We know how vital Queensland's heart and lung transplant services are to patients and families across the state and beyond. We take our responsibility to deliver safe high-quality care seriously.

This responsibility demands accountability and transparency to instil public confidence. Last year we commissioned a benchmarking exercise of Queensland Heart and Lung Transplant Services, based at The Prince Charles Hospital, to identify opportunities to strengthen and improve service delivery.

Aspects of the report were extremely concerning and we apologise for any distress this causes to patients, staff, donor families and the broader community.

Metro North accepts the findings and recommendations from the report and is committed to continuously improving our transplant services.

The report provided positive feedback about the lung transplant service, with strong leadership, a cohesive team and outcomes clearly exceeding international benchmarks as noted by the reviewers.

However, we do acknowledge that a number of very significant issues were identified with the heart transplant service which needed urgent attention.

We have a responsibility to address all the issues identified in a timely manner and part of this response is to ensure transparency and openness with our patients, clinicians and the broader community so we can rebuild trust in our services.

We are therefore sharing a redacted version of the benchmarking report that has been approved for release by the Queensland Information Commissioner (QIC). You will see sections and phrases have been redacted for legal reasons. This is to ensure we uphold our requirements to protect the privacy of patients and staff, but we can assure you the issues outlined in these sections have or are being addressed.

Since receiving the report Metro North has commenced implementation of the 43 recommendations. To date, 34 have been completed and the remaining 9 are in progress. These includes a significant additional financial investment (nearly $8 million recurrently) to increase staffing, aligning our donor criteria to national standards, and improvements in reporting for greater transparency. The service is already seeing a noticeable difference, particularly in the culture of our heart transplant service. This is a recognition of the hard work of our current clinical staff in the transplant service, who have our full support.

We are proud of all staff for their commitment to implement the recommendations from the report and improve transplant services.

Since 2016, the lung program has delivered more than 300 transplants, achieving a one-year survival rate of approximately 90 per cent and a median survival of 9 years. This is well above the international average.

The heart service continues to perform strongly, with a longitudinal one-year survival rate of 87 per cent and long-term survival of 55 per cent at 12 years. In addition, the number of heart transplants undertaken has increased significantly since 2023.

Both transplant programs are delivering safe surgical services and excellent outcomes and we are confident that services will continue to improve as further recommendations are implemented.

Behind every number are donor families and transplant recipients placing their trust in our care. These results reflect the high level of skill, compassion and commitment of the staff who walk with each patient through one of medicine's most demanding journeys, and our commitment to supporting them.

We would like to thank our patients, donor families and community for their support and trust. Providing a second chance at life is not a responsibility we take lightly. We also thank our staff for their commitment and willingness to improve the services, as highlighted in the report, while continuing to undertake this highly complex clinical work.

We remain committed to being open and transparent with our consumers and supporting our clinicians to make further improvements to ensure we provide world class transplant services into the future.

Bernard Curran, Board Chair, Metro North Hospital and Health Board

Nick Steele, Acting Chief Executive, Metro North Hospital and Health Service

External Benchmarking Exercise:

TPCH Heart and Lung Transplant Services

Reviewers:

Sch4 Pt3 No 3

, Alfred Hospital, Melbourne

Sch4 Pt3 No 3

, Alfred Hospital, Melbourne

Sch4 Pt3 No 3

, St Vincent's Hospital, Sydney

Sch4 Pt3 No 3

Peter MacCallum Cancer Centre, Melbourne

Sch4 Pt3 No 3

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Alfred Hospital, Melbourne

Sch4 Pt3 No 3

Fiona Stanley Hospital, Perth

Sch4 Pt3 No 3

Sch4 Pt3 No 3

St Vincent's Hospital, Sydney

Introduction and overview

As external Reviewers, we were recruited by The Prince Charles Hospital (TPCH) and tasked to 'review the current transplant services to identify strengths and opportunities for improvement'. The aim was for us to 'produce a report with recommendations for improvement based on the scope of the exercise'.

The selected Reviewers covered advanced practice cardiothoracic transplant nursing, heart transplant and heart failure medicine, lung transplant and lung failure medicine, cardiothoracic transplantation and general cardiothoracic surgery. The individuals each had on average over 3 decades of experience of transplantation hospital medicine to draw on.

The comments and recommendations below are derived largely from conversations with a wide range of TPCH staff. The majority of these 35 key staff members were interviewed by the team over 3 days at TPCH. A portion of these staff were recalled then for re-interview, another portion were re-interviewed a week later specifically from a surgical perspective and a small portion were sought out separately in the weeks following the TPCH site visit. Some briefing notes were provided by the Transplant Service team and some via the interviewees.

It is important to note we asked the interviewees to be frank and honest about the challenges they faced and the improvements they wished to see enacted. We promised that our report would not, where at all possible, divulge the names of specific individuals. Indeed, we feel the background leading to our final recommendations should remain highly confidential to protect individual staff member's well-being. Sch4 Pt4 No 4 (Recommendation 1).

Our ability to cross-check specific challenges across different people and different teams gives us some level of confidence that we were identifying legitimate issues. An absolute positive was the clear levels of passion and professional interest in seeking real change. The vast majority of staff were genuinely looking to us, by our report and via the TPCH Executive, to bring about real solutions. Staff specifically did not want the Heart Transplant Service to close, an undertaking to which all Reviewers were committed. (Recommendation 2).

Sch4 Pt3 No 3

It became rapidly apparent those interviewed were describing challenges that affect hundreds of TPCH staff directly and indirectly, as well as several thousand past, present and future TCPH patients. There are clear current and future organisational risks. Immediate consideration must be given to protect patients, staff and reputations. We also note the current media and governmental interest in high profile Queensland (QLD) health issues.

Heart Transplant Service

Based on QLD population demographics, and the performance of interstate programs, the review concluded that the Heart Transplant Service was underservicing the QLD population. In a program that should be performing 20-25 heart transplants per year, the average is half this number. Representatives from Donate Life Queensland reported that in 2023, 50% of Queensland donor heart offers were referred and transplanted interstate. TPCH reasons for declining these offers included:

not medically suitable (either marginal brain-death donor or donation after circulatory-death donor), or no-suitable recipient.

Declining a significant number of donor heart offers on the grounds that they were not medically suitable, when they were then transplanted successfully by other programs, indicates a very conservative donor selection policy. The Reviewers concluded that this conservatism was Sch4 Pt3 No 3 coupled with the lack of machine perfusion technology, despite having invested in this previously (Transmedics Organ Care System = OCS).

The frequent occurrence of no-suitable recipient was due to the surprisingly small waiting list for heart transplantation. At the time of the review, only 10 patients were actively listed for heart transplant and only 5 heart transplants had been performed in the year to date. There appear to be several factors contributing to patients being delayed while navigating their assessments and actually making it onto this small waiting list (Recommendation 3).

There can be delay in the listing of patients for heart transplantation due to limited access to other specialty services. Patients being worked up for heart transplantation often have co-morbidities that require input from other specialties including Dental, Renal, Gastroenterology, Endocrine and Haematology. These services are either not available on site or very limited relying on Medical Officers from other hospitals.

Further unnecessary delays also occur as a result of the Sch4 Pt3 No 3 between the heart transplant cardiologists and transplant surgeons. Although there is a weekly Thursday morning meeting to discuss patients who are to be listed for heart or lung transplantation, it was reported that the cardiologists usually attended via zoom (even though the meeting room was just down the corridor) and that the attendance Sch4 Pt3 No 3 was poor Sch4 Pt3 No 3 In contrast, the transplant meeting was well attended by the lung transplant physicians and surgeons with most attendees face-to-face in the room. Non-attendance by the patient's heart transplant cardiologist or surgeon can lead to unnecessary delays often by up to a month or more in listing of patients for heart transplantation (Recommendation 4). This commonly left patients feeling anxious regarding their suitability for heart transplantation.

Unnecessary delay in listing patients for heart transplantation also follows Sch4 Pt3 No 3 that patients be withdrawn from Entresto and SGLT2 inhibitors before being placed on the active waiting list. There is no medical justification for removal of these drugs (which constitute 2 of the 4 pillars of chronic heart failure therapy) in patients with advanced heart failure who have been stabilised on these drugs. Withdrawal of these drugs can lead to acute decompensation and further deterioration in their condition before they are actively transplanted, as evidenced by the re-admission of Sch4 Pt3 No 3 in '09- Multi-disciplinary Team (MDT) meeting minutes Sch4 Pt3 No 3 Heart Tx Deidentified'.

Sch4 Pt3 No 3

(Recommendation 5 & Recommendation 15 in Cardiothoracic Transplant Surgery section below).

Concern was also expressed Sch4 Pt3 No 3 regarding heart transplant outcomes. The Cardiology Department has monthly Morbidity and Mortality Meetings. It has been repeatedly requested that the Heart Transplant Service present their data, but Sch4 Pt3 No 3 It is noteworthy that whereas the Lung Transplant Service provided the Committee with a Kaplan-Meier survival curve of recipient survival post-lung transplant [with excellent outcomes compared to the ISHLT (International Society for Heart and Lung Transplantation) benchmark], the Heart Transplant survival data was provided as a Table with raw numbers of transplants and deaths for each year of the program. Over the 25-year period from 1998 to 2023 the TPCH Heart Transplant Service performed 314 heart transplants. A review of this Table for the last 5 years where data is complete (2018-2022), shows that 15 of 71 heart transplant recipients (21%) died within the first year after transplantation. This compares with a 14% mortality at one-year post-heart transplant for adult recipients reported by the ISHLT in its Registry Report JHLT 2021;40: 1023-72 (Recommendation 6 and 7).

The Reviewers requested a detailed heart transplant perioperative management protocol (including haemodynamic management, immunosuppression and anti-infective strategies). A draft protocol was provided to the Reviewers one week after it was requested (in contrast to the equivalent lung transplant protocol that was provided immediately on request). Although the heart protocol was initially drafted some 15 years ago and has been periodically updated, it appears that it has never been ratified since it had extensive tracking changes and unresolved comments – Sch4 Pt3 No 3 (Recommendation 7).

There are currently heart transplantation/heart failure cardiologists: Sch4 Pt3 No 3 The Reviewers understand there is funding for an additional 1.0 FTE cardiologist however, apparently no suitable applicant was identified after the position was advertised earlier this year.

Sch4 Pt3 No 3 cardiologists are hard-working but they are stressed and 'stretched too thin'. Sch4 Pt3 No 3

Appointment of an additional cardiologist dedicated to heart transplantation should go some way towards resolving this issue (Recommendation 8).

The Sch4 Pt3 No 3 between the heart transplant cardiologists and heart transplant surgeons described above also appears to exist between the heart transplant cardiologists and Intensive Care Unit (ICU) specialists. Sch4 Pt3 No 3 The lack of senior ICU physician presence in the ICU 'after hours' was highlighted by both heart transplant cardiologists and cardiothoracic surgeons (and lung physicians) as a major deficiency in the service especially given the complexities of patients that they deal with (Recommendation 9 and 10).

Sch4 Pt3 No 3

Sch4 Pt3 No 3

Approximately 1200 heart failure patients are being followed by the Advanced Heart Failure and Heart Transplant Service with clinics on Tuesdays and Thursdays, however on average only 45 are assessed each year for advanced heart failure therapies (Recommendation 11). At present, there are only 10 patients on the active heart transplant waiting list, of which 5 have an LVAD out of the current 15 LVAD supported patients.

Feedback from consumer representatives about the performance of the outpatient Heart Transplant Service was also highly critical. A marked difference was noted between lung and heart outpatient services. The Lung Transplant Service clinicians (medical, nursing) are seen as more approachable with timely responses to patient email enquiries. The heart program is seen as being staffed by overworked and highly stressed clinicians. When one patient rang the heart outpatient clinic and asked 'is this a good time to call?', the reply received was that 'there is never a good time to call – if you have a problem see your General Practitioner or go to the Emergency Department'. Consumers reported that patient enquiries to their email service basically went unanswered (See Recommendations in the Nursing Services section below).

The exception in the Heart Transplant Service is the Mechanical Circulatory Support (MCS) clinic, where there is perceived to be excellent and frequent follow-up. The follow-up of MCS supported patients contrasts with that of non-MCS supported patients who are on the waiting list for heart transplant. The latter are seen less frequently and occasionally feel like they have been largely forgotten. Of note, Sch4 Pt3 No 3 in the Heart Transplant Service was extremely distressed on hearing this specific group of patients were complaining of being forgotten- reporting that their nursing team go out of their way to ensure all waiting-list patients are adequately reviewed despite the overall lack of resourcing. This likely reflects inadequate staff FTE to ensure the increasing size and complexity of the heart transplant cohort is accommodated. Furthermore, it was unclear when the last increase in nursing FTE for the service occurred.

Procedures that are intrinsic to the Heart Transplant Service i.e., right heart catheterisation (RHC) and endomyocardial biopsies (EMBx) are being performed well by the heart transplant clinicians, however the Reviewers noted that the performance of RHC 3 monthly in patients actively listed for heart transplantation, regardless of the previous result Sch4 Pt3 No 3 was clinically unnecessary and created yet more work for the heart transplant cardiologists.

Sch4 Pt3 No 3

Sch4 Pt3 No 3

Lung Transplant Service

The Lung Transplant Service presented as a more cohesive team Sch4 Pt3 No 3 . Excellent perioperative management protocols and clear outcome data were produced by the Lung Transplant Service.

A small group of consumers contrasted the heart and lung service's support and processes as 'chalk and cheese' compared to those of Heart Transplant Service.

At 25 lung transplants in 2023, the number of transplants performed was lower than expected per million population, with approximately 50% of all QLD's retrieved lungs being transplanted in southern states. Fifteen lung transplants have been performed in the first 6 months of 2024. Eleven patients are currently wait listed, which is also lower than expected, and partially explains the lower resultant transplant numbers. It is noted that a relatively conservative approach to recipient selection results in a number of potential QLD recipients referred on by their physicians to southern states or overseas for transplants (e.g. 3-5 per year to Victoria).

The Lung Transplant Service's medical-surgical interactions (meetings, clinical interactions etc) and staffing numbers seemed generally appropriate, with exceptions in nursing and allied health components. In particular, concerns were raised about the sustainability of the retrieval service medical and coordinator staffing. The retrieval nursing coordinator and scrub roles and appropriate rostering and support requires attention in this regard (Recommendation 12, 13, 14 and further Recommendations in Nursing Services section below).

Surgical lung transplant consultant rostering at 1 in 3 was mentioned as a challenge, although the contributions of Private-surgical versus Public-TPCH transplant cover and workload was not clear. Despite owning an Ex-vivo lung perfusion machine, perfusion of lungs was seen as too labour intensive for staff.

Interactions with ICU were not ideal, Sch4 Pt3 No 3 and a lack of evening and overnight senior medical staff on-site support. Physicians reported that the ICU invariably used groin cannulation access for Veno-venous Extra Corporeal Membrane Oxygenation (VV-ECMO) that precludes ambulation, verses a more contemporary access strategy such as Avalon cannulation (Recommendation 9). Physicians were keen to see more lung transplant cases performed through a thoracotomy approach, without the use of cardiopulmonary bypass, as a way to avoid surgical bleeding complications (Recommendation 15 in Cardiothoracic Transplant Surgery section).

The Lung Transplant Service expressed the wish that they be assessed and recommendations made separately from the Heart Transplant Service in the Reviewer's report since they felt that the Heart

Transplant Service had significant leadership (medical), team, resource and role issues. The Reviewers agree that the lung team should not be depleted of resources to reinforce the heart team (Recommendation 14).

Cardiothoracic Transplant Surgery

Sch4 Pt3 No 3

- ICU staff provide a particularly valuable and unique perspective because of the critical role they play in the triage of high surgical risk patients and in their immediate post-operative care.

Sch4 Pt3 No 3

Sch4 Pt3 No 3

(Recommendation 15).

Sch4 Pt3 No 3

As noted above, there is a paucity of engagement of the Heart Transplant Service in audit and patient outcome reviews as routinely practiced in other heart transplant centres. The heart transplant surgeons do not attend the listing meeting (or very rarely), although the Reviewers understand this

may have changed recently Sch4 Pt3 No 3 (Recommendation 4).

The Cardiothoracic Surgical Department has essentially no academic or research profile despite the Critical Care Research Group (CCRG) directed by [redacted] being on site. The CCRG is hugely productive academically and scientifically. The CCRG carried out much of the basic science underpinning hypothermic oxygenated perfusion of donor hearts and participation in these experiments that went on for about 5 years was offered to the department on multiple occasions, but Sch4 Pt3 No 3 Cardiac Surgery at Princess Alexandra Hospital, ultimately provided a registrar. Furthermore, TPCH was the only transplant centre in Australia and New Zealand to not participate in the subsequent Australia/New Zealand trial of Hypothermic Oxygenated Perfusion of donor hearts, a trial that has garnered considerable worldwide attention. This method of donor heart preservation is now standard of care in Australia and New Zealand for donor heart preservation for prolonged ischemic times and this technology is currently not available at TPCH. The decision to not participate in the trial Sch4 Pt3 no.3 (Recommendation 15, 16, 17 and 19).

Sch4 Pt3 No 3

(Recommendation 2, 3, 5 and 8).

In contrast to the cardiac transplant program, the Lung Transplant Service impresses as a well-run program with good team morale. There is mutual respect between the lung transplant surgeons and pulmonologists. The Lung Transplant Service Sch4 Pt3 No 3 who is respected throughout the hospital and by surgeons as a talented and effective Sch4 Pt3 No 3 done an outstanding job with the program. The lung transplant physicians are a cohesive group with good relationships within the group. The lung transplant surgeons routinely attend the listing meeting. The Lung Transplant Service has an audit every 2 months, discuss deaths in detail and are very aware of the 12-month lung transplant survival curve. This is in contradistinction to the Heart Transplant Service where audits are infrequent (as previously noted).

It was noted that all lung transplants at TPCH are performed through a sternotomy on cardiopulmonary bypass which largely has been replaced internationally by a technique using small thoracotomy incisions and without cardiopulmonary bypass, except in certain circumstances (Recommendation 18 and 19). Surgical plans to move in this direction were interrupted by the COVID pandemic, but the surgeons should now reactivate plans to train in this technique. There were plans for surgeons to train overseas, but that is really not necessary since this training could easily be obtained from other lung transplant programs in Australia without the necessity for prolonged sabbaticals in an overseas lung transplant unit.

Both the heart and lung transplant surgeons feel that the on-call for transplantation is onerous and they need more surgeons. However, given the small number of transplants being performed, this

perceived need for more surgeons may be more related to the level of commitment to the private rather than the public system (Recommendation 12 and 13).

The donor organ (both heart and lung) procurement service is unsustainable with only 2 surgeons on the procurement roster, Sch4 Pt3 No 3 (Recommendation 13).

Sch4 Pt3 No 3 . For that reason, the Reviewers think that the repair process requires new appointments at both ends of this fractured relationship. To some extent, the same could be said Sch4 Pt3 No 3 between ICU and the heart failure/cardiac transplant cardiology group. A Cardiothoracic Surgeon should lead thoracic transplant surgery and MCS to direct the surgical program from within the Department of Cardiothoracic Surgery (Recommendation 19). Furthermore, it is the opinion of the Reviewers that in view of the Sch4 Pt3 No 3 ICU should be appointed to repair the relationship at the other end (Recommendation 9). It is the Reviewers' suggestion that an individual such as Sch4 Pt3 No 3 could be approached by TPCH administration to play a role in the process of restoration of the fractured ICU relations with surgery and heart failure consultants.

Anaesthesia

Sch4 Pt3 No 3 the department had no academic, college, state-wide engagement Sch4 Pt3 No 3 While these activities were not overtly discouraged, they were Sch4 Pt3 No 3 not supported. Sch4 Pt3 No 3 rebuild the department from a very low base with respect to engagement within the hospital, academically, educationally, with state-wide committees and the college. The standard of clinical work is very good. As the department struggled to develop Sch4 Pt3 No 3 anaesthesiologists left the department, or reduced their commitment Sch4 Pt3 No 3 currently attempting to reverse this very difficult situation. Sch4 Pt3 No 3 encouraging and recruiting anaesthesiologists who wish to pursue higher degrees. It is of concern to the Reviewers that this situation Sch4 Pt3 No 3 was known about for years by the administration and never addressed.

Because there is such a low number of transplants relative to the number of anaesthesiologists on call for these procedures, a considerable period of time may elapse between the times that an individual anaesthesiologist may do a transplant case. Sch4 Pt3 No 3 It has also been expressed that it is very hard to attract anaesthesiologists to a department that is "not flying high". That particularly applies to the recruitment of anaesthesiologists with transplant experience although Sch4 Pt3 No 3 whilst encouraging staff to do short sabbaticals in a major transplant centre, Sch4 Pt3 No 3 transplant anaesthesia training "on the job" is a viable option.

With respect to the issues facing the Heart Transplant Service, the Sch4 Pt3 No 3 are well aware of the difficulties, but have limited involvement with this service except for the operative period of the transplant. Sch4 Pt3 No 3 lack of collegiality and poor interactions between surgeons, ICU and the cardiologists. Sch4 Pt3 No 3 It is very rare for the heart transplant surgeons to go to transplant listing meeting (Recommendation 4 and 19).

Sch4 Pt3 No 3 have concerns about the implementation of donor heart preservation technology. The Transmedics-OCS system was purchased and has not been used in years. The surrounding the XVIVO Hypothermic Oxygenated Perfusion (HOPE) system is another example. Much of the basic science underpinning HOPE was done by the Critical Care Research Group Sch4 Pt3 No 3 Given the results of the trial and the worldwide interest in HOPE, the Heart Transplant Service would now like to use this technology. A meeting was scheduled to discuss the procurement of the XVIVO technology, but the perfusion department was not involved in the meeting, the very group that would be involved in running the technology (Recommendation 13, 16, 17 and 19).

Sch4 Pt3 No 3

(Recommendations 4, 5, 6, 7 and 8).

- Sch4 Pt3 No 3 SGLT drugs and Entresto stopped prior to transplantation for reasons that do not seem to be grounded in evidence (Recommendation 15).

In contrast to the Heart Transplant Service, the Lung Transplant Service physicians are respected and Sch4 Pt3 No 3 is described as an outstanding leader and the Service is working well Sch4 Pt3 No 3 The lung transplant surgeons do attend the lung transplant listing meeting.

Perfusion Service

Currently, there are 7 perfusionists in the department, Sch4 Pt3 No 3

Consequently, the department needs to recruit trainee perfusionists, or plan for recruitment of experienced perfusionists and a succession plan for a lead perfusionist.

The concerns the Reviewers heard were primarily related to technology. Ex Vivo Lung Perfusion (EVLP) was last used November 2023 and perfusionists were involved. Donor lungs that previously underwent EVLP are now transplanted without assessment. The Transmedics OCS heart system has not been used since 2022. Its use was not sustainable, as it relied only on the goodwill of perfusion staff. There was no on-call schedule for the Transmedics system, and if it was going to be used, perfusionists were sequentially phoned until a volunteer was found.

There is Perfusion Department interest in being involved in XVIVO™ Hypothermic Oxygenation Perfusion (HOPE) technology, but the perfusion department has not been part of preparing the business case and should have been, as there are implications for perfusion staffing. (Parenthetically, the same thing happened with preparing the business case for the ECMO retrieval service). There is concern in the perfusion department that although Sch4 Pt3 No 3 with the XVIVO™HOPE system, that family commitments, childcare etc will mitigate against being out on long XVIVO retrieval trips. (Ultimately, the role of the perfusionist in the XVIVO™ HOPE system will be to prime the box and with institutional experience, the perfusionist will not need to go on HOPE runs). However, their concern is that the administration will not adequately resource the XVIVO™ HOPE system implementation and it may fail. Also, there is no surgical lead for heart transplantation to champion donor heart preservation technology (Recommendation 16 and 19).

Infectious Diseases Service

In total, the TPCH Infectious Service (ID) comprises 6 ID physicians and 2 medical trainees. The ID service has had a consultative, refer as needed, relationship with the transplant teams up until recently when 0.7 FTE transplant ID (TID) position has been created. For the past 6 months a dedicated 0.7 FTE ID physician has been available and attends the Thursday Lung and Heart transplant Service's combined MDT meeting where pre- and post-transplant cases are discussed. There is not a good mechanism to document discussions in the MDT meeting (Recommendation 4).

ID has a good relationship with the Heart Transplant Service, but less communication with heart surgery, where there is a slowness to refer. Overall, ID is more involved with the Heart Transplant than Lung Transplant Service. The ID physician will see consultations as referred by the teams as in-patients or as outpatients and follow up patients there. ID advice with regard to organ offers occurs mainly with the heart transplant team.

Overall, there is a lack of systematic engagement between TID and transplant teams and other supporting services. For example, there are no dedicated TID pre-transplant assessment clinics, combined ward rounds or co-located post-transplant follow up clinics for patients with infection. Pre-transplant antibiotic allergy labels and post-transplant vaccination are other areas that are not overseen by ID. Formal structures for liaison with microbiology, antimicrobial stewardship, infection prevention and organ offers regarding TID issues were not available, or are not in place.

The TID team should be seen as core members of both the heart and lung transplant teams (Recommendation 20).

The TID team should have combined ward rounds/case discussion with the heart and lung teams, reviewing in-patients and attend all regular MDT meetings for both heart and lung transplantation. The TID team should have outpatient booking slots and rooms available in heart/lung transplant follow-up clinics to see patients with infection issues alongside the transplant teams.

Systems should be developed for the TID team to be rapidly informed on key microbiology results e.g. positive blood cultures or cultures from sterile sites, positive fungal cultures from transplant patients should be explored, so that the TID team do not need to wait on a referral for patients with potentially critical infections.

The TID team should be invited to contribute to protocols for infection screening and management in both heart and lung transplant, and have a recognised role in antimicrobial stewardship in developing antimicrobial guidelines and reviewing antimicrobial use, in conjunction with pharmacy and the transplant teams.

The TID team should create links to be informed of infection prevention surveillance, testing, environmental concerns on the wards housing transplant recipients.

Although the lung transplant team are comfortable with handling infection issues, a more systematic engagement with the lung transplant team could be promoted. This will future proof the service, avoid reliance on expertise of individuals and build the TID expertise at TPCH.

Hospital in the Home (HITH) is not frequently used by transplant services and was not discussed, but may be an area for TID oversight. Ongoing support from TID may also facilitate the early transition to oral antibiotic reducing the need for ongoing IV therapy. This in combination with HITH may off-load busy senior transplant nursing staff particularly the Lung Transplant Service. (Recommendation 21).

The TID team should be supported to develop research and audit capabilities, working with the transplant Services (Recommendation 5, 6 and 7).

Although there is currently 0.7 FTE of one physician allocated to TID, the role could support additional personnel and for sustainability should train future TID physicians. Mechanisms for trainee physicians to rotate through TID as well as consideration of other supporting roles such as nurse practitioner (with a portfolio of sepsis, antimicrobial stewardship including antimicrobial allergy, vaccination, hospital in the home liaison) or TID pharmacist should be explored.

Nursing Services Review

Heart Transplant Nursing

The Reviewers were provided with a power-point presentation on the activity of the Mechanical Circulatory Support (MCS) program outlining current staffing, patient and program outcomes.

Currently there are 15 patients supported on LVAD's (1 patient on Heartware and 14 patients on Heartmate 3), 7 implants have been performed year to date in 2024, verses a total of 7 implants last year. Numbers of patient supported on MCS are growing, however, only 5 of the MCS patients are currently wait-listed for heart transplantation and a further 10 patients were not wait-listed.

MCS Clinical Nurse Consultant (CNC)- The MCS CNC role is currently staffed at 0.5 FTE, noting this service is under resourced from a nursing perspective, particularly as the ISHLT recommendations are 1.0 FTE per 9 supported MCS patients (Table 1). The current clinical case load per MSC CNC does not meet current international guidelines. (JHLT,42:7; 2023, e1-e222)

The MCS CNC role does not appear to have any additional independent support. The remaining 0.5 FTE is covered by the heart transplant Nurse Practitioner (NP) and Clinical Nurse (CN), who already have a significant clinical caseload. MCS patients are a highly complex group with diverse clinical needs, including anticoagulation management, and this piecemeal "cover" seems inadequate and could lead to suboptimal outcomes (Recommendation 22).

Table 1. MCS Nursing requirements based on Post MCS Cohort size

MCS Cohort Recommended FTE	TPCH Current MCS Nursing FTE (Cohort of 15)	ISHLT recommended MCS Nursing FTE Cohort of 9	ISHLT recommended MCS Nursing FTE Cohort of 20
FTE	0.5*	1.0	2.2

*Below International recommendations for MCS Staffing (JHLT,42:7; 2023, e1-e222)

Consumer satisfaction was high for MCS CNC. Staff and consumers were very positive about the co-ordinator's role and the support they receive. However, there is no allocated FTE staffing for psychological care and this was identified as a significant challenge, by the heart transplant nursing and medical teams, and was reiterated by the consumer group during a separate discussion. The Reviewers noted that staff education on MCS relies heavily on an external source – Heartmate company representative Sch4 Pt3 No 3 and it was also noted that clinical protocols are out of date and not reflective of the current MCS devices.

There is considerable risk of burn out Sch4 Pt3 No 3 , and noting additional FTE for this role has been requested but not supported. The future growth of this program will also rely on increased FTE (recommendation 22).

Nurse Practitioner (NP) – The Reviewers were provided with a power-point presentation on activity and current responsibilities of the NP and CN roles in heart transplant nursing service. TPCH currently has approximately 347 heart transplant recipients under the care of the service. Forty-five patients were evaluated for transplantation, 8 are currently listed and 5 patients have been transplanted year to date at the time of this Review in July 2024, compared to a total of 9 heart transplants in 2023. The current staffing is NP@ 0.8 FTE and CN @ 1.0 FTE which again, does not meet the ISHLT recommendation of 1.0 FTE per 90 heart transplant recipients

Table 2. Heart Transplant Nursing requirements based on HTX Post transplant Cohort size

HTX Cohort Recommended FTE	TPCH Current HTX Nursing FTE (Cohort of 347+)	ISHLT recommended HTx Nursing FTE Cohort of 340	ISHLT recommended HTx Nursing FTE Cohort of 360	ISHLT recommended HTx Nursing FTE Cohort of 400
FTE	1.8*	3.7	4.0	4.4

*Below International recommendations for Heart Tx Staffing. (JHLT;34:2:2015;140-148)

Heart Transplant Nursing Support should be increased to the recommendation outlined above in Table 2 (Recommendation 22)

The Sch4 Pt3 No 3 increasing workload that is not acknowledged by nursing line managers and Sch4 Pt3 No 3 Leadership in nursing at TPCH was described as a "constant rotation of line managers" Sch4 Pt3 No 3 The Reviewers met with Sch4 Pt3 No 3 that the on-call component was unsustainable (Recommendation 22 and 26).

Sch4 Pt3 No 3 significant barriers to listing heart patients for transplant, in particular the non-attendance at MDT meetings by surgeons that resulted in listing delays. The consumer group also highlighted the distress and uncertainty felt by patients who were waiting for a decision, often for months.

On call duties rely on retrieval 'perfusion' nurses who are volunteers from wards, and often pulled out as required. However, there are frequent issues on public holidays and during leave. All transplant nursing staff are expected to provide training and provide on call support whenever required, often at short notice. Clinical nurses are rotated to the Heart Transplant Service for training, often over 6 months but are frequently pulled back to their permanent areas. Sch4 Pt3 No 3 had trained 7 CNs but had retained only 1 (Recommendation 23 and 26).

There is no succession planning for the MCS CNC and heart transplant NP roles. Both roles are currently staffed by highly specialised clinicians with a wealth of experience in their areas. Over the last 30 years these roles have evolved with advances in clinical practice and research. In the past the transplant co-ordinator role primarily assisted in donor procurement, program organisation and teaching patients, however over time, this role has progressed and diversified into an expert nursing clinician CNC/NP Service. (Recommendation 22, 24, 25 and 26).

The current NP role is not being afforded the opportunity to work within her scope of practice. The current NP role appears to encompasses a considerable number of non-clinical and inappropriate responsibilities. It is an unsatisfactory use of this expert nurse's time and expertise to be booking

angiograms, endomyocardial biopsies and right heart catheterizations. These are time consuming, purely administrative tasks that prevent the NP from providing consultations that would optimise care delivery, whilst providing a recognised Medicare rebatable service. The Reviewers were given a distressing example of the inappropriate demands on nursing staff during the fungal outbreak when Sch4 Pt3 No 3 actively clean a theatre space where perfusion and donor retrieval equipment was stored (Recommendation 1, 25 and 26).

Sch4 Pt3 No 3

Recognising that the NP does not have enough resources to meet the demands of her complex patient group, Sch4 Pt3 No 3 should not be a reflection on the NP service (Recommendation 22, and 25).

During the Review discussions, it was evident that there was a lack of collaboration between surgeons, physicians and the heart transplant nursing team. An example was given of a patient who was deemed unsuitable for an LVAD at a prior MDT meeting, but Sch4 Pt3 No 3 subsequently consented the patient for an LVAD and proceeded with LVAD implantation. The consequences of this decision and the clinical management of a complex, un-transplantable patient became the responsibility of the heart transplant physicians, nurses and allied health members (Recommendation 1, 4, 15 & 19).

The recruitment and retention of cardiothoracic transplant NP, CNC, and CN's are critical to the viability of the QLD heart and lung transplant services, and the quality outcomes for heart and lung transplant recipients.

Lung Transplant Nursing

Sch4 Pt3 No 3

The Lung Transplant Service at TPCH manages a cohort of approximately 330 patients, with an average of 26 lung transplants per year since 2019; they assess around 60 potential transplant patients per year from QLD, NT and northern NSW, and currently have 11 patients on the waiting list. Sch4 Pt3 No 3 the Lung Transplant Service appeared more organised and cohesive compared with the Heart Transplant Service. Furthermore, compared to the Heart Transplant Service, there appears to be more robust governance and audit processes.

From a nursing perspective, the ambulatory out-patient Lung Transplant Service is set up differently to the Heart Transplant Service with no NP role. The Lung Transplant Service is very medically driven,

Sch4 Pt3 No 3

At the time of the Review, lung transplant nursing was under resourced for 330 post-transplant patients being managed by a total of 3.5 FTE (1 CNC @1.0 FTE, 2 CN @ 1.0 FTE Sch4 Pt3 No 3

, and another 1 CN@ 0.5 FTE (who also works 01. FTE in a lung transplant dermatology clinic).

ISHLT Cardiothoracic Transplant Nursing consensus guidelines (JHLT;34:2:2015;140-148) recommends 1.0 FTE per 80 lung transplant patients due to the complexity of lung patient management long term (compared to heart transplantation: 1.0 FTE per 90 pts).

Table 3. Lung Transplant Nursing requirements based on LTX Post transplant Cohort size

LTX Cohort Recommended FTE	TPCH Current LTX Nursing FTE (Cohort of 330+)	ISHLT recommended LTx Nursing FTE Cohort of 320	ISHLT recommended LTx Nursing FTE Cohort of 360	ISHLT recommended LTx Nursing FTE Cohort of 400
FTE	3.5*	4.0	4.5	5.0

*Below International recommendations for LTX Staffing (JHLT;34:2:2015;140-148)

As per Table 3, TPCH should have at least 4.0 FTE in lung transplant nursing roles (NP/CNC/CN) for 330 patients (Recommendation 22).

The lung transplant CNC and CN responsibilities have been divided up to enable the current team to manage the workload. The CNC manages all the assessment patients (approximately 60-70 per year) and wait-list patients. The CNC is also effectively the Nursing Unit Manager (NUM) managing the other lung transplant nurses, thus is responsible for lung transplant CN rosters/ payroll/recruiting new nursing staff; has financial delegation for consumables for both lung and heart transplant services and aircraft costs for organ retrieval; manages and participates in the on-call (out of hours) thoracic transplant coordination and on-call perfusion nurse rosters. Additionally, the CNC may also be required to back fill the perfusion-nurse roster if there a rostered gap or leave (planned or unplanned) and collects/ collates all data relating to nursing activities.

The CN's manage the post LTx patients, including participating in the 3 weekly outpatient clinics (50 pts per week) and only if they have a full roster or CN FTE working, one CN will go on ward rounds to facilitate lung transplant patient education and discharge planning, whilst the other CN manages the clinics. The CNs manage the majority of home intravenous antibiotic treatments (rarely use HITH) including IV PICC and PORT management; provide post-transplant patient phone call and email triage; follow up pathology results; coordinating follow-up appointments – the use of telehealth is common due to remote distance location of many patients. The CNs also contribute to the 24 hour /7 days per week transplant coordination roster. Lung transplant CNs also assist with education of patients with diabetes as there is minimal FTE for diabetes educators at TPCH (Recommendation 22 and 27).

In terms of the on-call roster, the CNC & CNs for lung transplantation and the NP for heart transplantation take all donor calls between 0700 – 1630 hours weekdays regardless of their workload. There are 6 other nursing staff who participate in the after-hours thoracic transplant coordination roster and they come from Pulmonary hypertension / VAD/ Palliative Care / Thoracic Ward / Education and Research. Each person on call out-of-hours can be absent from their day role the next day, including the lung transplant CNC/ CNs and heart transplant NP which then impacts their ability of the transplant services to manage the out-patient work-load (Recommendation 22, 23 and 26).

The 'perfusion nurse' roster appears to provide continual challenges; it is a specific role where the perfusion nurse goes with the donor retrieval surgeon and scrub nurse to the donor hospital Operating Theatre to assist with donor lung perfusion and other tasks outlined in the documents provided. The

nursing staff rotating in this on-call roster are generally not from the transplant services; have to be specially trained to work in a sterile operating theatre environment, and their usual staff manager can at any time block them being involved, leaving the gap in the perfusion roster to be picked up by the other fatigued on-call thoracic transplant nurses. There is also a problem with ordering and space to store retrieval supplies (Recommendation 23).

As there is no data manager (this position was apparently taken away years ago), the lung transplant CNC has to manually enter all donor referral information into a database- (heart and lung donors) and enter the subsequent lung transplant outcome data (Recommendation 28).

The CNC is also responsible for supervising and educating new CNs in lung transplantation. This involves a large amount of unrecognised work, and it is particularly frustrating when these newly trained staff are unable to stay with the team due to staffing pressures (e.g. in ICU) leading to them being pulled back to their prior ward/department, despite the staff member(s) preferring to stay with the lung transplant service.

Only planned annual leave in transplant nursing is backfilled and there is no cover for sick leave, so the CNC or other nursing staff have to pick up the extra work; overtime is never paid, and 'time-off-in-lieu' is not permitted as well. They have been advised by various nursing directors to just 'manage time better', rather than their nursing leadership acknowledging and supporting funding for over-time hours. There is no recognition of the impact of unplanned leave in this small team running on limited FTE, nor that many administration/data collection tasks are done by the nursing team, taking them away from clinical roles. Nursing staff are also not permitted to report 'work-load' grievances.

It is suggested there have been approximately 5 different Nursing Directors of Heart and Lung over the last few years with some lasting only months, resulting in a void of senior nursing leadership and mentorship. Sch4 Pt3 No 3

(Recommendation 26).

Overall, there is no plan for growth or professional development with current lung transplant nursing FTE, despite increasing numbers of lung transplant patients who will require long term care, and an increase in older transplant recipients with more comorbidities. The current lung transplant nursing team describe a very busy workload, sometimes chaotic, in a work environment which has high expectations and is chronically understaffed. Similar to the heart transplant nursing team, this results in unsafe and unsustainable work practices- leading to burn out of the team and making it difficult to recruit new staff to the roles (Recommendation 22 and Recommendation 26).

Consumer feedback regarding the lung transplant nursing team was generally more positive compared with the heart transplant team, with good communication described from the lung team. However, there were perceived staffing (leave) pressures which at times impacted the quality of expected care and education post-transplant.

Inpatient Heart Transplant Nursing

A general overview of the current facilities on ward 1B and the inpatient care of heart transplant recipients was provided. Nursing staff were described as enjoying the challenge of managing the care of the heart transplant recipients and MCS patients and have built good relationships that ensured continuity of care in the event the individuals needed readmission in future. The Reviewers noted that

heart transplant recipients were frequently readmitted into 2 and 4 bed areas thus increasing the risks of cross infection for this vulnerable patient cohort (Recommendation 29 and 30).

Education and competency assessment were provided by the clinical educator and the MCS CNC. The heart transplant NP role was described as predominantly outpatient based and it was highlighted that the current workload prevents the NP from providing support to staff and patients on the ward. By contrast the staff and MCS patients felt well supported by the MCS CNC who co-ordinated education and discharge preparation.

There was a clear loss of staff morale related to the decision to move patients to ward 2E post-heart transplant after the recent fungal case outbreak, and this decision does not appear to have been discussed or validated with the ward nursing team. The response of the ward staff to this decision was that they felt responsible for the clinical outcomes in these patients with fungal infections, without any validation.

The Reviewers questioned the rationale/criteria for the decision to admit patients post-heart transplant to ward 2E and how the nursing staff in this area had been upskilled to care for heart transplant patients. It was certainly evident to the Reviewers that the directive had had a considerable adverse impact on staff morale in ward 1B. It was unclear if this was a permanent or temporary decision (Recommendation 26, 29 and 30).

Communication was described as difficult due to lack of access and cohesion between heart transplant medical and surgical teams. Staff were often unable to reach the surgical team to voice concerns and often were not included in discussion for individual patient management plans. There were frequent consumer and family complaints about lack of communication and the over-use of medical jargon. The general impression of the Reviewers was that the care provided for heart transplant patients was not cohesive, and that communication between team members, specifically physicians and surgeons, post- operatively was poor (Recommendation 1, 4, 8 and 19).

Timely patient discharges from ICU are impacted by the general ruling that transfers to the heart and lung transplant wards are only facilitated on a Monday to Thursday. There was no provision for transfer Friday to Sunday regardless of patient suitability and they remain in ICU until Monday - adding to ICU workload, increased costs of patient care, potential for negative psychological stressors & delayed rehabilitation. The delay of discharge from ICU was determined to be inadequate and should be reviewed, with the aim that timeline for discharge should occur in line with the patient's clinical status. This also may have an impact on reducing patient's risk of delirium related to the ICU stay and promote better sleep hygiene (Recommendation 31).

Allied Health Review

The Reviewers met briefly Sch4 Pt3 No 3 Allied Health and also were provided a document which outlines Allied Health staffing FTE and their specific roles, as well as comments regarding gaps in their capacity identified as needing to be addressed. Sch4 Pt3 No 3 many Allied Health staff have been traumatised by the change in focus by Metro Health, which was directing staff away from the Heart and Lung specialities, with no consultation with these respective services or the Allied Health team. Sch4 Pt3 No 3

Physiotherapy

Sch4 Pt3 No 3

The outpatient physiotherapist predominantly manages the Lung Transplant Service population. There is limited capacity to support the Heart Transplant Service or provide cardiac rehabilitation.

Frailty assessment, muscle strength which is assessed by quadricep strength testing, is performed to target those who require additional support, however it was unclear if this assessment was provided to both the lung and heart services. There are no cognitive or psychological components of frailty assessment performed. Of concern, there is no pre-transplant rehabilitation at TPCH for those accepted and awaiting heart transplant, and this occurred in the community at local heart failure exercise programs. The MCS patient cohort were provided with gym sessions.

Sch4 Pt3 No 3

has a strong focus in research and developing national guidelines, however outpatient services were severely stretched, limited by the facility and the capacity for only 12 patients at one time.

The inpatient physiotherapist described a broad role covering the Lung and Heart Transplant Services, mechanical circulatory support, adult congenital heart disease (ACHD) and pulmonary hypertension (PH). The position's workload is deemed to be unsustainable.

There are inadequate facilities, lack of gym space and equipment at TPCH with most actively listed cardiac patients being supported in community programs. Additionally, there are insufficient assessments performed prior to MCS implantation leading to inappropriate patient selection, the consequences of which fall to the physicians, nursing and allied health staff. This has been similarly highlighted in nursing interviews (Recommendation 32).

Sch4 Pt3 No 3

(Recommendation 1, 8, 15, 19 and 40).

Of concern, there have been no opportunities for professional development, education or training for the past 5 years. There is no succession plan, no increase in FTE for 10 years despite the growth in all lines of responsibility. There is no structure for mentoring or training across the specialties. This is particularly significant when Sch4 Pt3 No 3 are close to retirement (Recommendation 32 and 33).

Sch4 Pt3 No 3

summary of the current issues in the heart transplant program, describing gaps in services that need to be targeted: no psychological services, no occupational therapy service, no workplace flexibility, no staff recognition for achievements. Sch4 Pt3 No 3

Overall, it is apparent the current physiotherapist FTE profile is grossly inadequate to meet the demands of 5 inpatient/outpatient state services. Given that frailty occurs in 50% of heart failure patients and is an important prognostic sign for mortality before and following heart transplantation, hospitalisations and lower quality of life, an initial recommendation of the Reviewers is that the current physiotherapy services should be expanded to include support for cardiac patients awaiting

transplantation. Benchmarking against other state thoracic transplant services will assist with long term recommendations and planning for the future (Recommendation 32).

Social Work

There are 2 senior Social Workers employed across the TPCH transplant programs, 1.0 FTE for the Lung Transplant Service and 1.0 FTE for the Heart Transplant Service, congenital heart disease and heart failure. s47 (3)(b) around 2000 patients including inpatients/outpatients with heart failure, Heart Transplant Service and MCS Service inpatients/outpatients, Adult Congenital Heart Service, and paediatric heart patients who transition to the adult service from Queensland Children's Hospital (area includes all of Qld up to Papua New Guinea). Sch4 Pt3 No 3 a similar load of patients in Respiratory medicine (including the Lung Transplant Service, Pulmonary Arterial Hypertension, Pulmonary Fibrosis and Cystic Fibrosis).

Social Work undertake two comprehensive psychosocial assessments on potential transplant recipients, are involved in pre-transplant evaluations and transplant education sessions, attend clinics and ward rounds, assist with discharge planning, bereavement support and coordinate patient support groups. Social Work staff also supervise students during their workplace placements.

Social Work can recommend that a patient is not a suitable transplant candidate due to unmet psychosocial complexities, however often find it hard to speak up at the assessment MDT meetings Sch4 Pt3 No 3 The MDT meetings should be appropriately chaired to ensure all personnel can safely speak up with relevant comments regarding potential Heart Transplant patient suitability. Allied health has now been excluded from the Heart Transplant MDT discussions on a Thursday which are limited to surgical, medical and key nursing staff only (Recommendation 4).

Social Work is often required to sort out long-standing and entrenched social/ psychiatric/ psychological issues to ensure a patient is suitable for transplant. Notably there is no transplant psychology FTE for the Heart Transplant Service, although there is 1.0 FTE psychologist support for the Lung Transplant and Cystic Fibrosis Services. Social Work is often called upon to sort out issues with a transplant patient's family social situation, housing options and even appointments. The Social Worker commonly advises patients to get a General Practitioner and mental health plan, but there are long waiting times and ultimately this inexpert advice is not often helpful.

Overall, it is clear there needs to be increased Psychology FTE for the Heart Transplant Service, given that these are the very complex patients, a number of whom require MCS, are geographically isolated with or without a history of psychological issues. These are important issues that can impact transplant suitability.

There is an expectation by the Heart Transplant Service that Social Work should provide ongoing life-long psychosocial support for complex patients, even when they are regional patients and return home, not just during admissions or for end-of-life care. Emphasis should be on early intervention and assessment and aim to link into local regional services to reduce life-long dependency on the TPCH Social Work team. The current structure incorporating the Heart Failure Service creates an unsustainable large amount of work for the 'Heart Transplant' Social worker. The Reviewers

recommend an additional Social Worker (separated from heart failure) who is solely focused on supporting heart transplantation and MCS patients (Recommendation 33).

Social Work are expected to complete all of the patient travel documents (anyone living more than50km from TPCH can get funding support, so a large percentage of patients claim for this), insurance documents, arrange accommodation which is very time consuming and takes many hours of time away from patient care. Social Work also must do all their own filing of assessment notes in the paper medical record (located in a different building) yet Social Work have no administration officer to assist with these administration type tasks (Recommendation 34).

There is a lack of clinic rooms/provided space for Social Work to conduct their transplant patient assessments which often leads to patients having to discuss very personal information in an open/ public space or shared office. There is no space available on the TPCH main campus for Social Work to run support groups, which is very much sought after by the patients, carers and consumers (Recommendation 35).

Psychology

The Reviewers Sch4 Pt3 No 3 Lung Transplant Service/Cystic Fibrosis psychology roles. Information was also provided the Heart Transplant team, Lung Transplant team and distressed consumers (patients and care givers).

Currently there is FTE in psychology which is funded for the Lung Transplant Service/Cystic Fibrosis (Sch4 Pt3 No 3)– which originated from a Cystic Fibrosis business case in 2015/16. The psychologists employed flex between Cystic Fibrosis and lung transplant patient groups as required, but the current FTE barely cover the increasing complexity of lung transplant patients and workload in the Lung Transplant as a Service.

The Reviewers were informed that the Lung Transplant Service has historically funded a 0.2 FTE Senior Medical Officer in Psychiatry for years. This was earmarked for mainly pre-transplant assessments, but has not come to fruition. Indeed, the psychiatry team Sch4 Pt3 No 3 are uncertain why they have been asked to see a patient. Then they stopped coming.

It is recognised that psychological support is imperative for good long-term transplant outcomes. Currently the lung transplant service does not have enough psychological FTE allocated to meet patient needs, as reported by consumers. This falls upon the under-resourced transplant coordinators and clinicians. It is recommended that there be 1.0 Psychologist allocated to the Lung Transplant Service (Recommendation 36).

The Reviewers note the additional impact and psychological strain the heavily scrutinized fungal infections have had, and continue to have, with the TPCH transplant recipients and their families who are reliant on TPCH for follow up and life-long care. Immediate additional psychological support for these consumers would go a long way in restoring TPCHs reputation (Recommendation 1 and 36).

The psychologists work on a referral basis and usually see patients within 48 hours either face-to-face or telehealth. They liaise with community psychologists and out-reach programs (e.g. in Far North QLD), but many regional centres need more education on how to support post-lung transplant patients to reduce reliance on TPCH psychology services.

There is also no psychology FTE allocated for the Heart Transplant Service, Heart Failure and MCS programs. Psychological and psychiatric issues are taking up a huge amount of Social Work, medical and nursing staff time and resources. Unchecked, this deficiency can lead to poor patient selection eg., patients who have undergone LVAD implantation who are then found not suitable for heart transplantation due to multiple psycho-social factors.

Additionally, there is no neuro-psychology support. Occasionally, the Heart Transplant Service request an urgent inpatient intervention by the Lung Transplant Service psychologist, which may only occur if there is availability.

Overall, the lack of Psychology and Liaison Psychiatry for the Heart Transplant Service is seen as a significant gap and risk to service provision by both the Reviewers, Heart Transplant team, and by consumers. The Heart Transplant Social Worker has tried to fill the gap, but this is not sustainable and there are patients 'falling through the cracks' as articulated by both transplant consumer groups and health care professionals (Recommendation 36).

The acute issues illustrated above support the urgent recommendation of an additional psychologist (1.0 FTE) to work across both Heart transplant and Lung Transplant Services (this would be in addition to the 0.8 FTE funded from CF).

Nutrition Services

Sch4 Pt3 No 3

Lung Transplant Service: There is 1.05 FTE funding covering in- and out-patients (4 per week) referrals and assessments noting a mix of pre and post-transplant patients. FTE has not increased for many years despite an increase in lung transplant assessments and lung transplant numbers. A lack of career progression and higher qualification allowances in recognition of significant contributions to national and international Transplant Guidelines and research activities was also commented upon. Of note, dieticians now have some clinic space in outpatient clinics (both pre and post-transplant) which has led to improved medical access and a reduced burden of clinic visits for lung transplant patients.

Heart Transplant Service: There are currently only 0.2 FTE for inpatients and 0.1 for outpatients funded via the Complex Cardiology Clinic to help support LVAD and heart transplant patients, both pre- and post-transplant. Three staff rotate through the 0.2 FTE – none are recognised as senior dieticians. They also need to service general cardiology clinics. There has been no increase in FTE despite an increase in heart transplant assessments and transplants, many whom are medically complex, such as obese patients, making them unsuitable for transplantation unless they lose weight-but may undergo LVAD implantation and then rely on weight reduction to eventually meet transplant suitability weight criteria. Dieticians are slowly getting more access to Heart Transplant Service outpatient rooms, though still often having to see them in the waiting area, as there are no spare clinic rooms.

Increased nutrition support is warranted for the Heart Transplant Service. This would also support patients with an LVAD who don't meet BMI criteria for listing for heart transplantation based on ISHLT guidelines 2021 (Recommendation 37).

Recent improvements in Heart Transplant Service dietetics research Sch4 Pt3 No 3 in this area, but as this is all funded from research grants, support for dietician involvement is not guaranteed.

Overall, Diabetes Mellitus (DM) management is very poorly supported across both transplant programs as there is no diabetes educator available for any transplant clinics, and diabetes education is limited to in-patients with newly diagnosed DM. Given post-transplant DM occurs in up to 50% of transplant patients due to immunosuppression medications, this is a key gap in service provision (Recommendation 27).

Pharmacy

Sch4 Pt3 No 3 across the heart and lung transplantation programs. Currently there is 1.0 FTE allocated to Heart Failure and heart transplantation inpatients, 2.0 FTE for ICU and 2.0 FTE for Lung Transplant, which includes both inpatients and outpatients. There is a separate 0.5 FTE for Pulmonary Arterial Hypertension patients.

Currently, there is no specific pharmacist for the heart transplant out-patient clinics, although there is 1.0 FTE pharmacist for Heart Failure out-patients. (Recommendation 38).

Sch4 Pt3 No 3 about MCS and pre-heart transplant patients being taken off Entresto and SGLT2 Sch4 Pt3 No 3 and this action was impacting heart transplant waiting list patients in particular, making them more unstable, as illustrated previously. The pharmacists and heart transplant nurses are rarely available for ward rounds Sch4 Pt3 No 3 as they are too usually busy.

Sch4 Pt3 No 3 limitation in available clinic rooms to see outpatients, so they have to review patient medications and educate patients in the waiting room (across heart and Lung Transplant Service patients).

It was noted Sch4 Pt3 No 3 has resisted on-line (IPA) streamlined access to high-cost drugs, resulting in access for some medications taking weeks rather than hours to be approved, also adversely affecting patient care.

Organisational Review

TPCH cardiothoracic transplantation and related allied support services clearly have entrenched major staffing and structural management problems. There are Sch4 Pt3 No 3 clinical skills gaps, confusion over roles and rostering, chronic resource deficits, and no overt current management strategies to address these issues. The Reviewers believe that there needs to be a new structure created to refocus the transplant teams, removing old 'battle lines' and enabling the above recommendations to be facilitated. Immediate action is required to decompress the current staff stress.

The Reviewers recognise that one of the key recommendations will be to change the reporting line of the heart failure and heart transplant service incorporating mechanical circulatory support. A number of options were considered (Recommendation 39-41). These include:

- **Option 1**. - An overarching Thoracic Transplantation Program structure with governance over the Heart and Lung Transplant Services and MCS, that would report directly to the senior executive team of TPCH. In the first instance we would suggest that an individual such

Sch4 Pt3 No 3 or someone with similar experience, be strongly encouraged and supported to take on this leadership role- even if only temporarily (ie for 2 years).

- **Option 2**. - Heart failure, heart transplantation and MCS sits outside cardiology, reporting to the Director of Heart and Lung Operations

- **Option 3.** - Heart failure, heart transplantation and MCS sits within the Cardiothoracic Surgical Department, reporting to the Surgical Director (to be appointed) of Heart and Lung Transplantation and MCS

- **Option 4**. - Heart failure, heart transplantation and MCS stay within the Cardiology Department but have a reporting line to another senior cardiologist

Sch4 Pt3 No 3 a combined Heart and Lung Transplant Program structure (**Option 1**) was described as being 'unacceptable' to the Lung Transplant Service. Sch4 Pt3 No 3 . While conceptually **Option 1** may have been the better solution, the Reviewers feel this could therefore be fraught with difficulties.

None of the other options are ideal, but perhaps **Option 2** may be the least problematic.

The Reviewers feel that there are so many nuances that they would not be aware of, coupled with the animus and dysfunction that we have been made aware of that would be critical to a governance solution, that the Reviewers are unable to make a firm recommendation. However, **Option 2** may be, at least in the short term the preferable solution.

To be clear, although the focus of the above comments is on assisting/re-aligning the medical Heart Transplant Services, there are parallel Nursing and Allied Health issues across the board that also require a dovetailed overarching structure.

The Reviewers discussed at length the alternative of shutting down the TPCH Heart Transplant Service, but unanimously felt that this would not be in the interests of QLD patients with severe heart disease, the existing hard-working TPCH staff, or TPCH. Resources must be applied to the issues raised by the review to solve this 'crisis' (Recommendation 2, 22, 39 and 41).

Looking in from outside, the management structures above those we were tasked to examine must take responsibility for taking too long to flag and remedy the major downstream problems evident across heart and lung transplantation. Many TPCH Departments, including Thoracic Medicine, Cardiothoracic Surgery, Nursing, Allied Health, Human Resources as well as the Hospital's General Administration and Executive have clearly not sufficiently promoted or supported workforce cultural practices that should enable reporting, resolution and consequential responses to misconduct, inappropriate behaviour and questionable clinical actions. Many of the issues are long standing with documented reviews or senior-level discussions, but no resolution subsequently, creating a sense of staff despondency and disillusionment. Staff surveys provided back this up. The Reviewers would strongly suggest an internal review of the TPCH Human Resources Department and Management past responses to the issues raised, to enable a future 'zero tolerance' attitude and improved workplace preventative strategies and cultural support for those staff experiencing and reporting future inappropriate workplace interactions and encounters (Recommendation 40).

To protect the health and safety of this workforce we recommend mental health checks and appropriate support for distressed staff (possibly akin to the 'RU OK?' campaign) (Recommendation 1). This may be best done by staff outside of the staff members normal line-manager. Unprofessional staff interactions must be able to be called out, without penalty or prejudice.

Leave and overtime management (most obviously in heart transplant) is clearly lacking. Rostering is difficult across medicine, surgery and coordination (clinical nursing and coordination of transplants) and needs high level support and creative, long term HR solutions (Recommendation 41).

Opportunities for transplant medical and surgical consultants to take advantage of training opportunities both within Australia and internationally (most obviously in the Heart Transplant medical Service, and Lung Transplant Service with respect to more contemporary lung transplant techniques), must be supported (Recommendations 7, 8, 11, 18 and 19).

It has been noted both Heart and Lung Transplant Services have a conservative approach to donor organ utilisation. This issue should be explored by examining and benchmarking against the practices of other Australian thoracic transplant units.

Acquiring funding for succession planning is difficult in the public health system but must be planned and budgeted for. In benchmarking TPCH transplant activity, the Reviewers note the need for transplant growth in complexity as well as number and these must be planned for. TCPH needs a 5-year consolidation and development plan for its cardiothoracic transplant services. No individual we interviewed and no documentation we saw referred to the future. Consistent with public expectations, the mission statement of these TPCH teams should 'target best quality care for all Queenslanders with advanced heart and lung disease' (Recommendation 42).

The Reviewers note that there are no in-house services in a number of areas that have an important relationship with thoracic transplantation, namely renal medicine (and dialysis servicing in particular), gastroenterology and dental surgery. Strengthening the delivery of these services at TPCH should be part of a future plan (Recommendation 43).

Data and audit inform quality and risk and data collection must now be funded in terms of a databases and FTE (Recommendation 6, 28 and 39). Ultimately locking in a further Review/Benchmarking exercise in another 2 years would be both appropriate clinically and of great assurance to the staff that their concerns are being listened to, real change is possible and TPCH will be held to account for actually making those changes.

Report Disclaimer

This report has been prepared by a panel of external Reviewers with the skill and care ordinarily exercised by a reasonable clinician. This report was created based upon the time scale involved and the resources, including financial and manpower resources, agreed between reviewers and the TPCH Administration.

Appendix A

Recommendations of the Reviewers:

Recommendation 1: All TPCH Staff have access to and receive confidential appropriate employee assistance, to support and protect mental health in response to this report or process associated with review of the Transplant Services. Where possible, the confidentiality and anonymity of those who were interviewed for this report, is respected.

Recommendation 2: Do not close or pause the existing TPCH Heart Transplant Service.

Recommendation 3: Plan to improve resourcing to support the flow of heart transplant candidates through assessment and presentation onto the active waiting list (for specifics see recommendation 22).

Recommendation 4: Establish a Heart Transplant MDT Meeting Terms of Reference, including a defined quorum of attendees which must identify compulsory attendance of heart transplant physicians and surgeons as part of their employment, face to face where possible. This document should illustrate acceptable interactions, and professional behaviour discussing clinical decisions, aligned with Code of Conduct for the Queensland Public Service. Senior nursing staff from 1B/2E and Allied Health transplant specialists, should be invited to the attend this weekly transplant MDT Meeting. Outcomes should continue to be documented in minutes and circulated to all parties following each meeting.

Recommendation 5: Develop evidenced-based, local consensus guidelines for the management of heart wait-listed and transplant candidacy patients and all (medical & surgical consultants) agree to abide by them. This document must refer to and keep abreast of, up-to-date international and national practice, and evidence-based care.

Recommendation 6: Regular donor and transplant outcome audit reporting (at no less than 3 monthly intervals) in a collaborative, inclusive, agreed upon and transparent fashion. A data management system that records all patients listed for and receiving advanced heart failure therapies (including MCS and heart and heart/lung transplantation), all donor offers, and their outcomes, needs to be established. This requires appropriate permanent FTE to manage data, establish and maintain this, as well as contribute to, and benchmark with ANZ Heart, ANZ Lung and ISHLT Registries.

Recommendation 7: The Heart Transplant Service needs to have current, easily accessible, evidence-based peri-operative management protocols (including immunosuppression and anti-infective strategies) which are finalised, adhered to and regularly reviewed (ie. every 2 years) based on clinical data.

Recommendation 8: TPCH must use the existing funding for the additional 1.0 cardiologist FTE in the Heart Transplant Service to recruit a new Head of Advanced Heart Failure and Heart Transplantation. The Reviewers believe that there should be a worldwide search for an experienced individual outside TPCH, with strong clinical skills in heart failure, cardiac transplantation and MCS in addition to academic credentials.

Recommendation 9: A new s47 (3)(b) of Intensive Care should be appointed. Sch4 Pt3 No 3 based on a worldwide search. This recruit should be experienced in all aspects of heart and lung transplantation and MCS ICU management, and ideally have academic credentials and a major commitment to raising the research activities and profile of the Department of Intensive Care.

Recommendation 10: ICU should either become a 24-hour consultant led department, or at least as a compromise, the consultant intensivist must remain on site to receive face-to-face handover when cardiac surgical and transplant cases occur after hours. Transplant and complex cardiothoracic cases must not be handed over to a junior doctor or trainee.

Recommendation 11: The Heart Transplant Service must focus on heart transplant and advanced heart failure therapies such as MCS. In approximately 66% of all advanced general heart failure cases, mechanical support or heart transplant will never be considered, and care going forward should be managed elsewhere (ie. under general cardiology).

Recommendation 12: Heart and Lung Transplant Surgical rostering needs to be revisited regarding any beneficial cross-cover between heart and lung transplant roster availability, as well as reconsidering the public general cardiothoracic surgical rosters, and any conflict with private cardiothoracic surgical commitments. Rostering will be improved in conjunction with Recommendation 13.

Recommendation 13: Heart and Lung donor procurement systems require changes to ensure sustainability. Surgical support would ultimately be the decision of a new Surgical Head of Transplantation, but could involve increasing the number of procurement surgeons to accommodate the potential loss of both current surgeons, in addition to training senior surgical trainees. Nursing and perfusion support for sustainable procurement similarly needs attention.

Recommendation 14: Any post-Review changes to staffing and resources across the TPCH Heart and Lung Transplant Services must not result in depleting the current successfully deployed resources of the Lung Transplant Service.

Recommendation 15: Sch4 Pt3 No 3

Recommendation 16: The TPCH heart transplant service must acquire the XVIVO™ HOPE system for donor heart procurement. Involvement of Anaesthesia and Perfusion Departments in planning and training on the technology is required.

Recommendation 17: The Cardiothoracic Surgical Department should explore collaboration with the Critical Care Research Group and other local academic institutions.

Recommendation 18: Surgical training to enable lung transplant cases to be performed using contemporary techniques through thoracotomy access, without the use of cardiopulmonary bypass must occur.

Recommendation 19: A cardiothoracic surgeon needs to be recruited as Head of Thoracic Transplantation and Mechanical Circulatory Support within the Department of Cardiothoracic Surgery, also reporting to the Director of the department. This recruit should be experienced in all aspects of heart and lung transplantation and MCS, and ideally have academic credentials and a major commitment to raising the research activities and profile of the Department of Cardiothoracic Surgery. This recruitment must be based on a worldwide search.

Recommendation 20: The Transplant Infectious Diseases (TID) Liaison staff should be seen as core members of both the Heart and Lung Transplant Services. A TID Service should be able to review outpatients, contribute to protocols, be linked in emerging key microbiological diagnostic results and TPCH Infection Control and infection prevention strategies and results.

Recommendation 21: An increased use of Hospital-in-the home should be considered to relieve busy transplant nursing staff and enable ID oversight, stewardship and assistance.

Recommendation 22: TPCH should to increase nursing staff across the transplant program to align with ISHLT standards. Staffing should be increased as follows 3.5 Nursing FTE in the Heart Transplant Service, 2.2 FTE in the MCS Service and 4.0 Nursing FTE in the Lung Transplant Service. The current Heart and Lung Transplant Services nursing ratios are inadequate, and a risk to patient safety and the organisation.

- To facilitate on-call transplant coordination without impacting the day-to-day thoracic transplant nursing workforce, the additional FTE recommended heart and lung transplant CN will assist will providing a more robust on-call service that also reduces the impact of personnel missing the following day.

-It is recommended that TPCH recommend TPCH nursing leadership look at other Australian (and international) thoracic transplant programs, where different nursing roles have been adopted to address some of these issues e.g. Employment of Pre-Transplant assessment coordinators, staff working PM/night duty on-call roster shifts to reduce the loss of day time staff.

Recommendation 23: The line reporting responsibility and rostering of the retrieval perfusion nurse role should actually sit within Cardiothoracic surgical/operating theatre team services and not within transplant nursing. Additionally, management of perfusion equipment and supplies (including storage) should lie with Cardiothoracic surgical services.

Recommendation 24: Evidence based nursing practice standard (policy/procedure) with appropriate ongoing training and succession planning, specific to the care of cardiac transplant recipients, dovetailing with Recommendation 7 and 22.

Recommendation 25: Provision of administration support and Review of Nurse Practitioner role responsibilities – reassignment of non-clinical responsibilities.

Recommendation 26: Permanent recruitment of Nursing Director who can provide leadership, mentorship and vision for Transplant nursing staff. The Reviewers recommend this role is an over-arching position specifically in charge of Cardiothoracic Transplant Nursing and sits alongside the medical directors of heart and lung transplantation and the proposed surgical director of thoracic transplantation and MCS

Recommendation 27: Employment of a diabetes educator across lung and heart transplant services (see recommendation in Allied Health sections). The lack of diabetes education FTE is a major service gap.

Recommendation 28: Employment of a heart and lung Transplant data manager would enable to CNC to focus on clinical nursing roles and responsibilities.

Recommendation 29: Review of policies related to infection control practices including allocation of single rooms, air handling and filtration and standardisation and audit of cleaning service provision on wards housing transplant recipients.

Recommendation 30: Review of criteria for clinical directive to relocate heart transplant recipients post-transplant to 2E.

Recommendation 31: Review of current policy related to delayed transfers from ICU discharge from ICU should align with recipient progress.

Recommendation 32: Expansion of the physiotherapy services to include support for cardiac transplant patients awaiting transplantation and provision of facilities and equipment. Review/benchmark against other Australian thoracic transplant services.

Recommendation 33 Recommend an additional Social Worker who is solely allocated to Heart Failure to enable the heart transplant Social Worker to focus on heart transplants and MCS patients.

Recommendation 34: Employment of an Allied Health Assistant or administration officer to assist Social Work with travel forms, travel arrangements and accommodation bookings etc. which will alleviate administration burden on Social Workers.

Recommendation 35: Re-structuring of clinic space or assessment timetable to ensure transplant Social Work, Pharmacy, dietetics and psychology have clinic rooms to see patients rather than using the waiting room This is a problem for many of the allied health team, clinic nursing staff and pharmacy.

Recommendation 36: Support current business case for an additional 2.0 FTE psychologists to work across both Heart and Lung Transplant Services (this would be additional to the 0.8 FTE funded for CF). Initial appointment of 1.0 FTE in addition to re-engagement with Clinical Liaison Psychiatry to provide dedicated service hours for heart and lung transplant Services would be an immediate start, supporting action that consumers and patients require.

Recommendation 37 Increase Heart Transplant Service Dietician FTE to at least 0.5FTE (ideally 1.0 FTE), to cover more inpatient and outpatient reviews. A senior Heart Transplant Service dietician (HP4) is needed. This would increase overall dietician FTE by 1.0 to cover both Heart and Lung Transplant Services.

Recommendation 38: Review pharmacy FTE to have a dedicated resource for the Heart Transplant Service/ VAD (Inpatient and Outpatients).

Recommendation 39: The Heart Failure and Heart Transplant Service reporting line needs to be changed. Sch4 Pt4 No 4

Recommendation 40: TPCH Human Resources Department and General Administration/Management Teams review past response to the issues laid out here and enable 'zero tolerance' and improved workplace preventative strategies and cultural support to staff experiencing future inappropriate workplace interactions.

Recommendation 41: TPCH Management Teams, Human Resources Department and Transplant leaders to improve rostering, excess overtime and excess leave balances, by increasing FTE to support leave relief.

Recommendation 42: A 5-year plan is created for Heart and Lung Transplant Services, allowing for succession planning, growth, increasing use of machine perfusion and linking with academia. It is imperative that this plan is created with, and executed by TPCH executive to support a collegiate approach to a growing service, with a focus on improving patient satisfaction and outcomes.

Recommendation 43: Increase TPCH on-site servicing by Renal Medicine, Gastroenterology and Dental Surgery.

Appendix B

Abbreviation	Definition
ADON	Acting Director of Nursing
BDD	Brain Death Donor
CF	Cystic Fibrosis
CHD	Congenital Heart Disease
CN	Clinical Nurses
CNC	Clinical Nurse Consultants
CCRG	Critical Care Research Group
DCD	Donation after circulatory-Death
EMBx	Endomyocardial Biopsy
FTE	Full Time Equivalent (also known as EFT)
HITH	Hospital in the Home
HOPE	Hypothermic Oxygenation Perfusion (HOPE)
ICU	Intensive Care Unit
ISHLT	International Society of Heart and Lung Transplantation
MDT	Multi-disciplinary Team
MCS	Mechanical Circulatory Support
NP	Nurse Practitioner
NSQHS	National Safety Quality Health Standards
OCS	Transmedics Organ Care System OCS
QCH	Queensland Children's Hospital
PAH	Pulmonary Arterial Hypertension
RHC	Right Heart Catheterisation
TID	Transplant Infectious Diseases Team
TPCH	The Prince Charles Hospital
VAD	Ventricular Assist Devices