gives exemplar quotes.

Discussion

This novel study adds new evidence to better understand patients' experiences of TAVI and inform multidisciplinary care. In this exploratory qualitative study, we found that patients expressed a need or desire to be part of the procedural team as they sought relational contact with clinicians, tried to meet expectations of how to act and respond, and navigated a range of emotions during the short but intense procedure. To our knowledge, this is the first study focused on integrating patients' self-reported experiences and eliciting their recommendations in the context of the rapid evolution of streamlined, minimalist transcatheter heart valve procedures.

Evolution of anaesthesia strategies

In the early years of TAVI general anaesthesia was used. This was prompted by not only conventional surgical practices but also concerns for patient safety and comfort and the need to manage potential complications, including hemodynamic instability and vascular injury. In a period of rapid change in practice during 2014 and 2015, overall use of conscious sedation – defined as 'a drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation' – increased from 11 per cent to nearly 30 per cent across 314 hospitals in the United States of America (USA). Between 2016 and 2019, the use of conscious sedation in the USA further increased from 33 per cent to 64 per cent.[11]

In 2017, the safety of TAVI with conscious sedation was examined across a high-volume of procedures and reported in the Society of Thoracic Surgeons / American College of Cardiology TVT Registry. Similar findings were reported in the German Aortic Valve Registry (GARY), where local anaesthesia or conscious sedation was used in 49 per cent of cases from 2011 to 2014[19], and the FRANCE TAVI Registry which reported an increase from 31.3 per cent to 48.3 per cent between 2010 and 2015[20].

This temporal trend in practice change persists across regions. Studies continue to demonstrate not only the safety of conscious sedation across TAVI risk profiles but also an association with shorter procedure times, reduced inotrope requirements and delirium, shorter lengths of stay in intensive care and hospital, predictable time to early mobilisation and lower costs, with no difference in clinical outcomes[21–23] Importantly, most studies lack granular data to address anaesthesia services' consideration of the risks of obstructive sleep apnoea, difficult airway or high baseline pain medication requirements, or parse the effect of the wide variation along the sedation continuum[14].

More recently, single centres have reported transitioning from a monitored anaesthesia care service model (regardless of the depth of sedation provided) to a 'monitored nursing care' or 'nurse-led sedation/analgesia' delivery model for select patients. This transition results from various factors, including ongoing evolution of the procedure, with the adoption of a default strategy of local anaesthesia with or without very minimal sedation, and competing demands placed on local anaesthesia services[24,25]. The heterogeneity in practice reported across regions and centres highlights the pressing need for further research to better understand patients' perspectives to augment current evidence in this rapidly evolving context.

Strengthening patients' role on the heart team

The concept of the multidisciplinary team (MDT) emerged in the early years of TAVI to leverage the collective expertise of cardiology and cardiac surgery to guide treatment decisions[26]. Over time, membership on the team has expanded to other specialised services, including cardiac imaging, anaesthesia services and nursing.

Table 2: Themes, sub-themes and exemplar quotes

Overarching theme: I want to be a member of my heart team during my procedure		
Theme	**Sub-themes**	**Exemplar quotes**
Who am I to them?	Entering an unfamiliar environment	Let's be honest … who wants to go into a room with ten other people and they've all got missions to do something to your body? I mean, that's a very frightening position if you think about it. *74-year-old male*
	Experiencing fear of the unknown	I was trying to fight the operation itself, symbolically, like not really mechanically … I was in my mind fighting this thing and saying, I don't want this thing to hurt … I was frightened that I would feel the catheter and the wires protruding into my body and going bump, bump, bump … I was as scared as could be. *85-year-old male*
	Finding comfort in caring gestures	They acted like they really cared if I lived or died. And who was I to them? But I was something to them. You know what I mean? That's how I felt – very cared for. *93-year-old female*
How can I be a good patient?	Making sense of TAVI	It's almost overkill … they give you an enormous amount of information … it's probably too much because it starts to repeat itself as a little bit different so you're never sure which thing to look at. Like, there's quite a pile … little books and they're not all the same because I guess they were written at different times and some have some things that others don't. *76-year-old male*
	Seeking guidance on behavioural expectations	The doctor had said to me before I went under, or whatever he was doing, 'don't try and help'. So, I kept quiet … I was wanting to know how it was going but I didn't ask any questions. *79-year-old female* I tried to relax. I didn't want to tense up, 'cause I thought that if I tensed up, I might create a problem that I didn't want to create. *85-year-old male*
	Relating procedural awareness to overall experience	I felt I was a little more in control because I was able to hear what they were saying and be aware of what they were [doing] … I certainly didn't find it threatening in any way. *81-year-old female* The idea of jabs and dental freezing scared me a lot, and when I was on the operating table itself … I was still fighting [the procedure] metaphorically … if I was knocked out … off in dreamland somewhere, that would've been nice. *85-year-old male*
How do I manage this complex wave of emotions?	Experiencing anticipatory stress	Death, I had that on my mind, I got to admit. Like, the night before I was wondering if they asked for a living will for heaven's sake and they asked for a priest … if they're doing that, they've got some reason to suspect maybe something's gonna go wrong here, you know? *85-year-old male*
	Tuning into signals of hope and danger	Perhaps 20 minutes in, they said 'we got a problem here'. I heard that phrase, starkly, and that struck me a little … you know, these guys got a problem with me or, what's going to happen here? … that shook me a little bit. *85-year-old male* It was an hour or a bit more into it and I kind of caught the eye of one of the surgeons that was assisting, and he gave me a thumbs up, more or less to say it's going well … so I thought that was nice. *75-year-old male*
	Breathing a sigh of relief	… the specialist said … 'you've got a new valve'. And I was just elated. I was so excited underneath all that stress and everything. And that phrase was all I needed to get me really happy. *85-year-old-male*

Access to a comprehensive and expert MDT has been integrated across international guidelines for the management of valvular heart disease, and has been credited with improving outcomes and sustaining excellent results and health service delivery models[27]. Our findings suggest that patients perceive that they have a role to play on their heart team, and are seeking guidance to be competent, engaged and coached participants during the implant procedure.

The shift of culture from clinician-focused to patient-centred health care continues to be a priority when striving to achieve the quintuple aim of improved outcomes, better patient and provider experiences, equitable access to care and decreased costs[28]. Our findings suggest the importance of raising the team's awareness of patients' communication needs and experiences of being conscious during the procedure. In the surgical environment, caring for conscious patients remains a relatively new and under-researched practice.

Whether TAVI is performed in interventional cardiology or cardiac surgery procedure rooms, the shift to patient-centred care can be supported by strategies such as the repeated use of the patient and clinicians' names during interactions, patient participation during surgery checklist time out procedures[29], effective coaching at pivotal times (e.g. vascular access, valve deployment), distraction interventions[30] and communication of procedure progress[31]. These strategies may be effective in meeting patient communication needs and creating a standard of care to ensure consistently excellent patient interactions. Although our findings are a start to understanding how to optimise patients' periprocedural experiences, research is needed to further explore interventions to mitigate the risks of discomfort, anxiety or other preventable adverse patient-reported outcomes.

The early and consistent management of patients' expectations is essential to strengthening their active participation during TAVI. In the same way that patient education, early discharge planning and standardisation of clinical pathways contribute to achieving safe, standard, next-day discharge home[7,32], patient engagement and team communication about procedural practices and expected timepoints are effective strategies to strengthen the patient–MDT partnership and improve patients' experiences.

Tailored education resources, consistent communication from all disciplines, and on-going assessment of individual needs can reinforce the predictability of contemporary minimalist TAVI; focused attention on patient comfort and safety is required to achieve this goal. In this setting, the expertise of perioperative and interventional cardiology nurses is ideally suited to strengthen patients' effective participation in their procedure and promote positive outcomes. Figure 1 provides a summary of recommendations for integrating patients' perspectives during TAVI.

Limitations

Participants were recruited from a single TAVI clinic in Western Canada with well-established standardised practices. Although the recruitment goal was to ensure diversity and inclusion, the results may not accurately reflect the experiences of participants in other TAVI programs, especially given the impact of local contexts of care, multidisciplinary practice and care processes. Findings should be interpreted in light of the study design and sample.

Conclusion

We aimed to explore patients' perspectives of their experiences during the TAVI procedure to determine what could be learned to inform care. We have reported novel findings that can help guide and modify interventions to support patients to become members of their procedure team and improve their care experience. We identified opportunities for nurses and other members of the MDT to leverage their expertise and competencies to achieve this goal. Future research is needed to explore the development of standardised care interventions to help enhance patients' experiences and further synchronise patient-reported outcomes and experiences with the evolution of TAVI practices. This work is essential to support the rapid expansion of transcatheter heart valve treatment options and contribute to shifting the culture of care from clinician-focused to patient-centred, especially during intense and impactful procedures.

Acknowledgements

The authors thank Jopie Polderman and Leslie Achtem of St Paul's Hospital, Vancouver, Canada, for their support for research activities.

Conflict of interest declaration

SB Lauck has been a consultant to Edwards and Medtronic. J Sathananthan has been a consultant to Edwards, Medtronic and Boston Scientific, and has received research grants from Edwards and Medtronic. DA Wood has received research grants from Abbott and Edwards. JG Webb has been a consultant and/or received research support from Edwards, Abbott, Boston Scientific and Vivitro Medical.

Pre-procedural patient education	Provide orientation to procedure location, team, steps and duration to clarify expectations using multi-modality and individualised teaching methods.
Pre-procedural patient assessment	Screen for: • risk of excessive periprocedural anxiety (e.g. history of anxiety disorder, past negative procedural experience) • barriers to communication (e.g. language, sensory challenges).
Health care team education	Share updates on contemporary evidence about TAVI anaesthesia strategy and implications of caring for conscious patients. Tailor education to hybrid operating room and cardiac catheter laboratory teams and environments.
Periprocedural protocol	Consider including the following interventions: ✓ identifying barriers to communication ✓ addressing patient and team members by name ✓ including patient in safety checklist and procedural time-outs ✓ designating a 'most responsible provider' to communicate with patient ✓ raising awareness about care of the conscious patient ✓ highlighting patient preferences
Communication of TAVI main time points to patient	Patient preparation and draping > Local anaesthesia and puncture > Start of implant procedure > Rapid pacing and implantation > End of implantation > Vascular closure
Communication of patient's periprocedural role	Provide direction to encourage patient to: ✓ voice discomfort or other issues ✓ remain still at critical moments (e.g. rapid pacing and device deployment).

Figure 1: Summary of recommendations for integrating patients' perspectives and improving patient's periprocedural experiences

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‘I want to be a member of my heart team’: Insights from patients’ experiences of minimalist transcatheter aortic valve implantation

Supplement: Interview guide for semi-structured interviews with patients

Section A: Pre-operative care

1. I’m wondering if you could tell me a bit about your experience with aortic stenosis leading up to your TAVI procedure?
2. Before you had the TAVI procedure, how well do you think you understood what was going to happen?
3. How comfortable were you with your understanding of the type of anaesthesia?
    a. How did you feel about the idea of being awake for the procedure?
    b. How well prepared do you think you were for the procedure?
    c. What were you still unclear on about the procedure before having it?
    d. Could you provide specific examples of what was most helpful in preparing for your procedure?

Section B: Intra-operative care

1. Can you tell me about your experience during the procedure and what it was like for you?
    a. What were your experiences with comfort and pain?
    b. Could you share with me some of your thoughts throughout the procedure?
2. Can you tell me about your experience of being awake for the procedure?
    a. Can you tell me about the sounds in the procedure room?
    b. Can you tell me about the sensations you experienced? E.g. at the start of your procedure, when your heart was being sped up by a pacemaker, during the placement of your new valve.
3. Can you describe your interactions with the health care providers?
    a. Can you tell me about your experiences with staff during the procedure?
    b. Can you describe to me what stood out about the care you received during your procedure?
4. Can you tell me what was most important to you during your procedure?
    a. What was your main concern?
    b. Can you tell me about your experience in the procedure room in relation to your concerns being met or validated?

Section C: Post-operative care

1. Can you tell me about the care you received immediately following your procedure in the hospital?
    a. How comfortable were you with the teaching you received post-operatively?
    b. How comfortable were you with the idea of returning home following your procedure?
2. What recommendations would you have for the care team to enhance the patient experience during TAVI?
    a. Is there anything you would have liked to see done differently?
    b. Would you recommend the procedure to others?
3. What recommendations would you have for other people who might have TAVI?