“We want to be active partners in our own care, advocates for better kidney health and finally we want to know that our efforts and the work of clinical carers and researchers will lead to better outcomes for future patients – all patients, no matter where they live, how much they earn, their age or gender or how they are valued by the wider society. Every person with chronic kidney disease deserves nothing less.”
Quote from front page: Phil Carwsell OAM, Patient Partner

We acknowledge the Traditional Owners of Country throughout Australia and recognise their continuing connection to lands, waters and communities. We pay our respect to Aboriginal and Torres Strait Islander cultures; and to Elders both past, present and emerging.

The National Strategic Action Plan for Kidney Disease was led by Kidney Health Australia with funding from the Australian Government Department of Health.

For enquiries about the National Strategic Action Plan for Kidney Disease, and for information about kidney health and support, please contact the Kidney Health Australia Kidney Helpline on 1800 454 363 or visit the website kidney.org.au.

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The National Strategic Action Plan for Kidney Disease and the compendium documents were managed and written by Dr Emma Tinning, Dr Lisa Murphy and A/Prof Shilpa Jesudason of Kidney Health Australia.
Contents

CONSULTATION SUMMARY

ABBREVIATIONS 9

APPENDICES 10

Appendix 1: Acknowledgements

Appendix 2: Summary Report of Stakeholder Survey

Appendix 3: The Transplantation Society of Australia and New Zealand (TSANZ) Performance Report - Improving Access to and Outcomes of Kidney Transplantation for Aboriginal and Torres Strait Islander People in Australia

Appendix 4: Expert Clinician Panel Report for the Kidney Health Australia Caring for Australasians with Renal Impairment (KHA-CARI) Guidelines for the Management of Chronic Kidney Disease among Aboriginal and Torres Strait Islander Peoples.

Appendix 5: Catching Some Air - Asserting Indigenous Information Rights in Renal Disease
CONSULTATION SUMMARY

Introduction
This document is a compendium document to accompany the National Strategic Action Plan for Kidney Disease (the Action Plan). It provides an overview of the consultation process that was undertaken to formulate the three priority areas, including their objectives and actions for implementation.

Extensive consultation with a broad range of stakeholders was undertaken in the development of the Action Plan. Below is an overview of the activity that occurred as part of the consultation process. The consultation activities comprised:

1. Meetings of the Advisory Group
2. Roundtable of stakeholders
3. Meetings of the Kidney Health Australia National Consumer Council
4. Public online Stakeholder Survey
5. Individual meetings
6. Public consultation on the draft Action Plan

1. Advisory Group
Following the announcement of funding to Kidney Health Australia to develop the Action Plan in June 2018, an Advisory Group was convened to provide guidance on all aspects of the Action Plan. This group comprised experts across the kidney health sector including consumer representation. The members of the Advisory Group are listed in Appendix 1.

The first meeting of the Action Plan Advisory Group, held on 19 October 2018, identified five priority areas for action. Subsequent meetings were held on 3 December 2018, 7 March 2019 and 1 April 2019. Advisory Group members also provided ongoing written advice and feedback during the preparation of the Action Plan.

2. Stakeholder Roundtable
A roundtable of stakeholders was held on 12 November 2018. The aim of this full day workshop, facilitated by consultants, Communication Link, was to discuss the five priority areas as proposed by the Advisory Group. Participants formed groups and were asked to develop ideas around each proposed priority areas and suggest new priorities. These ideas were presented, discussed and synthesized into 60 discrete actions. These actions were then weighted and narrowed down to around a total of 30 actions.

More than 40 stakeholders participated in the roundtable, including representatives from Commonwealth and State and Territory Governments, consumers and consumer advocates, healthcare professionals, researchers, health economists, Aboriginal and Torres Strait Islander healthcare professionals and researchers, representatives from chronic disease organisations and kidney disease organisations, and representatives from private health insurance. A full list of participants is provided in Appendix 1.

3. Kidney Health Australia National Consumer Council
The Kidney Health Australia National Consumer Council (the Council) was formed in 2003 to provide a formal pathway for people living with kidney disease to gain visibility about issues and opportunities they are experiencing. It is also a mechanism for them to provide feedback to Kidney Health Australia on a wide range of topics. The Council works at a national level to make a positive impact on the lives of people affected by kidney disease. The current Council was convened in 2018 and includes 18 patients and carers with a broad lived experience of kidney disease. The members of the Council are listed in Appendix 1. Since January 2019, the Council has been chaired by Paolo Cardelli.

The draft priorities and actions arising from the roundtable were discussed with the Council during a Council meeting on 7 November 2018. A further meeting to discuss the draft online for a Stakeholder Survey was held on 12 December 2018. Council members also provided written feedback on the draft survey. Additional
meetings with the Chair of the Council were held in February and April 2019 to discuss the development of the plan and seek further feedback on actions items.

4. Online Stakeholder Survey
We developed an online Stakeholder Survey using the Survey Monkey platform. The Stakeholder Survey was based on actions proposed at the stakeholder roundtable, and input from the Council and Advisory Group. The Stakeholder Survey was open for public comment from 17 December 2018 to 31 January 2019. This survey asked participants to:

- review the five draft priority areas for action
- review draft objectives under each priority area
- express opinions on current areas of success and areas that require improvement in kidney health
- nominate the action respondents would most like to see included in the strategy.

The invitation to participate in the survey encouraged people to share it amongst their networks. The invitation to participate was distributed via:

- Electronic direct mail to 22,275 of Kidney Health Australia’s subscribers.
- Direct correspondence with Government departments and organisations (including Primary Health Networks, peak bodies and other kidney organisations and research organisations - Australian and New Zealand Society of Nephrology ANZSN, Transplant Society of Australia and New Zealand TSANZ, Australian Primary Health Care Nurses Association APNA, Renal Society of Australia RSA) who then shared the invitation through their networks.
- Advertisement through Kidney Health Australia’s social media channels (post reach 6536) and on the Kidney Health Australia website.

The response to the consumer consultation survey exceeded expectations, over 2,500 people (including consumers, healthcare professionals, researchers, policy makers and peak bodies) responded to the survey – 1,800 of those within the first 48 hours of the survey going live. This included 1,136 responses from patients and 554 from carers or family members. The response is testament to the level of engagement with the Action Plan by the kidney community.

The full results of this survey are provided in Appendix 2. In summary, there was high levels of support for the proposed priorities and actions, in particular the focus on prevention and research. Key additional themes were identified around financial and psychosocial support for people with kidney disease and carers. Financial hardship and mental health issues were consistently raised as key issue facing people with kidney disease. Analysis of the survey results led to several key amendments to the draft strategy, including reducing the number of priorities from five to three and increasing the focus on patient and carer support.

5. Individual Interviews
Representatives of State and Territory Governments
Kidney Health Australia conducted interviews with representatives from each state and territory health departments. This included representatives from Renal Clinical Networks, policy and program managers and healthcare practitioners.

Departments were contacted via email in August 2018, which included information about the development of the Action Plan, and interviews were conducted between September and November 2018. Topics covered during interviews included:

- Current kidney disease policies and programs, from prevention and treatment to financial and other support available.
- Areas where there are identified gaps in services, programs and policy.
- The highest priority areas identified for action.
A wide range of issues were covered including: successful models of care, workforce requirements, resource planning, gaps in service delivery, and a range of factors influencing patient quality of life.

A number of key themes emerged from these discussions, including:

- The need for consistency in quality of care across Australia including integrated care from diagnosis onwards and genuine choice in treatment options.
- The need for additional resources to expand dialysis capacity, with gaps identified in both metropolitan and regional areas.
- The challenges of delivering care in rural and remote areas, including Aboriginal and Torres Strait Islander communities.
- The importance of on-country care and community driven programs in Aboriginal and Torres Strait Islander communities.
- The financial impact of chronic kidney disease (CKD) on patients and families including transport costs, parking, inability to work and need for ongoing care.
- Lack of ongoing psychosocial/mental health support for patients and families.

**Aboriginal and Torres Strait Islander kidney health groups and individuals**

Kidney Health Australia engaged the Aboriginal and Torres Strait Islander community throughout the development of the Action Plan. The consultation included:

- National Aboriginal Community Controlled Health Organisation (NACCHO) and affiliated Aboriginal Community Controlled Health Organisations (ACCHOs)
- Aboriginal Medical Services Alliance Northern Territory (AMSANT)
- Purple House (Western Desert Ngaanampa Walytja Palyantjaku Tjutaku Aboriginal Corporation)
- Menzies School of Health Research
- The Lowitja Institute
- A registered nurse from the Aboriginal and Torres Strait Islander renal health workforce in Northern Australia
- The office of Minister Wyatt AM MP, Minister for Aged Care and Indigenous Health.

Detailed feedback and input was provided by NACCHO and affiliated ACCHOs and AMSANT regarding draft actions for inclusion in the strategy. Feedback focused on several key themes:

- The need for a comprehensive approach to prevention, including a strong focus on the social determinants of health, including food security, safe and affordable housing, intergenerational trauma and displacement, employment and child and maternal health.
- The need for targeted Aboriginal and Torres Strait Islander programs across each of the priority areas – participants stressed national prevention, detection and management programs are unlikely to be appropriate for Aboriginal and Torres Strait Islander communities.
- The need for programs to be developed by Aboriginal and Torres Strait Islander communities, in particular models of care and workforce programs.
- The importance of cultural safety in all policies and programs.
- The importance of on-country care and programs that help patients remain in their communities.

Discussions also focused on how the Action Plan would relate to a number of major pieces of work related to Aboriginal and Torres Strait Islander kidney disease recently undertaken.

- **The Commonwealth Government Aboriginal and Torres Strait Islander Renal Health Roadmap**
- The Transplant Society of Australia and New Zealand (TSANZ) Performance Report - *Improving Access to and Outcomes of Kidney Transplantation for Aboriginal and Torres Strait Islander People in Australia* (Appendix 3).
- **The Kidney Health Australia Caring for Australasians with Renal Impairment (KHA-CARI) Aboriginal and Torres Strait Islander Guidelines Community Consultation** (Appendix 4).
In response to all feedback, Kidney Health Australia raised the possibility of a separate Aboriginal and Torres Strait Islander Kidney Disease Strategy. This idea was not supported by NACCHO or AMSANT. Alternatively, Kidney Health Australia proposed that in addition to Aboriginal and Torres Strait Islander specific actions in each of the priorities, two main actions relating to Aboriginal and Torres Strait Islander kidney health be included under the objective of “Addressing the disproportionate burden of kidney disease on Aboriginal and Torres Strait Islander Communities”. These are:

1. Implement the Aboriginal and Torres Strait Islander Renal Health Roadmap.
2. Assist the National Indigenous Kidney Transplantation Taskforce (NIKTT) where required to implement the recommendations of the TSANZ Performance Report - Improving Access to and Outcomes of Kidney Transplantation for Aboriginal and Torres Strait Islander People in Australia.

This approach received broad support.

A number of Aboriginal and Torres Strait Islander healthcare organisations responded to the online survey, with respondents raising similar themes around prevention, the social determinants of health, Aboriginal and Torres Strait Islander specific programs, cultural safety, community development of programs and on country care. Respondents also identified a need for Aboriginal and Torres Strait Islander engagement in research.

Kidney Health Australia also consulted with Dr Jaquelyne Hughes from the Menzies Institute Research and programs from the Menzies School of Health Research and the Lowitja Institute, including the Catching Some Air - Asserting Indigenous Information Rights in Renal Disease (Appendix 5). The document is a targeted policy brief to Close the Gap in Aboriginal and Torres Strait Islander diabetes and kidney health. Dr Paul Lawton from the Menzies School of Health Research also provided feedback on the draft priorities and actions.

**Other experts**
The Action Plan was also presented and discussed with:

- The Organ and Tissue Authority
- Primary Care Education Advisory Committee for Kidney Health Australia (PEAK)
- TSANZ
- a range of healthcare professionals including nephrologists, dietitians, nurses and primary care professionals
- The Paired Kidney Exchange Program
- PKD Australia
- ANZSN.

Interviews with individual healthcare professionals provided additional information about specific actions, including integrated health checks and Medicare Benefit Schedule (MBS) items, telemedicine, transplantation, patient transport/travel and Aboriginal and Torres Strait Islander health initiatives.

The information collected from all these sources and in consultation with the Advisory Group led to the drafting of the Action Plan. This draft was then released for public consultation in early April 2019 via a second online survey.

The invitation to participate in the second online survey was distributed via:

- Direct correspondence to the 750 respondents who stated they wanted to provide feedback on the draft from the first online survey.
- Direct correspondence Government departments and organisations (including PHNs), peak bodies and research organisations who then shared the invitation through their networks.
- Direct correspondence to Kidney Health Australia National Consumer Council.
- A wide range of stakeholders identified during the prior consultations.
• Advertised on the Kidney Health Australia website.

Kidney Health Australia received 30 responses to the draft Action Plan. Responses were highly supportive of the identified priorities and actions overall, with feedback on wording and accessibility of language. Additional comments stressed the need for prevention and consumer support actions. Responses in relation to the actions related to Aboriginal and Torres Strait Islander initiatives recommended a national prevention agency with a remit beyond chronic disease and focused on the development and implementation of the Aboriginal and Torres Strait Islander Renal Health Roadmap, including a recommendation for greater focus on primary care in this report.

Following the final consultation Kidney Health Australia received additional written statements of endorsement from the following organisations:

• ANZSN
• APNA
• KidGen
• PKD Australia
• RSA
• TSANZ
### ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tbody>
<tr>
<td>ACCHOs</td>
<td>Aboriginal Community Controlled Health Organisations</td>
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<tr>
<td>AGHA</td>
<td>Australian Genomics Health Alliance</td>
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<tr>
<td>AMSANT</td>
<td>Aboriginal Medical Services Alliance Northern Territory</td>
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<td>ANZDATA</td>
<td>Australia and New Zealand Dialysis and Transplant Registry</td>
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<td>ANZSN</td>
<td>Australian and New Zealand Society of Nephrology</td>
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<td>APNA</td>
<td>Australian Primary Health Care Nurses Association</td>
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<tr>
<td>BEAT-CKD</td>
<td>Better Evidence and Translation – Chronic Kidney Disease</td>
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<td>CKD</td>
<td>chronic kidney disease</td>
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<tr>
<td>KHA-CARI</td>
<td>Kidney Health Australia Caring for Australasians with Renal Impairment</td>
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<tr>
<td>MBS</td>
<td>Medicare Benefits Schedule</td>
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<tr>
<td>NACCHO</td>
<td>National Aboriginal Community Controlled Health Organisation</td>
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<td>PEAK</td>
<td>Primary Care Education Advisory Committee for Kidney Health Australia</td>
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<tr>
<td>RSA</td>
<td>Renal Society of Australia</td>
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<tr>
<td>TSANZ</td>
<td>Transplant Society of Australia and New Zealand</td>
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APPENDICES

Appendix 1: Acknowledgements

Development of the Action Plan was led by Kidney Health Australia with funding from the Australian Commonwealth Government Department of Health. Development of the Action Plan took place from July 2018 to June 2019.

Kidney Health Australia would like to thank all individuals, organisations and government departments that have given their time and expertise to the development of this Action Plan. We would like to thank the members of the Advisory Group, the participants of the Roundtable on 12 November 2018, the Kidney Health Australia National Consumer Council, the Australian Government and State and Territory Government departments, the members of our kidney community, and the individuals who provided additional expert advice.

Advisory Group

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Kidney Health Australia Consumer Council

- Paolo Cardelli (Chair)
- Martin Chambers
- Dale Creely
- William Handke
- Shaun Johnson
- Peter Williams
- Mason Little
- Barry Mackinnon
- Fabian Marsden
- Wayne McGlone
- Luke Macauley
- David Morgan
- Dr Shyam Muthuramalingam
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Consultation Summary: A compendium to the National Strategic Action Plan for Kidney Disease
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**Expert Groups**

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- ANZDATA
- ANZSN
- APNA
- BEAT-CKD
- Deloitte Australia
- Diabetes Australia
- The George Institute for Global Health
- The Heart Foundation
- KidGen
- KHA-CARI Guidelines Group
- Kidney Health Australia National Consumer Council
- Menzies School of Health Research
- NACCHO
- PKD Foundation of Australia
- PEAK
- Purple House (Western Desert Nganampa Walytja Palyantjaku Tjutaku Aboriginal Corporation)
- RSA
- State Primary Health Networks
- The Stroke Foundation
- The Organ and Tissue Authority
- Top End Renal Services
- TSANZ
Australian Government Department of Health

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<tr>
<td>Rebecca Drew</td>
<td>Assistant Director, Indigenous Health Division</td>
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State and Territory Departments

- Australian Capital Territory – Department of Health
- Northern Territory – Health Policy and Strategy Division, Department of Health
- New South Wales – Agency for Clinical Innovation
- Queensland – System Planning Branch, Department of Health
- South Australia - Clinical Improvement and Engagement, SA Health
- Tasmania - CEO Public Health Services, Department of Health
- Victoria – Renal Clinical Network, Safer Care Victoria
- Western Australia – Department of Health
Appendix 2: Summary report of Stakeholder Survey

Contents

INTRODUCTION .............................................................................................................................. 155
METHOD AND ANALYSIS ............................................................................................................ 15
SUMMARY OF RESPONSES ........................................................................................................ 16
RESPONDENT CHARACTERISTICS ............................................................................................ 16

PRIORITY AREAS .......................................................................................................................... 17
 Priority one - prevention and early detection of kidney disease .................................................... 18
 Priority two - Improving the lives of people affected by kidney disease ................................. 20
 Priority three - Increasing organ donation and transplantation ............................................. 21
 Priority four - supporting high needs communities ................................................................. 23
 Priority five – increased focus on kidney research ................................................................. 24
 Areas of progress in kidney health ......................................................................................... 25
 Areas needing more progress in kidney health ..................................................................... 27
 Actions for inclusion in the Action Plan .............................................................................. 28

DISCUSSION ................................................................................................................................ 29

CONCLUSION ............................................................................................................................... 30

Introduction
A key component of this consultation process was an online public Stakeholder Survey seeking feedback on a range of proposed priorities and actions for addressing kidney disease in Australia, where the gaps are, and suggestions for what needs to be included in the Action Plan.

Method and analysis
The survey comprised 24 questions, provided via the Survey Monkey platform, including questions relating to demographics, draft priorities and actions and a number of free text questions relating to potential additional actions, areas of progress in kidney disease, areas needing improvement and the actions respondents would most like to see included in the Action Plan.

Under the five priority areas, respondents were instructed to rank each of the potential actions according to their perceived importance (noting that respondents might consider all of the actions important). The choice of ranking (rather than rating - i.e., asking participants to rate actions as very important, important, somewhat important etc) was designed to elicit preferences and avoid the possibility of every action being rated identically.

Analysis for the ranking questions included identifying the actions ranked ‘number one priority’ most frequently and allocating an overall/aggregate ranking score for each action. Aggregate scores, which take into account all rankings for each action from highest to lowest (i.e., the number of times each action is ranked 1, 2, 3, 4, ...) provide insight into the spread of priorities. Free text questions were analysed using thematic analysis. This involved each response being allocated an initial topic code followed by grouping of these codes into higher order themes.
Summary of responses
Over 2,500 people (including consumers, healthcare professionals, researchers, policy makers and peak bodies) responded to the survey – 1,800 of those within the first 48 hours of the survey going live. This included 1,136 responses from patients and 554 from carers or family members.

Respondent characteristics
Responses to survey came from both organisations and individuals. Respondents included people with kidney disease (44%), carers and families (21%) and healthcare professionals (24%) as well as researchers, policy makers, advocates and interested members of the public. Within healthcare professionals, nephrologists, nurses and renal nurses, dieticians, social workers and general practitioners were the main respondents.

Respondents included a wide range of ages - from under 18 to over 75. This included 35-44 (16%), 45-54 (23%), 55-64 (25%) and 65-74 (17%) and 75+ (6%). Responses came from all state and territories from a mix of urban, suburban, rural and remote areas. 74 respondents identified themselves as Aboriginal and Torres Islander.

Q1 Are you completing this survey as a? (choose as many as apply to you)
Priority areas
The survey included five key priority areas:

1. Prevention and early detection of kidney disease
2. Improving the lives of people affected by kidney disease
3. Increasing organ donation and transplantation
4. Supporting high needs communities
5. Increasing the focus on kidney research

Nearly all respondents agreed with these priorities. Respondents were asked if they wished to identify other priorities. Most responses overlapped with action items discussed in following questions relating to each of the priority areas. Main themes included:

1. Equity of access to care
2. The need for financial and other support
3. Social and emotional wellbeing
4. Advocacy
5. A focus on rural and remote services
6. Living donation
7. The importance of early education
8. Finding a cure for kidney diseases
9. Support for young adults with kidney disease

Respondents were then asked to rank individual actions for each priority area in order of importance, recognising that each action may be important. Respondents were also asked to nominate additional actions that felt should be included.

Priority one - Prevention and early detection of kidney disease

<table>
<thead>
<tr>
<th>Action items</th>
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<tbody>
<tr>
<td>1. Reducing the amount of salt and sugar in processed foods to improve overall health and reduce the risk of kidney disease and other chronic diseases.</td>
</tr>
<tr>
<td>2. Increasing the early detection of kidney disease and other chronic diseases by having a program where people risk of developing kidney disease are assessed in community settings, such as pharmacies and shopping centres.</td>
</tr>
<tr>
<td>3. Increasing the early detection of kidney disease and other chronic diseases by having a chronic disease health check by GPs.</td>
</tr>
<tr>
<td>4. Having a national awareness and education campaign to improve the early detection of kidney disease for both the general public and General Practice.</td>
</tr>
<tr>
<td>5. Having a national agency to lead chronic disease prevention in Australia.</td>
</tr>
</tbody>
</table>

Overall, prioritisation of these actions was fairly even across the six actions items. Increasing early detection through a chronic disease check was ranked number one by 28% of respondents and received the highest aggregate score, followed by the national awareness campaign and risk assessment items. The national chronic disease prevention agency and genetic testing ranked slightly lower.
Proposed additional items
Respondents also proposed additional actions. Main themes include:

1. Increasing awareness of CKD – including the role of kidneys, risk factors, the potential impact of medications on kidney function, comorbidities (in particular diabetes).
2. Education – within primary care to increase detection, built into the school curriculum and for people with early stage disease.
3. Increased focus on lifestyle modification – addressing obesity, alcohol consumption and smoking, including access to diet and exercise advice and support.
4. Screening – ranging from high risk populations, at birth and school aged children to general population screening.
5. Focusing on social determinants and kidney disease in Aboriginal and Torres Strait Islander communities.
## Priority two - Improving the lives of people affected by kidney disease

### Action items

1. Helping with transport costs for people traveling to dialysis.
2. Providing programs to support carers including education, counselling and respite care.
3. Reducing the cost of home dialysis, including help with utility costs and providing carers leave for home dialysis training.
4. Having national agreements with dialysis units in hospitals so that people traveling interstate for work or holidays have easy access to dialysis.
5. Creating and supporting peer support networks (virtual and face to face) across Australia for people affected by kidney disease.
6. Providing resources such as telephone support, online information and other materials to help patients make decisions about their treatment options.

Help with costs of dialysis, such as transport and utilities was the most prioritised action, with over 35% of people ranking this action most highly. This was followed by making it easier for people to travel while on dialysis, mental health and carer support programs. Again, overall prioritisation was fairly evenly spread across the proposed actions.

#### Q12 Recognising that each of these objectives may be important, over the next 2-5 years which objectives would you rate as most important to address?

- **Helping with costs of dialysis, including transport costs for people traveling to dialysis and utility costs for home dialysis**
- **Providing programs to support carers including education, counselling, respite care and providing carers leave for home dialysis training**
- **Having national agreements with dialysis units in hospitals so that people traveling interstate for work or holidays have easy access to dialysis**
- **Creating and supporting peer support networks (virtual and face to face) across Australia for people affected by kidney disease**
- **Providing resources such as telephone support, online information and other materials to help patients make decisions about their treatment options**
- **Making mental health a key part of kidney disease treatment**

<table>
<thead>
<tr>
<th>Objective</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helping with costs of dialysis, including transport costs for people traveling to dialysis</td>
<td>40%</td>
</tr>
<tr>
<td>Providing programs to support carers including education, counselling, respite care and providing carers leave for home dialysis training</td>
<td>30%</td>
</tr>
<tr>
<td>Having national agreements with dialysis units in hospitals so that people traveling interstate for work or holidays have easy access to dialysis</td>
<td>20%</td>
</tr>
<tr>
<td>Creating and supporting peer support networks (virtual and face to face) across Australia for people affected by kidney disease</td>
<td>20%</td>
</tr>
<tr>
<td>Providing resources such as telephone support, online information and other materials to help patients make decisions about their treatment options</td>
<td>20%</td>
</tr>
<tr>
<td>Making mental health a key part of kidney disease treatment</td>
<td>20%</td>
</tr>
</tbody>
</table>
Proposed additional items
Respondents also proposed additional actions, some of which overlapped with the actions outlined in the survey. Main themes include:

1. Increased financial support for patients and carers, such as access to the Commonwealth Carers Allowance and the National Disability Support Scheme.
2. Easier access to psychosocial support for patients and carers, such as access to social workers and mental health during key points in patient pathways.
3. Providing more resources to health services to deliver better, more flexible care, including increasing the number of dialysis chairs, better access to home dialysis, better advanced care planning.
4. A focus on Aboriginal and Torres Strait Islander care, including on country care, housing and travel support.
5. Improving transport assistance programs for people traveling for care.
6. Better ongoing education at all stages of kidney disease to allow people to make informed decisions about their care.
7. Making it possible for people on dialysis to travel.

Priority three - Increasing organ donation and transplantation

<table>
<thead>
<tr>
<th>Action items</th>
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<tbody>
<tr>
<td>1. Increasing deceased donation by changing the current “opt in” organ donation consent policy for deceased organ donation to a different model such as presumed consent /“opt out.”</td>
</tr>
<tr>
<td>2. Having programs to increase the number of live donor transplants such as an education and awareness campaign and a living kidney donor advocates program (for both living donation and paired donor exchange programs).</td>
</tr>
<tr>
<td>3. Improving access to transplants by removing barriers to identifying, working-up, referring, assessing and listing patients for kidney transplantation.</td>
</tr>
<tr>
<td>4. Making transplants more equitable by developing transparent, nationally consistent guidelines for recipient eligibility to reduce the variability in transplantation rates across different parts of Australia.</td>
</tr>
<tr>
<td>5. Improving transplant outcomes by having transplant specialist outreach (e.g. outreach clinics, telehealth), to help support people post-kidney transplant.</td>
</tr>
<tr>
<td>6. Improving patient outcomes by developing nationally consistent care pathways for transplantation, including before and after surgery to improve transplant outcomes.</td>
</tr>
</tbody>
</table>
Of the six proposed actions, respondents prioritised increasing deceased donation rates through changing to an “opt out” system most highly, with 40% of respondents ranking this action highest priority. Programs to increase live donations and identifying barriers to getting listed for donation were the next highest priorities.

**Proposed additional items**

Proposed additional actions focused on six areas:

1. Public education about both deceased and living donation.
2. Increased support for live donors (financial, medical, ongoing follow up) and deceased donor families.
3. More resources to be directed to transplants.
4. Increasing research into stem cells, artificial kidney and research to improve transplant outcomes.
5. Pre and post-transplant education and support, including accommodation and travel support for transplant recipients.
6. Improving transplant access outcomes for Aboriginal and Torres Strait Islander kidney patients.
Priority four – Supporting high needs communities
This priority area focused on high needs communities such as Aboriginal and Torres Strait Islander populations, cultural and linguistically diverse communities, regional and remote communities and young people.

Action items

1. Increasing the number of health workers in Indigenous and regional and remote communities.

2. Investigating other ways to provide health care in high needs communities, such as “on country care” to allow Indigenous patients to access care close to home.

3. Expanding successful prevention and detection programs in high needs communities to increase awareness and early detection of kidney disease and other chronic diseases.

4. Introducing a nationally consistent model to improve the transition from paediatric to adult care for adolescents with kidney disease.

5. Funding the necessary infrastructure (buildings and equipment) and training to expand the use of telemedicine to provide better care in regional and rural areas.

6. Having programs to provide transplantation of Indigenous and other high risk groups individuals with end-stage kidney disease in a culturally safe environment.

Over 32% respondents ranked expanding successful prevention and detection programs as highest priority, followed by the actions relating to increasing the workforce and investigating alternative care models in indigenous and rural and remote communities.
**Proposed additional items**

Other actions nominated focused on several interrelated themes including:

1. Self-determination as a fundamental principle of Aboriginal and Torres Strait Islander kidney health – the importance of programs being developed with/by Indigenous communities.
2. Social determinants – addressing the root causes of chronic disease including food security, housing, education, child and maternal health, racism and dispossession.
3. Developing models of care and workforce tailored to individual high needs communities – including upskilling local healthcare workers in rural and remote communities.
4. Prevention and education tailored to individual high needs communities – including Aboriginal and Torres Strait Islander communities, young adults, culturally and linguistically diverse groups and varying education levels.
5. Increasing funding for rural and remote services – to increase access to dialysis and specialist care and provide on-country care for Aboriginal and Torres Strait Islander people.

**Priority five – Increased focus on kidney research**

<table>
<thead>
<tr>
<th>Action items</th>
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<tbody>
<tr>
<td>1. Developing a national unified Australian kidney disease research strategy to set the priorities for kidney research over the next decade.</td>
</tr>
<tr>
<td>2. Increasing the amount of kidney research done in Australia by providing more research funding and career support for researchers.</td>
</tr>
<tr>
<td>3. Increasing the role of consumers in kidney research and clinical trials through a virtual online ‘hub’ where consumers and researchers can interact.</td>
</tr>
<tr>
<td>4. Funding research that consumers identify as priorities, such as research into treating symptoms and side effects of treatment.</td>
</tr>
<tr>
<td>5. Funding and having nationally consistent data collection at all points of care to support ongoing improvements in kidney disease prevention, detection and management.</td>
</tr>
<tr>
<td>6. Developing systems for reporting patient outcomes and experiences to improve health services and care.</td>
</tr>
</tbody>
</table>

The actions proposing developing a national kidney disease strategy and increasing funding and support for kidney research and researchers were the highest ranked priorities overall, ranked number one priority by 24% and 27% of respondents respectively. Funding research prioritised by consumers and nationally consistent data were also ranked highly with the proposed consumer hub and patient reported outcomes (PROMs) ranked lower.
Proposed additional items
Respondents proposed a large number of additional actions for the research priority covering several main themes. These include:

1. Increased focus on various specific areas of research – stem cell, paediatrics, psychosocial, artificial kidneys, comorbidities, basic research, translational research, improving dialysis, quality of life, genetic kidney diseases, transplant.

2. Linking Australian research with research programs in other countries.

3. Targeting research at the most at risk populations, including Aboriginal and Torres Strait Islander people, with research being conducted with and by Aboriginal and Torres Strait Islander researchers.

4. Improving research quality and a focus on evidence.

5. Increased/stable research funding.

Areas of progress in kidney health
Respondents were asked to nominate up to five areas where they have seen or experienced significant progress or success in the area of kidney health. Responses overwhelmingly focused on a number of key areas. These included:

Donation and Transplantation
Respondents identified improvements in the following areas:

- increased deceased donation awareness and consent
- increased living donation and support for living donors
- increased number transplants performed
- increased paired exchange
- better and earlier access to transplant as a treatment option
• improvements in pre and post-transplant education
• improvements in transplant outcomes including improvements in medication regimes.

Several respondents described marked differences in their experiences having multiple transplants over several decades, noting improvements in preparation for transplants, in-hospital stays, support and outcomes.

Dialysis
Respondents identified improvements in the following areas:
• home dialysis, including increasing availability, better support and education and improvements in dialysis machines
• increased number of dialysis chairs, improving access particularly in regional and rural areas
• advances in technology resulting in improved machines
• increased choice and flexibility in dialysis treatments
• improvements in dialysis experience at clinics, including better education and support.

Quality of care
Respondents identified improvements in the following areas:
• improvements in continuity of care and multidisciplinary care
• improvements in primary care treatment
• better access to specialist care
• improvements in healthcare professional communication
• increased focus on treating co-morbidities
• highly skilled specialists and nurses
• paediatric to adult transition
• increasing focus on conservative care
• better symptom managements
• improvements in medication
• increased access to telehealth
• psychosocial support.

Respondents also identified improvements in:
• public awareness of CKD and focus on prevention
• education about CKD management and treatment options including increased availability of online resources
• increasing focus on the role of diet in preventing and managing CKD, including access to dieticians, support and advice
• advances in the detection, diagnosis and treatment of inherited kidney diseases
• advances in research, particularly stem cell research, artificial kidneys and increased patient participation in clinical trials
• improvements in access to and quality of care in Aboriginal and Torres Strait Islander communities.
Areas needing more progress in kidney health
Respondents were also asked to nominate up to five areas needing more progress. Many of the areas identified were similar to those nominated as areas of progress. These include:

Donation and transplant
A significant number of responses related to changing the deceased donation system from ‘opt in’ to ‘opt out’. Other responses related to improvements in availability of organs, greater awareness of donation, transplant waiting times, transplant work up and outcomes and support for living donors.

Research
Behind donation and transplantation, research was consistently identified as an area requiring more progress. Respondents nominated increased research funding in general as well as specific areas of research, such as stem cell research, artificial kidneys, preventions, symptom management and improvements in treatment. Respondents also identified a need for great consumer involvement in research.

Awareness and education
Respondents identified a need for improvements in the following areas:
- public awareness of CKD
- school based education
- early education for people with CKD and their families
- education about lifestyle modification, in particular diet
- pre dialysis education
- education about treatment options
- education of health professionals to improve detection and
- more easily accessible/understandable patient education overall.

Dialysis access
Respondents identified a need for better dialysis access, including more units in hospitals, dialysis closer to home, more dialysis in the home and appropriate support for home dialysis and access to dialysis while on holiday.

Patient and carer support
Respondents identified a need for improvements in the following areas:
- mental health/psychosocial support during all stages of CKD, including easier access to social workers and mental healthcare professionals
- financial support for patient and carers, including access to NDIS, medication subsidies
- transport support for dialysis and transplant work up and post-transplant follow up
- accommodation support for those undergoing transplants
- in home support for home dialysis patient and carers
- national patient and carer networks for peer to peer support
- more support for paediatric to adult transition workplace support for people with CKD.

Quality of care
Respondents identified a need for improvements in the following areas:
- more continuity of care
- better communication between the various health professionals providing carer
- better communication between healthcare professionals and patients
- increased treatment choices
• improved symptom management
• better access to dieticians to help manage early stage disease and during dialysis

Prevention and detection
The key theme of responses related to prevention was the need to reduce salt and sugar in food, including the introduction of a sugar tax. Others areas nominated including an increased focus on the social determinants of health, the need for early access to allied healthcare such as dieticians and counsellors to support lifestyle modification and education. A number of respondents identified a need for government funded access to invitro fertilisation and pre-implantation testing for people carrying inherited kidney diseases.

Within the theme of detection, responses related to the need for better detection in primary care, including ongoing monitoring of at risk patients and increased testing. Responses also related to the need for better detection of inherited disease through genetic testing.

Rural and remote and Aboriginal and Torres Strait Islander care
Respondents identified a need for increased resources in rural and remote areas, including increased access to dialysis and staff such as specialists, nurses, mental health professionals, social workers and allied health. A key theme of responses was equity for rural and remote patients.

In addition, respondents identified a number of key areas requiring improvement related to Aboriginal and Torres Strait Islander health. These include:
• providing culturally safe care and greater involvement of communities in developing and delivering models of care
• increasing the Aboriginal and Torres Strait Islander health workforce
• addressing the social determinants of health
• additional funding for Aboriginal and Torres Strait Islander Health Services.

Actions for inclusion in the Action Plan
Respondents were asked to nominate the action they would most like to see included in the action plan. The actions nominated unsurprisingly reflect the areas identified as in need of more progress above. These include:

1. Donation and transplantation initiatives – in particular a move to an opt out deceased donation system.
2. Research – in particular stem cell and artificial kidney research as well as improved treatments.
3. Awareness and education programs – for the general public, school children, people with CKD and carers and primary care.
4. Prevention and detection – in particular a focus on reducing salt and sugar in food and improved access to lifestyle modification programs and supporting health professionals such as dieticians.
5. Financial and psychosocial support programs – including access to carer’s allowance, NDIS, mental health and social worker support, transport and accommodation subsidies, peer support.
6. Increased focus on research – including stem cell and artificial kidneys, symptom management, prevention and increased consumer involvement in research.
7. Improved quality of care – in particular greater continuity of care, consistency of care, better communication, and a focus on quality of life.
8. Aboriginal and Torres Strait Islander care – with a focus on addressing the social determinants of health, community led care, cultural safety and culturally appropriate care.
9. Rural and remote care – such as dialysis access closer to home and reducing the disparity between the quality of rural and metropolitan care.
Themes underpinning these proposed actions were the need for increased resources to address kidney disease, the importance of nationally consistent and equitable care and a patient centred approach to programs.

Discussion
The findings from the survey informed the Action Plan for Kidney Disease. The considerable response to the survey demonstrates the kidney community’s high level of engagement and investment in the Action Plan and the results of the survey indicate support for the broad priorities and actions propose. The findings also suggest that greater emphasis should be placed on a number of key areas. These in include:

Awareness, education and early detection
Raising awareness of kidney disease needs to include both broad community awareness raising and targeted campaigns to reach at risk population groups. Respondents noted a lack of understanding of the function of the kidneys and the seriousness of disease before being diagnosed with CKD. Many unfavourably compared the high levels of community knowledge of and attitudes to cancer with the overwhelming lack of awareness of kidney disease, one respondent suggesting the need to “make kidney disease as scary as cancer is” in the community. Respondents also nominated school-based education as a key component of awareness raising.

Beyond broad community programs, respondents stressed the need for ongoing education about kidney disease to help manage the condition at every stage and help them make informed decisions about care. In addition, more education for primary care practitioners is key to increasing early detection.

A national approach and equitable access to care and support
Responses identified significant disparities in access to and the quality of care across Australia. Differences in resources allocated, models of care and support programs across the various states and territories results in often marked differences in the care delivered to people with kidney disease, particularly in rural and remote communities. This includes support programs, such as patient transport and accommodation assistance schemes, utilities subsidies and home support. Beyond state and territory boundaries, there are perceptions of inconsistencies between the care delivered in different hospitals and primary care settings, with quality varying dependent on individual physicians. These variations highlight the need for nationally consistent standards of care and equity in the range of state based support programs.

Improved support
The need for better support for people with kidney disease and carers was consistently raised throughout the survey. Respondents stressed the financial and mental toll of CKD on patients, carers and families exacerbated by a lack of access to the National Disability Scheme and the carer allowance. End stage kidney disease (ESKD) appears to fall between the cracks in financial support programs, with program criteria failing to take into account the debilitating nature of ESKD and the ongoing treatment requirements, frequently necessitating a full time carer. In addition support such as access to ongoing psychosocial support, advice and assistance with bureaucratic processes associated with ongoing treatment has the potential to make significant improvements in the lives of people affected by CKD. As one respondent noted, a simple phone call by a social worker to regularly “check in” with a patient or carer would help people affected by CKD feel less alone.

Research
Participants consistently stressed the importance of research for the kidney community, including research focused on finding cures for kidney disease such as stem cell research and artificial kidneys. Respondents also showed a high level of interest in both participating in research and being actively involved in setting research directions. However beyond stem cell and artificial kidney research there was little consensus about which
areas of research should be prioritised and a wide range of focus areas were nominated by all types of respondents including researchers, healthcare professionals, patients, carers and family members. The importance respondents placed on research combined with this lack of agreement about priorities highlights the need for a coordinated kidney research program underpinned by clear priorities.

**Organ donation and transplantation**

Deceased organ donation was a key priority for respondents with a significant number of respondents called for moving to a presumed consent or “opt out” deceased donation system to increase the availability of organs for transplant. Others called for more awareness of deceased donation and concerted campaigns to raise deceased donation rates. Another key focus was equity of access, including transparent processes for being wait listed for a transplant and more support for rural and remote and Aboriginal and Torres Strait Islander people.

Several recent reviews into donation and transplantation – *The Review of Organ Donation, Retrieval and Transplantation System* - undertaken by the Department of Health for all governments through the Council of Australian Governments Health Council (CHC) and the *TSANZ Performance Report – Improving Access to and Outcomes of Kidney Transplantation for Aboriginal and Torres Strait Islander People in Australia* – will be integral to addressing these areas.

**Conclusion**

The development of a national strategy for kidney disease is an important opportunity to change the trajectory of kidney disease in Australia. The survey has provided invaluable insight into the experiences of those affected by kidney disease and challenges facing the health sector and governments to prevent and manage CKD. Together with the extensive consultation undertaken, the evidence collected and the stocktake of existing initiatives, the survey findings will form the basis of a strategy that reflects the needs of the Australian kidney community.
Appendix 3: The Transplantation Society of Australia and New Zealand (TSANZ) Performance Report - Improving Access to and Outcomes of Kidney Transplantation for Aboriginal and Torres Strait Islander People in Australia
Improving Access to and Outcomes of Kidney Transplantation for Aboriginal and Torres Strait Islander People in Australia

Performance Report
# Table of Contents

**ACKNOWLEDGEMENTS** ........................................................................................................................................ IV
**ABBREVIATIONS** .......................................................................................................................................... V
**TERMINOLOGY** ............................................................................................................................................. VI

**EXECUTIVE SUMMARY** .................................................................................................................................. VII

## 1. **INTRODUCTION** ....................................................................................................................................... 8

1.1 **ORGAN DONATION** .............................................................................................................................. 10

1.2 **PRE- AND POST-TRANSPLANT BARRIERS** .......................................................................................... 11

1.3 **AIMS OF THIS REPORT** ....................................................................................................................... 12

1.4 **STRUCTURE OF THIS REPORT** ........................................................................................................... 12

## 2. **CURRENT EVIDENCE** .......................................................................................................................... 13

2.1 **CONSUMER ENGAGEMENT** .................................................................................................................. 13

- 2.1.1 Catching Some Air – Asserting Indigenous Information Rights in Renal Disease .................. 13

- 2.1.2 Kidney Health Australia’s Indigenous Community Consultations ............................................ 14

- 2.1.3 Indigenous Patient Voices Symposium ......................................................................................... 14

- 2.1.4 Indigenous knowledge in health services: a consumer partnership framework ..................... 15

- 2.1.5 Patient-led Participatory Action Research (PAR) Project .............................................................. 15

- 2.1.6 IMPAKT ............................................................................................................................................. 16

- 2.1.7 Managing Two Worlds Together .................................................................................................... 17

- 2.1.8 Where to next? .................................................................................................................................. 17

2.2 **PRE-TRANSPLANT JOURNEY** ................................................................................................................ 18

- 2.2.1 Information sharing and understanding the transplantation process ........................................ 19

- 2.2.2 Completing transplant workup tests and formal assessment ...................................................... 22

- 2.2.3 Staying healthy on the list ............................................................................................................... 26

- 2.2.4 Surgical assessment ....................................................................................................................... 26

2.3 **POST-TRANSPLANT REQUIREMENTS** ............................................................................................... 32

- 2.3.1 Models of Care .................................................................................................................................. 33

- 2.3.2 Immunosuppression ....................................................................................................................... 40

- 2.3.3 Infective Prophylaxis ...................................................................................................................... 45

2.4 **CRITIQUE OF CURRENT EVIDENCE** .................................................................................................. 46

2.5 **ENHANCING DATA COLLECTION & REPORTING** ........................................................................ 47

- 2.5.1 Facility selection ............................................................................................................................. 48

- 2.5.2 Patient selection ............................................................................................................................. 49

- 2.5.3 Data collection .................................................................................................................................. 49

- 2.5.4 Feasibility and resourcing .............................................................................................................. 50

- 2.5.5 Other data linkage and research projects ....................................................................................... 51

## 3. **PRE-TRANSPLANT KNOWLEDGE GAPS AND RECOMMENDATIONS** ........................................... 52

3.1 **KNOWLEDGE AND DATA GAPS** ......................................................................................................... 52

- 3.1.1 Informing patients ........................................................................................................................... 52

- 3.1.2 Completing workup and assessment ............................................................................................... 52

- 3.1.3 Surgical assessment ....................................................................................................................... 53

3.2 **NEXT STEPS AND RECOMMENDATIONS FOR RESEARCH, PRACTICE AND POLICY** ............. 54

- 3.2.1 Consumer Engagement and Education ........................................................................................ 54

- 3.2.2 Improving Equity and Access to Transplant Services .................................................................. 55

- 3.2.3 Researching, Developing and Implementing Clinical Guidelines and Protocols ...................... 58

- 3.2.4 Workforce Training and Development ........................................................................................ 59
4. POST-TRANSPLANT KNOWLEDGE GAPS AND RECOMMENDATIONS .............................................. 60
   4.1 KNOWLEDGE AND DATA GAPS .......................................................................................... 60
       • 4.1.1 Models of Care ........................................................................................................... 60
       • 4.1.2 Immunosuppression .................................................................................................... 61
       • 4.1.3 Infective Prophylaxis .................................................................................................. 61
   4.2 NEXT STEPS AND RECOMMENDATIONS FOR RESEARCH, PRACTICE AND POLICY .......... 63
       • 4.2.1 Consumer Engagement and Education ........................................................................ 63
       • 4.2.2 Improving Equity and Access to Transplant Services .................................................. 64
       • 4.2.3 Researching, Developing and Implementing Clinical Guidelines and Protocols .............. 66

5. SUMMARY .................................................................................................................................. 69

APPENDIX A TABLE OF SYSTEMIC BIASES ................................................................................. 73
APPENDIX B BELATACEPT TRIALS ............................................................................................. 76
APPENDIX C PROPHYLAXIS PROTOCOL ..................................................................................... 77
REFERENCES .................................................................................................................................. 79
Acknowledgements

In June 2018, the Minister for Indigenous Health, the Hon Ken Wyatt MP, commissioned an expert panel, led by the Transplantation Society of Australia and New Zealand (TSANZ), to undertake a comprehensive review into the hurdles, service gaps and practical challenges faced by Aboriginal and Torres Strait Islander patients receiving treatment for kidney disease. A number of expert panel members served on pre- and post-transplant Aboriginal and Torres Strait Islander working groups and contributed to this report, including: Stephen McDonald (Convener), Toby Coates (TSANZ President Elect), Peter Boan, Alan Cass, Steve Chadban, Ross Francis, David Goodman, Jaquelyne Hughes, Ashley Irish, Sarah Jones, Wai Lim, William Majoni, Murty Mantha, Olivia O’Donoghue, Greg Perry, Christine Russell, Cherian Sajiv and Paul Snelling. Other expert panel members provided constructive comments and review, including: Stephen Alexander, Lucinda Barry, Shilpa Jesudason and Lisa Murphy.

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### Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
</tr>
<tr>
<td>ACCHS</td>
<td>Aboriginal Community Controlled Health Services</td>
</tr>
<tr>
<td>ACSQHC</td>
<td>Australian Commission on Safety and Quality in Health Care</td>
</tr>
<tr>
<td>AIATSIS</td>
<td>Australian Institute of Aboriginal and Torres Strait Islander Studies</td>
</tr>
<tr>
<td>AIHW</td>
<td>Australian Institute of Health and Welfare</td>
</tr>
<tr>
<td>ANZDATA</td>
<td>Australia and New Zealand Dialysis and Transplant Registry</td>
</tr>
<tr>
<td>ANZSN</td>
<td>Australian and New Zealand Society of Nephrology</td>
</tr>
<tr>
<td>CKD</td>
<td>chronic kidney disease</td>
</tr>
<tr>
<td>CVD</td>
<td>cardiovascular disease</td>
</tr>
<tr>
<td>DoH</td>
<td>Commonwealth Department of Health</td>
</tr>
<tr>
<td>ESKD</td>
<td>end-stage kidney disease</td>
</tr>
<tr>
<td>eGFR</td>
<td>estimated glomerular filtration rate</td>
</tr>
<tr>
<td>HD</td>
<td>haemodialysis</td>
</tr>
<tr>
<td>HLA</td>
<td>human leukocyte antigen</td>
</tr>
<tr>
<td>KHA</td>
<td>Kidney Health Australia</td>
</tr>
<tr>
<td>MBS</td>
<td>Medicare Benefits Schedule</td>
</tr>
<tr>
<td>NRHA</td>
<td>National Rural Health Alliance</td>
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<tr>
<td>OTA</td>
<td>Organ and Tissue Authority</td>
</tr>
<tr>
<td>PBS</td>
<td>Pharmaceutical Benefits Scheme</td>
</tr>
<tr>
<td>PD</td>
<td>peritoneal dialysis</td>
</tr>
<tr>
<td>PNP</td>
<td>patient navigator program</td>
</tr>
<tr>
<td>POCT</td>
<td>point of care testing</td>
</tr>
<tr>
<td>RRT</td>
<td>renal replacement therapy</td>
</tr>
</tbody>
</table>
Terminology

**Bariatric surgery**: Comprises a variety of procedures that reduces the size of the stomach and is performed on people who have obesity to achieve weight loss.

**Comorbidity**: The co-occurrence of one or more disorders in the same individual, either at the same time or in some causal sequence.

**Culturally appropriate care**: Involves the delivery of patient-centred care that is tailored to meet the social, cultural and linguistic needs of the patient.

**Diabetes**: A group of diseases that result in too much sugar in the blood (high blood glucose). Type 2 diabetes accounts for 85% of all diabetes and is increasing at the fastest rate, primarily due to the obesity epidemic.

**Dialysis**: An artificial method of removing waste substances from the blood and regulating levels of circulating chemicals—functions normally performed by the kidneys.

**End-stage kidney disease (CKD stage 5)**: The most severe form of CKD and requires RRT to survive (defined as eGFR <15 mL/min/1.73 m² or on dialysis). Symptoms include nausea, itching skin, restless legs and shortness of breath. Additional common complications include inflammation of the tissue layers surrounding the heart, bleeding in the gastrointestinal tract, altered brain function and structure, and disturbances or structural or functional changes in the peripheral nervous system.

**Health literacy**: The degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions.

**HLA matching**: HLA molecules are expressed on almost all nucleated cells, and they are the major molecules that initiate graft rejection in organ transplant recipients. HLA matching involves blood or tissue samples being tested before a donor stem cell or organ transplant to find out if tissues are immunologically compatible between the donor and the recipient.

**HLA sensitisation**: Occurs when patients develop anti-HLA antibodies, primarily via pregnancy, transfusion and/or prior transplant. If not adequately suppressed, the presence of such antibodies can lead to early graft loss in kidney transplant recipients.

**Kidney transplant**: A healthy kidney is taken from one person and surgically placed into someone with ESKD. The kidney can come from a live or deceased donor. Transplantation is widely regarded as the preferred treatment for people with ESKD.

**Immunosuppression**: A reduction of the activation or efficacy of the immune system to prevent the rejection of a transplant.

**Pharmacogenetics**: The study of inherited genetic differences in drug metabolic pathways that can affect individual responses to drugs, both in terms of therapeutic and adverse effects.

**Prophylaxis**: Measures designed to preserve health and prevent the spread of disease or infection.
Executive Summary

End-stage kidney disease (ESKD) is a serious and increasingly common health problem in Australia. Indigenous people, especially those who live in remote communities, have a much greater risk of developing ESKD and requiring dialysis treatment, but their likelihood of receiving a kidney transplant is substantially lower than that of non-Indigenous patients. For those who are fortunate enough to receive a kidney transplant, a disparity between Indigenous and non-Indigenous patients persists, with Indigenous kidney transplant recipients experiencing significantly worse post-transplant outcomes compared to non-Indigenous recipients. In June 2018, the Minister for Indigenous Health, the Hon Ken Wyatt MP, established an expert panel, comprised of people working in clinical settings, research and public policy, to investigate and identify barriers faced by Indigenous people in accessing and maintaining a kidney transplant. This Performance Report constitutes the first piece of work produced by the expert panel, as commissioned by the Commonwealth Department of Health (DoH). The Report complements the EY Review of the Australian organ donation, retrieval and transplantation system and provides a detailed analysis of available evidence around:

1. Evidence and gaps around steps to waitlisting and to long term transplant function;
2. Improving Indigenous dialysis patients’ health to improve their capacity to be listed; and
3. Measures to address these gaps.

Box 1: Priority recommendations for immediate implementation

Of the report’s 35 evidence-based recommendations, the expert panel has identified three key areas that should receive prioritisation for funding and immediate action. These include:

1. **Establishing a resourced National Indigenous Kidney Transplantation Taskforce**, with representations from DoH, TSANZ, ANZDATA, ANZSN, OTA and invited subject experts, to drive the implementation of the report’s recommendations, consult the Indigenous and health care communities, and advocate for equitable access to transplantation for Indigenous patients.
2. **Enhancing data collection and reporting** processes on pre- and post-transplant outcomes by:
   a. Implementing a 12-month pilot project to capture additional pre- and post-kidney transplant data points in an expanded ANZDATA data collection protocol;
   b. Incorporating a specific chapter in the ANZDATA annual report on kidney transplantation among Aboriginal and Torres Strait Islander people; and
   c. Undertaking additional data linkage and research projects that target Indigenous patients’ post-transplant outcomes, enabling identification of best practice immunosuppression, infective prophylaxis and vascular complication protocols.
3. **Improving the equity and accessibility of transplantation** for Indigenous patients by:
   a. Establishing an Indigenous reference group in every transplant unit to help design pathways and models of care that are culturally appropriate;
   b. Trialling the adoption of patient navigators as part of pre-transplant care protocols;
   c. Evaluating and leveraging existing initiatives that target cultural bias in health services to facilitate the rollout of best practice pre-transplant care and support interventions for Indigenous transplant candidates; and
   d. Trialling a multidisciplinary pre- and post-transplant clinic in one major regional centre for 12 months, prioritising the availability of dental and cardiac services, as well as travel and accommodation support for rural and remote patients.
Introduction

The Aboriginal and Torres Strait Islander peoples of Australia (hereafter referred to as Indigenous Australians) are culturally, linguistically and geographically diverse. Over 250 Indigenous Australian cultural and language groups covered the continent at the time of European settlement in 1788, though only an estimated 120 of these survive today (AIATSIS, 2018). While they make up only 3% of the total Australian population, in 2011 45% of people living in very remote areas and 16% of people living in remote areas were Indigenous (AIHW, 2015). A range of sociodemographic factors are linked to health inequalities and poorer health care outcomes for Indigenous peoples, including:

- Lower levels of education, employment, income and poorer quality housing, on average, compared with non-Indigenous Australians;
- Higher rates of behavioural and biomedical risk factors, such as smoking, risky alcohol consumption, poor diet, lack of exercise, and higher rates of high blood pressure; and
- Difficulties in accessing affordable and culturally appropriate health services.

The gap in life expectancy between Indigenous and non-Indigenous Australians remains significant, as shown in Table 1, with around a 10-year discrepancy for both males and females. In 2016, nearly three in four (71%) of Indigenous deaths were from chronic diseases, including cancer, diabetes and chronic kidney disease (CKD) ("Healthy Lives: Life Expectancy Target," 2018).

**Table 1: Life expectancy at birth ("Healthy Lives: Life Expectancy Target," 2018).**

<table>
<thead>
<tr>
<th>Year-Range</th>
<th>Indigenous</th>
<th>Non-Indigenous</th>
<th>Gap (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>Females</td>
<td>Males</td>
<td>Females</td>
</tr>
<tr>
<td>2005-2007</td>
<td>67.5</td>
<td>73.1</td>
<td>78.9</td>
</tr>
<tr>
<td>2010-2012</td>
<td>69.1</td>
<td>73.7</td>
<td>79.7</td>
</tr>
</tbody>
</table>

Chronic kidney disease is a significant and rapidly growing public health problem that manifests in substantial burden of illness and premature mortality worldwide. CKD is gradual and progressive and comprises five recognised stages. Stage 1 is the mildest and typically symptom free, while Stage 5 is the point where kidney function causes very substantial symptoms and complications and ultimately is incompatible with life unless renal replacement therapy (RRT), comprising dialysis or transplantation, is undertaken (AIHW, 2011a). Intervention to avoid or reduce the impact of kidney disease is targeted at all stages, but in the later stages kidney function is severely reduced, requiring more intensive intervention in preparation for Stage 5 (AIHW, 2011a). The five stages of CKD are outlined in Table 2.

**Table 2: The Five Stages of CKD (AIHW, 2011a).**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>eGFR</th>
<th>Kidney Function Deterioration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kidney damage (protein in urine) and normal GFR</td>
<td>More than 90</td>
<td>50% - 60%</td>
</tr>
<tr>
<td>2</td>
<td>Kidney damage and mild decrease in GFR</td>
<td>60 – 88</td>
<td>60% - 70%</td>
</tr>
<tr>
<td>3</td>
<td>Moderate decrease in GFR</td>
<td>30 – 59</td>
<td>70% - 77.5%</td>
</tr>
<tr>
<td>4</td>
<td>Severe decrease in GFR</td>
<td>15 – 29</td>
<td>77.5% - 85%</td>
</tr>
<tr>
<td>5</td>
<td>Kidney failure, including ESKD (dialysis or kidney transplant needed)</td>
<td>Less than 15</td>
<td>85% and above</td>
</tr>
</tbody>
</table>
Since the mid-1980s, Indigenous Australians have had a higher incidence of ESKD receiving RRT than non-Indigenous Australians (ANZDATA, 2018; Lawton et al., 2015). ESKD was the underlying or associated cause of death for 15.8% of Indigenous deaths between 2008 and 2012 (AIHW, 2015), contributing 5% of the total disparity between Indigenous and non-Indigenous mortality (AIHW, 2014). The current incidence rates of ESKD for Indigenous patients are markedly and persistently higher than those for non-Indigenous patients, as shown in Figure 1.

*Figure 1: Unadjusted incident RRT rate – Australia (ANZDATA, 2018).*

Indigenous patients receiving RRT are generally much younger and live in more remote areas than non-Indigenous patients. The discrepancy in ESKD incidence is most prominent among Indigenous adults aged 25 to 64 where rates are up to 15 times higher than in the non-Indigenous population, as shown in Figure 2 (ANZDATA, 2018), and a 20-fold higher rate of ESKD has been found among Indigenous Australians living in remote compared with urban areas (Cass, Cunningham, Wang, & Hoy, 2001). This reinforces the importance of transplantation as a treatment option for Indigenous patients, who would otherwise be required to undergo dialysis for several years or even decades.

*Figure 2: Relative incidence rate of treated ESKD for Indigenous patients by gender Australia 2013-2017 (ANZDATA, 2018).*
Kidney transplantation is the optimal treatment for ESKD, but there is a significant and persistent disparity in transplants to Indigenous and non-Indigenous Australians, a situation that is similar to Indigenous patients in New Zealand, Canada and the United States (Yeates et al., 2009). In 2017, there were 2,161 Indigenous Australians registered for RRT. Of these, 87% were reliant on dialysis and 13% had received a kidney transplant (ANZDATA, 2018). In comparison, 49% of non-Indigenous Australians with ESKD were reliant on dialysis and 51% had received a kidney transplant (ANZDATA, 2018), as outlined in Figure 3.

*Figure 3: Prevalent Patients by Ethnicity and Treatment Modality 2017 (ANZDATA, 2018). (HD=haemodialysis, PD=peritoneal dialysis).*

Organ donation
Over the last ten years the number of Indigenous organ and tissue donors across Australia has steadily increased – primarily due to improved community awareness, and because conversations about organ and tissue donation with Indigenous people are now being conducted in a culturally appropriate manner by expert trained health professionals. In 2008, 1.5% (4/259) of donors were Indigenous, which increased to 3.2% (18/554 donors) in 2018. Culturally appropriate educational materials using pictures, stories and language have been developed with Indigenous people to aid discussions about donation. Previous work undertaken in the Northern Territory identified no cultural barriers that preclude organ donation from being discussed (Stephens, 2007). However, a number of factors continue to impact on the potential for donation from Indigenous people, including:

- Pre-existing comorbidities such as diabetes, hypertension and alcohol misuse, often at a young age, which precludes some Indigenous patients from being considered medically suitable for donation, particularly when coupled with the distance from the potential receiving transplant units.
- A consent rate for donation of approximately 30-40%, which is around half the national rate.
- Indigenous people not being aware of and understanding the link between organ donation and transplantation and how donation may benefit someone in their community.
- Challenges of conducting donation conversations with large Indigenous families split between the community and the hospital often many kilometres away, and the difficulties that sometimes arise in identifying the senior next of kin/community spokesperson.
• Heterogeneity between the different Indigenous communities in terms of health literacy, awareness and the likelihood of giving consent to donation – urban Indigenous people are more likely to give consent to donation than Indigenous people from remote communities.

• Cultural beliefs that preclude organ donation, such as belief in the importance of being buried whole and in the transference of the spirit of the donor with their donated organ to the recipient.

• The time frame over which donation occurs which may be unacceptable for some Indigenous (and non-Indigenous) families, particularly those from remote communities.

• Mistrust of the health system.

There has been considerable debate about the merits of an ‘opt-out’ approach to organ and tissue donation in Australia, but this concept would likely be difficult to explain to Indigenous people, many of whom have low health literacy. Consequently, the main priorities should be:

1) Systematically reviewing the evidence on the outcomes of kidney transplantation using a live donor in the Indigenous patient population to inform health service protocols; and

2) Educating Indigenous communities about the value of organ donation and how it links to transplantation, ideally in partnership with local transplant recipients and donor families.

Pre- and post-transplant barriers
In addition to donation issues, numerous pre- and post-transplant barriers that may impede Indigenous Australians’ access to a kidney transplant have been identified. Pre-transplant barriers commonly comprise sociocultural and geographic factors, such as a cultural and/or communication divide between the patient and the practitioner, and logistical difficulties in accessing regular assessment and workup tests that are only available in metropolitan areas. Additionally, Indigenous ESKD patients are far more likely to be smokers, diabetic, overweight or obese, and to suffer from cerebrovascular, coronary artery and peripheral vascular disease (Barraclough, Grace, Lawton, & McDonald, 2016; McDonald, 2004; Rogers, Lawton, & Jose, 2006). High comorbidity profiles result in a significant proportion of Indigenous ESKD patients being deemed unsuitable for transplantation.

The poorer post-transplant outcomes experienced by Indigenous patients also presents a significant barrier to transplantation. Indigenous patients are more likely to experience greater sensitisation and human leukocyte antigen (HLA) mismatches, acute rejection, bolus doses of steroids, monoclonal antibody treatment for rejection, hospitalisation with a longer length of stay, and post-transplant infection, particularly bacterial and fungal infections (Boan, Swaminathan, & Irish, 2017; Rogers et al., 2006). The 2017 ANZDATA Annual Report identified a difference in survival after kidney transplantation from a deceased donor between non-Indigenous and Indigenous recipients, evident from 1.5 years post-transplantation. At 5 years post-transplant, 84% of Indigenous recipients and 91% of non-Indigenous recipients were alive, and transplant kidney function was maintained in 71% of Indigenous recipients compared with 83% of non-Indigenous persons (ANZDATA, 2018).

At the end of 2017, 964 patients were active on the Australian kidney transplant waiting list, 31 of whom were Indigenous (ANZDATA, 2018). However, the number of deceased donor kidneys available for transplantation is far lower than the number of patients who might benefit from a transplant, and the average time spent on the waitlist before receiving a transplant is 3 years (KHA, 2019). Prior to 2018, national protocols in Australia required that patients have an anticipated 80% likelihood of survival at 5 years post-transplantation to be eligible for the kidney transplant waitlist (TSANZ, 2018).
This is no longer an absolute requirement, and eligibility for deceased donor kidney transplant waitlisting now requires that kidney transplant candidates have a high likelihood of significant benefit from receiving a kidney transplant (TSANZ, 2018). However, the substantial pre- and post-transplant challenges experienced by Indigenous ESKD patients ultimately means that they have a poorer prospect of successful transplantation compared to non-Indigenous patients, and are thus less likely to be listed for a kidney transplant.

**Aims of this report**
This report has three interrelated aims, comprising:

1) Summarising the literature on Indigenous kidney transplant candidates’ barriers to: a) being waitlisted for transplant, b) receiving a transplant, and c) maintaining transplant function.

2) Identifying data and knowledge gaps that prevent the attainment of a comprehensive understanding of pre- and post-transplant barriers.

3) Proposing a series of recommendations for research, practice and policy to either:
   a) address data and knowledge gaps, or
   b) draw upon current knowledge to inform pre- and post-transplant initiatives that are tailored for the Indigenous patient cohort.

It is anticipated that the report will serve as a precursor to a series of projects and health service initiatives that target identified transplantation barriers, practice issues and evidence gaps. The report’s findings will also be presented to an international audience at the World Congress of Nephrology Satellite Symposium, “First Nation Kidney Health – a focus on transplantation”, in April 2019, which will facilitate an international exchange of ideas on First Nation transplant issues. It is planned that a workshop will be held in the second half of 2019 to engage the local health care sector in Indigenous kidney health issues and enable a diverse range of voices to be heard.

To ensure the momentum generated by this report is not lost, it is proposed that the TSANZ, in partnership with the Australian and New Zealand Society of Nephrology (ANZSN) and Organ and Tissue Authority (OTA), establish a Taskforce to provide oversight and input into Indigenous kidney transplantation issues, consult the Indigenous and health care communities on the report’s recommendations, and drive action across research, practice and policy domains.

**Structure of this report**
The remainder of this report is structured as follows:

- **Chapter 2** describes the work that has been undertaken to date in the consumer engagement space, existing literature on pre- and post-transplant barriers for Indigenous patients, and overarching data issues.

- **Chapter 3** outlines pre-transplant knowledge and data gaps, as well as next steps and recommendations for research, practice and policy.

- **Chapter 4** outlines post-transplant knowledge and data gaps, as well as next steps and recommendations for research, practice and policy.

- **Chapter 5** presents a summary of the report.
Current Evidence

Consumer Engagement

Historically, much of the focus on the performance of the health care system has been from the perspective of the providers and funders. More recently, the active involvement of consumers and community has become central to both health care service provision and research (ACSQHC, 2017). Over the past decade extensive consumer engagement research has been undertaken within the Indigenous ESKD patient population, and much is now known about the experiences of Indigenous dialysis patients, particularly perceptions of key barriers to treatment and support (Devitt et al., 2008; Dwyer et al., 2011; Hughes, Dembski et al., 2018; Hughes, Kelly, Mick-Ramsamy, & Mills, 2018; Kelly et al., 2015; KHA, 2018; Kirkham et al., 2018; Togni et al., 2017). A clear and consistent message from these research activities has been a high degree of interest in kidney transplantation among Indigenous dialysis patients and their families.

This chapter outlines seven consumer engagement projects that focus on the subjective experiences of Indigenous ESKD patients, their families and communities. While these projects utilise disparate methodologies and explore different issues and themes, they all share one commonality: the experiences and insights of the consumer (i.e. patients, families and carers) are prioritised and harnessed to guide the direction of the research and subsequent recommendations for policy and practice.

Catching Some Air – Asserting Indigenous Information Rights in Renal Disease

The Catching Some Air project, led by the Menzies School of Health Research, is due to be completed in May 2019. This project’s primary focus is consulting with the Indigenous CKD/ESKD community to obtain guidance on:

1) The development of an Indigenous data governance framework and implementation processes within the ANZDATA Registry; and

2) How to create effective, safe, culturally appropriate health systems for patients and communities most impacted by kidney disease. These recommendations will feed into the Kidney Health Australia – Caring for Australasians with Renal Impairment (KHA-CARI) Guideline for Management of CKD in Aboriginal and Torres Strait Islander and Maori peoples (Duff, Jesudason, Howell, & Hughes, 2018; Hughes, Kelly, Mick-Ramsamy, & Mills, 2018).

Consultation meetings in three main sites, Darwin, Alice Springs and Thursday Island, comprise the main method of gathering evidence to inform the aforementioned initiatives (Hughes, Kelly, et al., 2018). A number of secondary consultation sites will also be used to test the consolidated recommendations provided by the three main sites (Hughes, Kelly, et al., 2018).

### Box 2: Catching Some Air transplant-related recommendations

- Community-based education is important, not only to prevent ESKD, but to learn about the available treatment options, including the transplantation pathway.
- Transplant care guidelines need to adopt a holistic approach that reflects Indigenous patients, families and communities’ world view.
- Indigenous ESKD patients should be supported to receive post-transplant care and treatment in their community, in a way that supports them to ‘live with culture’.
Kidney Health Australia’s Indigenous Community Consultations
Complementing the Catching Some Air project in the Northern Territory, Kidney Health Australia (KHA) is currently conducting a series of community consultations in 16-18 non-Northern Territory Indigenous communities around Australia to further inform the development of the KHA-CARI Guideline for Management of CKD in Aboriginal and Torres Strait Islander peoples. These community consultations, also referred to as ‘yarning circles’, are part of a 2-year federally-funded program, supported by the office of the Indigenous Health Minister, the Hon Ken Wyatt MP. The consultations have two specific aims:

- To seek feedback and advice on the focus and content of the proposed KHA-CARI clinical guideline for the Management of CKD among Aboriginal and Torres Strait Islander Peoples; and
- To seek feedback and advice on the opportunities for translation of the new clinical guideline into culturally-safe consumer information, tools and education materials (KHA, 2018).

The methodology for this project is outlined in Duff et al. (2018), and is underpinned by local Indigenous governance and clear pathways for feedback to community. Local Aboriginal and Torres Strait Islander Reference Groups will be identified and established in the selected urban and regional communities (KHA, 2018a). The Reference Groups’ role will be to provide input on the questions and format of the consultation in each site, inform Elders and other relevant community members about the consultation and invite them to be involved, and provide feedback on draft consultation reports which will be developed for each site based on specific needs at that site (KHA, 2018a). Consultations will be co-convened by a lead clinical contact or researcher in partnership with a local Indigenous community contact (KHA, 2018a). Consultations will include discussions around the scope, content and implementation of the KHA-CARI CKD management guidelines, in addition to general discussions about renal care including transplantation.

Indigenous Patient Voices Symposium
Experts in kidney health, including Indigenous people living with kidney disease (i.e. patients with CKD, ESKD, kidney transplants and carers), clinicians from primary, secondary and tertiary care, researchers and policy leaders, gathered in Darwin on 6 September 2017 for the inaugural Indigenous Patient Voices Symposium. This was linked with the 53rd Annual Scientific Meeting of the Australia and New Zealand Society of Nephrology (Hughes, Dembski, et al., 2018). Patients and carers described key historical events and milestones that shaped the way they lived their lives, and discussed the specific challenges they faced in accessing appropriate information and education, primary care and specialist services (Hughes, Dembski, et al., 2018). Patients’ lived experiences were then used to inform an action plan, performance indicators for renal care, and a series of recommendations for state and federal governments to consider and address as part of future policy initiatives (Hughes, Dembski, et al., 2018).
Indigenous knowledge in health services: a consumer partnership framework

In 2018, the Menzies School of Health Research published the findings from a qualitative research framework that enabled Indigenous renal patients’ expectations and satisfaction of care in the Northern Territory to guide recommendations for health care policy and planning. The Indigenous reference group (IRG) was comprised of six Darwin-based haemodialysis patients, who met on a bimonthly basis between April and November 2017 (Kirkham et al., 2018). The key takeaway message from the IRG was that ESKD patients desire opportunities to positively influence dialysis and transplant care policies, and the consumer partnership framework employed by this study provided an appropriate model through which to do so (Kirkham et al., 2018).

The IRG’s discussions and recommendations led to the adoption of several new initiatives, including the ‘Kidney Yarning Circle-Pathways to My Home’ education program. This program provides Indigenous patients and families with more appropriate information and orientation to services, including education about the transplantation journey (Kirkham et al., 2018). Both IRG members and project investigators recommended that a similar consumer partnership framework be embedded into the Top End Health Service’s operational structures (Kirkham et al., 2018).

Patient-led Participatory Action Research (PAR) Project

The patient-led PAR project, run by the Menzies School of Health Research between July 2016 and May 2017, involved the development of patient-led cultural awareness training for renal nurses and was catalysed by the Central Australian Renal Voice (CARV) consumer group. Members from the CARV consumer group expressed an interest in teaching renal nurses about Indigenous culture and in building better relationships between Indigenous people on dialysis and the nurses who deliver their care.

Box 3: Indigenous Patient Voices Symposium – key issues raised by consumers

- The tyranny of distance presents significant social, financial and logistical burdens.
  - Dialysis and transplant services need to be available close to home so that patients can stay connected to community and country, and subsequently maintain psychosocial wellbeing, whilst undergoing assessment and treatment.
  - Patients reported issues in accessing suitable accommodation services when required to relocate from their community for treatment services, such as assessment for transplantation.
  - In many cases, patients’ employment was jeopardised by the travel demands associated with their treatment regimen. As a result, many patients were unemployed and subjected to Centrelink’s punitive reporting framework.
- The health workforce’s level of cultural awareness and respect for cultural matters.
  - The way in which health care professionals communicate with Indigenous patients was recalled with hurt and distress by some expert-patient delegates.
- Inequalities associated with the Australian health care system’s centralised care model.
  - Patients who cannot dialyse in their home communities reported feeling that they were forced to choose between their physical health and maintaining psychosocial wellbeing by remaining on country.
  - The lack of information and education services around access to deceased and living donor transplant in regional and remote communities impedes Indigenous patients’ likelihood of being waitlisted for or receiving a transplant.

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care (Togni et al., 2017). Nurses were recruited from each of the Alice Springs renal units and Purple House (WDNWPT), and participated in a series of workshops that provided information on language, living on country, bush foods and medicines, hunting, cultural and family obligations, and how to make Indigenous people feel comfortable in dialysis units (Togni et al., 2017). Nurses who participated in the project reported that the workshops strengthened their relationships with co-researchers and patients and influenced their practice, thus improving the delivery of culturally sensitive and patient-centred care to Indigenous dialysis patients (Togni et al., 2017).

**IMPAKT**

The IMPAKT project, coordinated by the Menzies School of Health Research between 2004 and 2008, investigated the disparity in access to kidney transplants between Indigenous and non-Indigenous Australians. The team of IMPAKT researchers visited and worked in 26 locations across South Australia, New South Wales, Queensland, Western Australia and the Northern Territory, including urban centres, regional towns and remote communities (Devitt et al., 2008). The project involved an in-depth exploration of patients’ and health care providers’ perceptions and attitudes toward transplant services, and specifically focussed on the following key objectives:

1) To assess the impact of medical and socio-demographic variables, especially Indigenous status, on the likelihood of being deemed medically suitable for renal transplant;
2) To evaluate the appropriateness, accessibility and effectiveness of patient education programs about renal transplant for Indigenous patients;
3) To identify systemic barriers to completing the essential steps towards transplant;
4) To examine the effect of current deceased-organ allocation algorithms upon Indigenous patients’ access to transplant, and to model alternative allocations; and
5) To collaborate with health service providers to investigate current practices and to improve the efficiency and equity of transplant services (Devitt et al., 2008).

<table>
<thead>
<tr>
<th>Box 4: Core themes identified by IMPAKT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Indigenous patients’ interest in transplant:</td>
</tr>
<tr>
<td>o Indigenous patients are interested in transplant but unclear about the process. They also wish to be better informed about their treatment plans.</td>
</tr>
<tr>
<td>o Patient education is not culturally tailored for Indigenous people.</td>
</tr>
<tr>
<td>• Clinical uncertainties:</td>
</tr>
<tr>
<td>o Many key transplant decision-makers are uncertain about the benefits of transplant for Indigenous patients.</td>
</tr>
<tr>
<td>o There is a widespread perception among health service providers that Indigenous patients are less likely to adhere to treatment requirements.</td>
</tr>
<tr>
<td>• Systemic issues:</td>
</tr>
<tr>
<td>o Communication issues profoundly affect patient/provider interactions at all levels in ways that disadvantage Indigenous patients.</td>
</tr>
<tr>
<td>o Under-resourcing and systems deficits, especially in regional areas, reduce capacity to address the needs of Indigenous patients.</td>
</tr>
<tr>
<td>o Distance and remoteness have a profound impact on patient care (&quot;IMPAKT &quot;, 2013).</td>
</tr>
</tbody>
</table>

The IMPAKT study team has published a number of peer-reviewed publications that speak not only to transplantation access, but more general experiences of accessing and utilising treatment for ESKD,
providing key insights from patients regarding how services might be delivered to meet their needs (Anderson, Cunningham, Devitt, & Cass, 2013; Anderson, Cunningham, Devitt, Preece, & Cass, 2012; Anderson, Devitt, Cunningham, Preece, & Cass, 2008; Devitt et al., 2017).

Managing Two Worlds Together
While the Managing Two Worlds Together project, led by Flinders University between 2008 and 2015, did not exclusively focus on kidney disease, it did explore a range of issues relevant to Indigenous ESKD patients. The overarching goal of the project was to improve knowledge of what works well and what needs improvement in the broader health care system for Indigenous patients from rural and remote areas of South Australia and parts of the Northern Territory (Dwyer et al., 2011). To achieve this, the researchers explored patients’ journeys and staff experiences, which unearthed five factors that inhibit Indigenous patients' access to health services (outlined in Table 3). While many Australians are likely to identify with one or two of these factors, Indigenous patients commonly experience all five concurrently, and interactions between these factors further exacerbates the complexity of navigating the Australian health care system (Dwyer et al., 2011).

Table 3: Five factors that affect access and quality of care (Kelly et al., 2015).

<table>
<thead>
<tr>
<th>Issue</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural and remote/city</td>
<td>Some of the problems facing country Indigenous patients and their health care providers are common to all country patients.</td>
</tr>
<tr>
<td>Impact of illness or injury</td>
<td>People with chronic or complex conditions are affected more by systemic health care problems, especially across hospital/non-hospital sectors, although any patient may experience care problems.</td>
</tr>
<tr>
<td>Language and communication</td>
<td>Some communication challenges that patients and staff encounter are common to all population groups for whom English is not a first language.</td>
</tr>
<tr>
<td>Financial resources</td>
<td>It is harder for all people who have little or no extra money to meet the costs of transport, treatment, being admitted for health care, and time off work or away from home and family.</td>
</tr>
<tr>
<td>Cultural safety</td>
<td>There are ways in which Indigenous people experience unique disadvantage in their interactions with the mainstream health system (and other social systems); and mainstream worldviews and beliefs about health and health care are often different from those held by Indigenous people.</td>
</tr>
</tbody>
</table>

Where to next?

Box 5: Summary of Recommendations

1. Undertake consumer engagement projects that specifically explore Indigenous transplant candidates’ and recipients’ preferred models of care.
2. Deliver consumer engagement training to renal unit and transplant centre staff.
3. Establish an Indigenous reference group in every transplant unit to help design pathways and models of care that are culturally appropriate.

Capturing patients’ lived experiences, and using these stories to drive meaningful health care reform, is arguably one of the most effective ways in which to address health care inequalities. Consumer engagement frameworks have proven to be a practical and effective methodology in health and medical research, but few health care services have drawn upon these frameworks to improve models of care in practice. For example, recent interviews with renal units revealed that no units had formally established an Indigenous consumer reference group to inform the care of Indigenous kidney
transplant candidates and recipients. Future consumer engagement projects should specifically explore the journeys and experiences of Indigenous transplant candidates and recipients and be designed to achieve effective research translation, informing patient-centred interventions.

Much of the work that has been undertaken in the ESKD consumer engagement space to date has explored how we can achieve better health outcomes for Indigenous Australians. This has generated a number of clear messages that cut across both pre- and post-transplant domains, all of which are addressed in latter chapters of this report, including:

- **Health services and practitioners must improve the accessibility, appropriateness and quality of information** about the causes, prevention, management, progression and treatment of kidney disease. Such information must take into account regional differences in culture, language, patterns of kidney health and illness, and service provision.

- **The renal health workforce must be trained and supported to deliver culturally appropriate and patient-centred care** for Indigenous patients. This includes identifying new employment pathways for Indigenous Australians to support the needs of people with ESKD including personal care attendants for people needing dialysis, health service navigator roles, health promotion and renal-equipped primary health care staff, nursing and nephrologist positions.

- **More renal care services need to be delivered in regional and remote communities** to address accessibility issues, and stronger transport networks and infrastructure should be established so that the Indigenous renal patient community can travel safely between metropolitan treatment services and their home community safely, without exorbitant costs.

- **Dialysis and transplant models of care need to be tailored** to cater for the unique needs of Indigenous patients, such as having separate spaces for men’s care and women’s care, and recognising the importance of family support.

While these issues have been known for some time, in many cases over several decades, practical responses from health care services and governments in the transplantation context have been few and far between. From a health service policy perspective, it is recommended that every Australian transplant unit managing Indigenous transplant patients explicitly convene an Indigenous reference group to allow Indigenous consumers to drive health care enhancements and improve patient-centred outcomes for Indigenous kidney transplant candidates and recipients. This is consistent with the National Safety and Quality Health Service Standards User Guide for Aboriginal and Torres Strait Islander Health, Action 2.13, which outlines the importance of health service organisations building effective and ongoing relationships with Indigenous communities, organisations and groups to identify service gaps, understand cultural beliefs and practices, and involve Indigenous people in determining their own health priorities (ACSQHC, 2017). In order to maximise the value of Indigenous reference groups, renal care providers need to be trained in consumer engagement practices to enable them to establish effective partnerships with Indigenous consumers and groups and drive the implementation of preferred models of care.

**Pre-Transplant Journey**

Indigenous Australians are less likely to receive a kidney transplant than other Australians, primarily because they are less likely to be waitlisted (Khanal, Lawton, Cass, & McDonald, 2018). At the end of 2015, only 1.9% of all Indigenous dialysis patients were waitlisted, compared to 9.5% of non-Indigenous patients (Lawton, McDonald, Snelling, Hughes, & Cass, 2017), which is similar to rates in the United States, Canada and New Zealand (Yeates et al., 2009).
Placement on the transplant waiting list is the culmination of a series of steps and assessments, including information sharing and patient education, addressing underlying health issues and referral for consideration for transplantation, as outlined in Figure 4. If not managed appropriately, these steps can quickly become barriers to waitlisting, particularly for rural and remote Indigenous patients (Khanal et al., 2018). Waitlisting cannot occur until the transplant assessment is successfully completed, with the patient being deemed medically suitable for a kidney transplant.

**Figure 4:** Steps to receiving a kidney transplantation.

Indigenous patients face multiple challenges in successfully completing work-up, and practitioners have acknowledged that patients are required to navigate a system that has been described as “fragmented, confusing, isolating and burdensome” (Devitt et al., 2017).

Information sharing and understanding the transplantation process

Qualitative research has repeatedly documented concerns about poor communication between Indigenous ESKD patients and non-Indigenous health professionals (Anderson et al., 2008; Cass et al., 2002; Hughes, Dembiski, et al., 2017; Rix, Barclay, Stirling, Tong, & Wilson, 2015). Poorer outcomes for Indigenous patients, including confusion and frustration (Anderson et al., 2008; Cass et al., 2002), discharge against medical advice (Einsiedel et al., 2013) and distrust of health care providers (Swain & Barclay, 2013; Tonelli et al., 2005) have been attributed to culturally inappropriate and ineffective communication practices. Indigenous patients’ lower levels of understanding of both their illness and its treatments have been linked to reduced active engagement in critical decision-making junctures and long-term management of their condition (Devitt & McMasters, 1998). The engagement of interpreters to assist Indigenous patients in health care settings has also been identified as grossly underutilised (Amery, 2017), primarily due to structural and process barriers (Ralph et al., 2017). These barriers comprise: limited interpreter availability, complexity in booking interpreters, health care provider time constraints, inadequate delivery of tools and training in cultural competence and working with interpreters, low knowledge and documentation of which language patients speak, and preferential use of unofficial interpreters (i.e. family members) for convenience (Ralph et al., 2017).

In a large and diverse cohort study of Indigenous dialysis patients, Devitt et al. (2017) found that the vast majority expressed a positive, in some cases intense, interest in receiving a kidney transplant. While many patients viewed it as their only hope of re-establishing a normal life in their homeland with their family, only half of the respondents reported feeling sufficiently informed about their transplant status and prospects (Devitt et al., 2017). Devitt et al. (2017) also noted that most patients only had a rudimentary knowledge of transplantation and an extremely limited understanding of eligibility criteria, the pathway to being listed and the risks/benefits associated with transplantation. Of the 146 Indigenous patients interviewed, one in four were either mistaken or uncertain about their current listing status (Devitt et al., 2017). These issues have been reinforced by repeated anecdotes from staff and patients in dialysis units who have reported that education and discussions about
transplantation are commonly misinterpreted by Indigenous patients as automatic acceptance and placement on the waitlist.

The multiple communication barriers faced by Indigenous patients not only undermines their engagement in treatment decision-making, but also promotes a sense of disempowerment at the individual, family and community level (Devitt et al., 2017; Sypek et al., 2018).

*Culturally appropriate communication and education resources*

Research has noted several common difficulties experienced by the predominantly non-Indigenous health workforce in effectively communicating with Indigenous people and providing appropriate advice. In many cases, these difficulties drive a misperception that Indigenous patients have limited capacity to understand and adhere to strict medical regimes (Anderson, Devitt, et al., 2012; Cass et al., 2002). Factors contributing to poor communication between health professionals and Indigenous patients include: multiple linguistic, social and cultural communication barriers; perceptions of systematic exclusion from critical knowledge (Lowell et al., 2012); a lack of culturally appropriate, user-friendly information and patient education strategies; and failing to assess and cater for patients’ level of health literacy (Devitt et al., 2017). Health literacy competencies apply to both the seeker and provider of information, and there is a growing emphasis on the need for renal care providers to rigorously assess Indigenous patients’ health literacy and tailor communication accordingly.

Indigenous patients and their families have also repeatedly raised concerns about the quality of transplant education resources. Indigenous patients’ feedback suggests that: current transplant information formats are poor facilitators of emotional engagement; the volume of information is often overwhelming; not all of it is relevant to the individual; and it is commonly complicated with the use of medical jargon, requiring practitioners’ assistance to decode the message (Cass, Cunningham, Snelling, Wang, & Hoy, 2003; Dole, 2013; Hayes, 2008; Liaw et al., 2011; Yeates et al., 2009). Despite these concerns, most transplant education resources continue to focus on the non-Indigenous population, and the small percentage that have been tailored for the Indigenous patient cohort are primarily developed by clinical nursing staff, who have limited capacity to address the resource gap. Importantly, few Australian transplant resources or education programs to date have been developed with Indigenous consumer input or independently evaluated.

An evaluation of a transplant education program in the United States tailored to meet the unique cultural and linguistic needs of Hispanic patients found that it empowered both patients and their families by addressing specific cultural concerns and improving attitudes about kidney transplantation, thus facilitating increased access to the transplant waiting list (Gordon et al., 2014). While no comparable program has been trialled for the Indigenous Australian population, the need for culturally competent pre-transplant education programs is indisputable and has been identified by both patients and health professionals in numerous studies (Anderson et al., 2008; Cass et al., 2002; Lambert, Mullan, Mansfield, & Lonergan, 2015).

*Different spiritual beliefs and decision-making processes*

For many Indigenous people, the kidney holds special importance in relation to spiritual and physical wellbeing. A sick kidney represents more than physical ill health in some cultures, and accepting a kidney from another person has ramifications beyond the release from maintenance dialysis. As a result, some Indigenous people may distrust transplantation and disregard it as a viable treatment option for themselves or family members (Anderson, Yeates, Cunningham, Devitt, & Cass, 2009).
While there is some literature and anecdotal evidence to suggest this is primarily a view held by older family members with a lesser impact on younger generations, the relationship, influence and authority of elder family members in the decision-making process must be fully appreciated by practitioners.

For many Indigenous communities, important decisions are not made by the individual in isolation, and consultation with extended family over a period of several months or longer are considered essential. This is a process that must run its course, but the significant delays it causes in completing informed consent, transplant assessment and work-up supports the case for education and discussions on treatment options to commence early, ideally before dialysis is initiated.

Late referral to dialysis
Late referral (defined as being first seen by a nephrologist less than 3 months prior to starting dialysis) is now less prevalent among Indigenous patients than non-Indigenous patients, as shown in Table 4. These rates show that 83% of Indigenous ESKD patients are assessed by a nephrologist well in advance of commencing dialysis, providing an opportunity for early discussions about treatment pathways.

Table 4: Percentage of Late Referral by Ethnicity 2013-2017 (ANZDATA, 2018).

<table>
<thead>
<tr>
<th>Year</th>
<th>Non-Indigenous</th>
<th>Indigenous</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>19%</td>
<td>18%</td>
</tr>
<tr>
<td>2014</td>
<td>18%</td>
<td>15%</td>
</tr>
<tr>
<td>2015</td>
<td>18%</td>
<td>17%</td>
</tr>
<tr>
<td>2016</td>
<td>19%</td>
<td>14%</td>
</tr>
<tr>
<td>2017</td>
<td>18%</td>
<td>17%</td>
</tr>
</tbody>
</table>

Late referral manifests in poorer physical condition at commencement of treatment and negatively impacts ensuing treatment phases (Cass, Cunningham, Snelling, & Ayanian, 2003). The development of user-friendly, culturally-informed methods to educate Indigenous patients and their families is still needed to combat late referral and promote early transplant and organ donation decision making.

The role of patient navigator programs (PNPs)
In the past decade, there has been considerable interest in the role of patient navigators in addressing systematic problems in access to health care for Indigenous patients. The first PNP was established in New York in 1990 to address perceived barriers stemming from mistrust, fatalistic views and system complexity experienced by medically underserved, generally African American women, with breast cancer (H. P. Freeman, 2006). The objective of PNPs is to train lay individuals to provide one-on-one support during assessment, treatment and beyond for individuals who may have a limited understanding of Western health care systems (Whop et al., 2012). In recent years, PNPs have become more widely used, particularly in the Canadian Indigenous population, and have expanded to not only inform patients about treatment options and available services, but also to address cultural, educational and language barriers through community outreach (Whop et al., 2012).

While the efficacy of PNPs in the Indigenous kidney transplant candidate and recipient population remains unclear, feedback from consumer engagement activities suggests that this is a potentially valuable initiative worth evaluating in Australian renal units and transplant centres.
Completing transplant workup tests and formal assessment

Personal agency and competing priorities

Competing family priorities and cultural obligations, a personally resource intense treatment regime and multiple specialist and investigative appointments can lead to poor attendance at transplant workup and assessment appointments. This can manifest in further delays with regard to the completion of transplant assessment, workup and admittance to the waitlist. Practitioners may also associate poor attendance with non-adherence, which influences expectations of future behaviour, including how the patient would manage and respond to the demands of kidney transplantation, promoting unconscious bias and institutional racism (Majoni & Abeyaratne, 2013; Rix et al., 2015; Tonelli et al., 2005; Tonelli et al., 2004; Yeates et al., 2009).

Geographical barriers

While there is great diversity among the Indigenous Australian population, many Indigenous patients share social and environmental factors that are likely to affect how they respond to the demands of pre-transplant assessments (Anderson et al., 2013). One particularly prevalent factor is remoteness, with two-thirds of Australia’s Indigenous population living in rural and remote communities, often with populations between 50 and 3000 people (Anderson et al., 2013). The prevalence and burden of ESKD is significantly greater in remote compared to urban areas (ANZDATA, 2018; Cass et al., 2001), and the need to relocate to access treatment has a strong negative impact on individuals, families and entire communities (Preston-Thomas, Cass, & O’Rourke, 2007).

Geographical variation in transplant rates has been reported in North America, Canada, Europe and Australia (Yeates et al., 2009). Recent research has reaffirmed that Indigenous patients undergoing dialysis are substantially less likely than non-Indigenous patients to be placed on the transplant waitlist, as shown in Figure 5, with this disparity increasing with remoteness (Khanal et al., 2018).

Figure 5: Unadjusted Kaplan Meier (K-M) curve showing cumulative incidence of waitlisting (time to placement on the waitlist after initiation of RRT) by ethnicity (Khanal et al., 2018).

Requirement to travel long distances and coordinate multidisciplinary services

Access to health-related infrastructure in remote communities is generally poor, and in 2005-06 approximately half of Indigenous ESKD patients resided in areas with neither dialysis nor transplant facilities (Anderson et al., 2013). However, even when renal services are available within the local
community, certain basic investigative tests required for pre-transplant workup are commonly only performed in urban areas, including:

- Cardiac investigations (i.e. echocardiography, coronary angiogram and stress test)
- Radiology investigations (i.e. chest x-ray, abdominal/renal ultrasound, bone density studies)
- Dental examination
- Dermatology review
- Lung function
- Infective screening (i.e. MRSA, VRE)

Undertaking regular day or overnight trips to tertiary facilities hundreds of kilometres away, or even interstate, is time consuming and logistically challenging. In addition to travel related stressors, coordinating specialist appointments, transport operators, community clinics, accommodation providers and dialysis units requires extensive planning. Failure to secure all of the required bookings or capacity issues with any one operator can derail the process, making the completion of tests a lengthy and frustrating process for rural and remote patients. Additionally, in some instances Indigenous patients’ reluctance to leave their community to complete pre-transplant assessment and workup, or a need to return to community during the assessment process for family and cultural obligations, manifests in further delays and reduces their likelihood of achieving waitlisting status.

**Box 6: Case study of a waitlisting journey delayed due to family obligations**

A 62-year-old male patient from the Tiwi Islands commenced dialysis in May 2014. He received transplant education in July 2015, was assessed for transplantation in July 2016 and then referred for transplant workup in August 2016. Since then, his workup journey has comprised:

- In September 2016, dental outreach in the Tiwi Islands was undertaken.
- In May 2017, the patient travelled to Darwin for a week of workup, but left halfway through to attend a funeral back home.
- In October 2017, the patient returned to Darwin to complete cardiac testing but failed to attend a follow up dental appointment.
- In November 2017, the Royal Adelaide Hospital reviewed the patient for transplant waitlisting, but needed the patient to complete Mantoux, dental and HLA tests.
- In August 2018, the patient travelled to Darwin for further workup testing but developed chest pain and could not complete the scheduled appointments.
- In December 2018, the patient failed to attend cardiology and dental appointments in Darwin due to a funeral in the Tiwi Islands.
- As of January 2019, the patient is still yet to complete cardiology and dental consultations.

This case study highlights the difficulties faced by rural and remote patients in completing workup and achieving waitlisting. In many cases, these patients are required to put their lives on hold in order to complete testing in an urban centre that is hundreds or thousands of kilometres from their home community. Those who prioritise family and cultural obligations are likely to be negatively affected by workup delays, as most tests cannot be performed in the home community.

Patient assisted travel schemes (PATS) are managed by the states and territories, and all jurisdictions subsidise accommodation and private vehicle travel for eligible patients (NRHA, 2014). While eligibility varies between jurisdictions, PATS is typically available to patients travelling more than 100km one
way for specialist medical services. Fuel allowances are generally only intended to cover a portion of the cost of fuel on a cents per kilometre basis, and commercial accommodation subsidies are limited, ranging from $40 to $60 per person per night. Some schemes also provide support for ground and air transport, which is vital for jurisdictions such as the Northern Territory where distances to specialist services can be vast. Over the past decade, a number of PATS schemes have been reviewed at federal state and territory government levels. Recurring recommendations have centred around increasing subsidies for accommodation and travel; streamlining the process for claiming reimbursements; and expanding the schemes to capture a range of essential non-medical specialist services such as allied health and dentistry, which are particularly important for kidney transplant candidates (NRHA, 2014).

Multidisciplinary pre-transplant teams comprise a health care network devoted to identifying, preventing and managing the complications that arise in a patient’s journey to transplantation. A variety of medical and allied health staff, including nephrologists, nurses, dentists, pharmacists, social workers and Indigenous health workers, form part of pre-transplant teams, which work with and improve coordination between the primary and tertiary health care sectors. These teams also deliver accurate and culturally appropriate education, information and clinical care to kidney transplant candidates. Multidisciplinary outreach clinics should be made available to patients in rural and remote areas every 3 months, and an example of a patient’s appointment schedule is outlined in Table 5.

Table 5: Example of a patient’s schedule for a multidisciplinary pre-transplant clinic.

<table>
<thead>
<tr>
<th>Box 7: Primary objectives of multidisciplinary pre-transplant care</th>
</tr>
</thead>
<tbody>
<tr>
<td>• To evaluate and manage comorbid conditions (i.e. diabetes, hypertension, infections);</td>
</tr>
<tr>
<td>• To prevent and manage cardiovascular disease;</td>
</tr>
<tr>
<td>• To identify, prevent and manage ESKD specific complications (i.e. management of nutrition, anaemia, renal bone disease as well as fluid, electrolyte and acid-base problems); and</td>
</tr>
<tr>
<td>• To help patients and their families prepare for the demands of transplantation.</td>
</tr>
</tbody>
</table>
Access to transplant acceptance team delaying entry to waitlist

The majority of dialysis units caring for Indigenous patients in Australia are distant from the tertiary transplant service. While teleconferences may keep communication channels open, patient review and acceptance onto the waitlist is dependent on visits from the tertiary centre and transplant acceptance team and assessment by transplant physician and surgeon. The availability of these visits varies nationally; renal unit staff from Adelaide travel to Alice Springs, Darwin and Katherine to provide...

Box 8: Case study of a waitlisting journey delayed due to dermatological treatment

A 41-year-old female with presumed diabetic nephropathy commenced dialysis (Day 0) following rapid declining kidney function in the preceding 2 years. She had previously documented chronic tinea corporis (a dermatophyte infection of the skin), which was again microbiologically confirmed on Day 61. As shown in Figure 6, complete resolution of tinea corporis was eventually achieved on Day 396 following 294 days of targeted treatment. Throughout this journey, the patient never experienced a serious soft-tissue infection or bacteraemia, and was engaged in her renal care, including participating in numerous appointments (Hughes, Aye-Min, et al., 2017). In order to complete the assessments, the patient opted to relocate to the urban centre for chronic maintenance dialysis, as she recognised that she may not have completed the assessments and achieved waitlisting if she remained in her home community.

Figure 6: Timeline to activation to the transplant waitlist (Hughes, Aye-Min, et al., 2017).

The delayed cure of chronic and extensive tinea corporis was responsible for 59% of the time taken to achieve active kidney transplant waitlisting (294 days of 496 days). Timeliness to achieve complete resolution of the infection and subsequent waitlisting failed to meet the expectations of both the patient and clinicians. A combination of systemic and individual factors contributed to the delayed resolution, including: disjointed communication, lack of access to medication, normalisation of skin conditions in the Indigenous population, and the clients’ competing priorities (Hughes, Aye-Min, et al., 2017).
services, while patients in Queensland, Western Australia and New South Wales must travel to major metropolitan centres (i.e. Brisbane, Perth, Sydney or Newcastle) to access transplant assessment.

As part of this project, structured interviews were conducted with all transplant units throughout Australia. These interviews revealed that infrequent visits and logistics of coordinating patient attendance with transplant team visits can delay admission to the waitlist. As a result, geographical distance is an issue not only for those residing in remote and very remote areas (i.e. Kalgoorlie, Broome, Mt Isa, Alice Springs), but also applies to tertiary facilities with large catchment areas such as Cairns, Townsville, Darwin.

Staying healthy on the list
Once placed on the transplant waitlist, it is vital that the patient stay as healthy as possible to ensure they remain on the waitlist and are medically fit for the transplant operation to reduce the risk of complications in the recovery phase (KHA, 2019). The national clinical guidelines for organ transplantation indicate that in order to remain active on the waitlist, patients should undergo annual reassessment by the transplant unit to ensure they continue to fulfil the inclusion criteria (TSANZ, 2018). Common factors that may result in the removal of a patient from the active waitlist include cardiovascular disease, uncontrolled diabetes, worsening comorbid diseases, systemic or skin infections, inability to maintain recommended diet and fluid intake, weight gain/obesity and evidence of poor adherence to prescribed medications and treatments (TSANZ, 2018). Evidence suggests that the likelihood of transplantation during the first year of waitlisting is similar for Indigenous and non-Indigenous patients, but significantly lower for Indigenous patients in subsequent years, which may be linked to issues associated with the management of comorbidities and removal from the waiting list (Khanal et al., 2018).

It is well documented that the burden of comorbidities is significantly higher among Indigenous dialysis patients and kidney transplant candidates, particularly diabetes. Diabetes heightens the risk of post-transplant complications, including cardiovascular events and mortality, and past research has shown that the 5-year post-transplant survival rate for diabetic patients is significantly lower than for non-diabetics’ (70% vs 93%) (Cosio, Hickson, Griffin, Stegall, & Kudva, 2008). Indigenous patients’ comorbidity burden is further exacerbated by socio-economic factors such as access to accommodation, quality and quantity of food and appropriate clothing (particularly footwear) (Dole, 2013; Majoni & Abeyaratne, 2013; Tong et al., 2011). The longer patients remain on dialysis and the transplant waitlist, the greater the probability that these conditions will take their toll, reducing the chance of receiving a kidney transplant.

Fulfilling requirements to stay on the waitlist can be particularly challenging for rural and remote Indigenous patients. Following the initial transplant assessment, waitlisted patients are required to undertake annual reassessments (TSANZ, 2018). For rural and remote patients, this commonly necessitates extensive logistical planning given the number of assessments that need to be completed and the lack of essential services in close proximity. Difficulties associated with maintaining currency of tests means patients may find themselves in a constant cycle of examinations, rather than a single set of tests that roll around once a year.

Surgical assessment
Despite improved operative techniques and immunosuppressive regimens, surgical complications following a kidney transplant remain an important challenge that can increase morbidity,
hospitalisation and costs. Surgical complications occurring in the general population after a kidney transplant are well described, including surgical site infections (occurring in 4% - 7.5% of patients), wound healing disorders (occurring in around 20% of patients), urologic complications (occurring in 2.4% - 14% of patients) and arterial and venous thrombosis (occurring in less than 5% of patients), (Di Carlo & Darras, 2015; Katz et al., 2003; Pourmand et al., 2012). Very little is known about the prevalence and antecedents of these complications in the Indigenous patient population. However, anecdotal evidence suggests that Indigenous recipients are at greater risk of wound healing disorders and urologic complications due to higher rates of overweight and obesity and cultural rituals that involve the circumcision and subincision of the penis and urethra. Further research is needed to determine whether tailored pre-transplant surgical assessment and post-transplant monitoring and management protocols are required to reduce the occurrence of surgical complications and adverse outcomes in Indigenous transplant recipients.

One of the few studies to explore the burden and pattern of infection following renal transplantation in Indigenous (n = 57) compared to non-Indigenous (n = 84) patients found that there was a non-significant trend of more admission days because of infection in the first year in the Indigenous compared to non-Indigenous group, and pneumonia and cryptosporidium were more frequent causes of infectious admission in the Indigenous group, as outlined in Table 6 (Boan et al., 2017).

Table 6: Admission days in the first year post-transplant according to site of infection in Indigenous versus non-Indigenous kidney transplant recipients (Boan et al., 2017).

<table>
<thead>
<tr>
<th></th>
<th>Indigenous patient admission days (n = 568)</th>
<th>Non-Indigenous patient admission days (n = 458)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine</td>
<td>116 (20)</td>
<td>174 (38)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Bacteraemia</td>
<td>92 (16)</td>
<td>82 (18)</td>
<td>0.503</td>
</tr>
<tr>
<td>Wound</td>
<td>88 (15)</td>
<td>26 (6)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Invasive Fungal Infection</td>
<td>58 (10)</td>
<td>46 (10)</td>
<td>1.000</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>56 (10)</td>
<td>10 (2)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Skin and Soft Tissue Infection</td>
<td>11 (2)</td>
<td>18 (4)</td>
<td>0.060</td>
</tr>
<tr>
<td>Cryptosporidium</td>
<td>90 (16)</td>
<td>0 (0)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Other</td>
<td>57 (10)</td>
<td>102 (22)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

An ANZDATA analysis of first deceased donor recipients in Australia from 2001 – 2017 found that the rate of technical graft loss within 30 days post-transplant is low for both non-Indigenous and Indigenous kidney transplant recipients (1.4% and 1.6% respectively). An expansive definition of technical graft loss was used, comprising renal artery stenosis and thrombosis, renal vein thrombosis, haemorrhage (primary and secondary), embolus (thrombo and cholesterol), non-viable kidney (due to pre-transplant cortical necrosis), cortical necrosis (not due to rejection), and ureteric and bladder problems. No clear relationship between technical graft loss and BMI was identified, which may reflect current waitlisting practices that prevent people with ‘unsafe’ BMI ranges from being listed for a kidney transplant. However, Indigenous recipients were significantly more likely to be in the upper BMI ranges compared to non-Indigenous recipients; 20.5% of Indigenous patients had a BMI greater than 30 compared to 16.9% of non-Indigenous patients, and 13.8% of Indigenous patients had a BMI greater than 35 compared to 8.4% of non-Indigenous patients.
Multiple risk factors for surgical complications have been identified in kidney transplant recipients, including: obesity, diabetes, cardiovascular disease, acute cellular rejection, delayed graft function, and prolonged cold ischemia time (Harris et al., 2015). Obesity serves as both a direct and indirect risk factor for adverse short- and long-term effects, as outlined in Table 7. Given these associated technical difficulties, surgical site complications and outcome-related concerns, many transplant programs impose a maximum BMI eligibility threshold for kidney transplant candidates, though this is not formally recommended in the national eligibility guidelines (TSANZ, 2018).

**Table 7: Direct and indirect effects of obesity (Gill, 2008).**

<table>
<thead>
<tr>
<th>Short-term direct effects</th>
<th>Long-term direct effects</th>
<th>Long-term indirect effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wound complications: delayed healing, infection &amp; sepsis</td>
<td>Increased risk of rejection</td>
<td>Diabetes</td>
</tr>
<tr>
<td>Lymphocele</td>
<td>Increased risk of graft loss</td>
<td>Vascular disease</td>
</tr>
<tr>
<td>Hematoma</td>
<td></td>
<td>Cardiovascular disease</td>
</tr>
<tr>
<td>Prolonged cold ischemia time &amp; delayed graft function</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased risk of hospital readmission</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The relationship between body composition and body weight has been found to differ significantly between Indigenous and non-Indigenous Australians, suggesting that the currently recommended classification of weight status, based on BMI, may be inappropriate for use in the Indigenous patient population (Maple-Brown et al., 2015; Piers, Rowley, Soares, & O’Dea, 2003). While other measures (i.e. waist circumference, waist hip-ratio and bioelectrical impedance analysis) are not currently collected on a national basis, surgeons typically do not rely on these measures to assess whether patients’ obesity poses an unacceptable technical challenge for surgery, opting instead for a thorough clinical examination to determine suitability.

**Prevalence of surgical risk factors in Indigenous kidney transplant recipients**

An observational cohort study of all adult patients registered with ANZDATA who commenced RRT in Australia between 28 June 2006 and 31 December 2016 found that 61.3% of Indigenous patients had comorbid conditions compared to 35.6% of non-Indigenous patients (Khanal et al., 2018). Surgical risk factor discrepancies are also evident among the kidney transplant recipient cohort, with Indigenous recipients more likely to have a higher BMI, be classified as smokers and experience comorbidities such as diabetes and coronary artery disease. They also experience longer total ischaemic time and greater delayed graft function, as outlined in Table 8.
Table 8: Cohort description of primary deceased donor kidney transplants performed in Australia between 2001 and 2016, based on a de-identified extract from the ANZDATA Registry (Mcdonald, Jose, Lawton, & Cass, 2018).

<table>
<thead>
<tr>
<th>Surgical risk factors</th>
<th>Non-Indigenous (n = 6003)</th>
<th>Indigenous (n = 336)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI (median IQR kg/m²)</td>
<td>26.1</td>
<td>27.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Current smokers (at commencement of RRT)</td>
<td>11%</td>
<td>26%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Diabetes</td>
<td>17%</td>
<td>46%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Coronary artery disease</td>
<td>12%</td>
<td>18%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Peripheral vascular disease</td>
<td>7%</td>
<td>10%</td>
<td>0.04</td>
</tr>
<tr>
<td>Total ischaemic time (hours, median IQR)</td>
<td>12</td>
<td>14</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Delayed graft function</td>
<td>29%</td>
<td>38%</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Weight loss approaches for the general kidney transplant candidate population

For many people on the transplant waiting list, weight loss is likely to be beneficial in reducing the peri-operative and longer-term post-transplant risk. Facilitating weight loss is particularly critical for those whose weight prevents waitlisting due to prohibitive surgical risk. A number of studies have shown that it is important to achieve a healthy BMI prior to transplantation due to the poorer post-transplant outcomes associated with significant post-transplant weight loss or gain (S. H. Chang & McDonald, 2008; El-Agroudy, Wafa, Gheith, Shehab El-Dein, & Ghoneim, 2004). While both Indigenous and non-Indigenous recipients experience negative effects from BMI loss following transplantation, the effect is greater amongst Indigenous recipients due to their higher rates of high BMI prior to transplantation (Subramani, Ullah, Majoni, Hughes, & McDonald, 2018).

Weight loss prior to kidney transplant surgery may have a number of beneficial effects in general for kidney transplant candidates, including reduced operative time and likelihood of acute rejection, and fewer surgical complications (Chan, Garneau, & Hajjar, 2015). Weight loss can also help to reverse the progression of type 2 diabetes and improve glycaemic control, albuminuria, and eGFR (Friedman, 2019; Schauer, Mingrone, Ikramuddin, & Wolfe, 2016). However, the benefits of weight loss in the dialysis patient population are less clear. There is data from observational studies for both HD and PD patients that suggest best survival is associated with BMI in the ‘overweight’ rather than ‘normal’ range (D. Johnson et al., 2000; Kalantar-Zadeh, Abbott, Salahudeen, Kilpatrick, & Horwich, 2005; Park et al., 2014). These studies have not examined the outcomes of people who lose weight as part of a deliberate health-related strategy, and there is currently no data addressing this specific issue among Indigenous dialysis patients.

Kidney transplant candidates who would benefit from losing weight prior to transplant surgery are typically recommended to undertake conservative weight loss methods in the first instance, such as lifestyle, dietary and pharmacologic interventions (Friedman, 2019). Bariatric surgery is still considered a ‘last resort’ and eligibility is typically dependent on patients having made at least one attempt at a structured weight loss program. National Health and Medical Research (NHMRC) Clinical Practice Guidelines suggest patients should only be referred for bariatric surgery if: a) their BMI is 40 or more; b) their BMI is 35 or more with obesity-related comorbidity (i.e. diabetes, cardiovascular disease or sleep apnea); or c) their BMI is 30 or more with poorly controlled type 2 diabetes and increased cardiovascular risk (NHMRC, 2013).
Conservative approaches to weight loss

Despite the importance of weight loss prior to transplantation, little is known about the best methods through which to achieve this, particularly in the setting of Indigenous dialysis patients (including low-energy diets and various community and health supports). However, cohort studies have indicated fewer than 10% of potential candidates lose some weight when requested for listing and even fewer (5%) attain the target BMI of less than 30 kg/m^2 (Howard et al., 2002).

To date, only one prospective cohort study has compared outcomes for transplant candidates who undertook a conservative weight loss regime involving a nutrition program, regular exercise, behavioural therapy and Orlistat (an oral lipase inhibitor) with a control group who were solely reliant on self-directed diet and exercise (MacLaughlin et al., 2010). Results after two years showed significantly more patients had achieved weight loss with acceptance to the wait list in the weight loss regime group (35%) compared to the self-directed diet and exercise control group (6%) (MacLaughlin et al., 2010). However, weight loss within the weight loss regime group was modest; on average, participants shed less than 10% of their baseline bodyweight over the two-year study period (MacLaughlin et al., 2010).

While it is broadly considered that significant voluntary weight loss in ESKD patients, even with intensive support, is difficult to achieve, the long-term sustainability, widespread applicability and actual benefits of a comprehensive, labour-intensive weight loss program in the kidney transplant population remains largely unknown.

Surgical approaches to weight loss

In recent years, bariatric surgery has become a safer option for weight loss and has proven to be effective in patients with ESKD, providing a bridge to transplantation for those who were previously ineligible due to morbid obesity. An analysis of United States Medicare billing claims for open bariatric surgical procedures among kidney transplant candidates and recipients in the United States Renal Data System registry from 1991 to 2004 found that of the 188 cases of bariatric surgery identified, 72 surgeries were performed pre-waitlisting, 29 while on the waitlist, and 87 post-transplantation (Modanlou et al., 2009). Of the 29 waitlisted patients, 20 proceeded to kidney transplantation after bariatric surgery (Modanlou et al., 2009). Perioperative mortality (30-day) was 3.5% for both waitlisted and transplanted patients, primarily due to cardiac and infectious complications, comparable to some trials among patients without kidney disease (Modanlou et al., 2009). Mortality between 30 and 90 days after bariatric surgery was 3.5% for transplanted patients and 0% for patients on the waitlist at the time of surgery (Modanlou et al., 2009).

A 2004 retrospective study found that bariatric surgery was safe and effectively facilitated weight loss in 30 morbidly obese patients with CKD or ESKD (Alexander et al., 2004). Of the ten patients who were on dialysis before bariatric surgery, three were waitlisted, four were scheduled for a living donor transplant, and three received a kidney transplant (Alexander et al., 2004). Only one complication was reported (abdominal wound infection). There were no perioperative deaths; the only death reported was due to cardiovascular disease, occurring 7.9 years after bariatric surgery and 6.1 years after transplantation (Alexander et al., 2004).

The same group of researchers conducted a prospective study from 2011 to 2014, during which time all kidney transplant candidates meeting National Institutes of Health criteria for bariatric surgery were referred to a multi-disciplinary clinic that included a bariatric surgeon, dietitian and coordinator.
Of 170 patients deemed eligible for both bariatric surgery and kidney transplantation, 52 (47 of whom were on dialysis) underwent bariatric surgery before the end of 2014. Among this cohort, the mean BMI decreased from 43.0 to 36.4 following surgery. The majority of patients (55.8%) achieved the ‘goal BMI’ of less than 35 kg/m² and were subsequently placed on the waitlist, with 6 patients receiving kidney transplants after bariatric surgery.

In summary, contemporary bariatric surgery techniques have proven to be effective in achieving sustained weight loss, with total weight loss averaging 20% to 35% of total body weight. In the general population, bariatric surgery has also been found to have a positive impact on type 2 diabetes and kidney function; a systematic review of bariatric surgery studies with long-term follow up reported remission rates for type 2 diabetes of 66.7% for patients who received a Roux-en-y gastric bypass, and a number of studies have identified decreases in albuminuria and proteinuria after bariatric surgery. However, bariatric surgery poses a number of substantial perioperative and postoperative risks, including infection, respiratory failure, acute kidney injury and death. These risks must be evaluated when considering patients’ suitability for bariatric procedures, and balance against the potential health gains following transplantation.

In Australia, bariatric surgery procedures have been listed on the MBS since 1992. Admissions for this surgery rose from 9,300 to around 22,700 between 2005-06 and 2014-15. In 2014-15, more than 124,600 weight loss surgery-related procedures were billed to Medicare, including those provided in public and private hospitals and in non-hospital settings. However, most of this surgery (around 89%) is carried out in private hospitals and incurs substantial out-of-pocket costs, resulting in large socioeconomic inequalities. Around 344 Indigenous weight loss surgery procedures were performed in 2014-15, with 259 of these occurring in private hospitals. Indigenous Australians had a higher rate of weight loss surgery in public hospitals than other Australians (1.6 and 1.2 procedures per 10,000 population, respectively), with the median waiting time for all elective bariatric surgery procedures being 73 days. In private hospitals, other Australians had higher rates for weight loss surgery than Indigenous Australians (8.7 and 4.7 procedures per 10,000 population, respectively). Increasing the accessibility of publicly-funded bariatric surgery is an important step in reducing health inequality and ensuring Indigenous patients, who experience higher rates of obesity and financial disadvantage, are able to undergo essential weight loss surgery when required.

**Targeted weight loss strategies for Indigenous kidney transplant candidates**

**Culturally appropriate conservative approaches**

To be successful, conservative weight loss programs that seek to treat obesity in the Indigenous patient population must be culturally appropriate, geographically accessible and offer goal attainment that is realistic. Indigenous patients’ uptake and adherence to health programs is improved when Indigenous health services and practitioners are responsible for their delivery. Recent trials have explored programmed medical yarn ups (PMYUs) in weight control as an innovative and culturally appropriate approach to obesity and chronic disease management among the Indigenous patient population. PMYU weight control programs are facilitated by a trained Indigenous health worker who leads and manages a group of six to 12 participants during six...
90-minute sessions in a convenient location every two weeks for two to three months (Stevens et al., 2018). Each session is attended by a GP, and facilitators are trained to deliver a specific weight control program whilst encouraging participants to consult the GP about aspects of their health related to weight control and associated comorbidities (Stevens et al., 2018). While the PMYU model is still being trialled to gather more evidence on its utility, it is anticipated that it will be applicable to Indigenous dialysis patients. Given the critical role of obesity as a barrier to access for transplantation, it is important to evaluate the efficacy of this program and other models already successful in the broader Indigenous patient population among kidney transplant candidates to determine if this culturally tailored approach should be adopted in mainstream renal care.

Regionalised bariatric surgery models of care

Very few studies to date have evaluated the feasibility of achieving significant and sustained weight loss in obese Indigenous Australians through the use of bariatric surgery procedures. In 2016, a prospective cohort study of 30 obese Indigenous adults from the Rumbalara Aboriginal Co-operative in Central Victoria was undertaken, with inclusion criteria including Aboriginality, BMI > 30kg/m² and diabetes diagnosed within the last 10 years (O'Brien et al., 2016). Participants were treated in their community (at the regional hospital) with laparoscopic adjustable gastric banding (LAGB) and were subsequently tracked for two years. Outcomes were compared with those of non-Indigenous Australians from an earlier randomized control trial using a similar protocol, and comparable results were identified for both weight loss and diabetes remission (O'Brien et al., 2016). Of the 30 participants, 26 completed a diabetes assessment at two years follow-up, which showed diabetes remission in 20 of the 26 participants and a mean weight loss of 26.0 kilograms (O'Brien et al., 2016). While 13 adverse events were recorded (one early and 12 late), the regionalised model of care centred on the LAGB was found to be feasible and acceptable to the participant cohort, improving quality of life and significantly reducing the prevalence of both obesity and diabetes (O'Brien et al., 2016). While this study did not specifically target kidney transplant candidates, the findings suggest that the use of regionalised bariatric surgery models of care to reduce weight, comorbidities and other surgical risk factors may improve access to the transplant waitlist and postoperative outcomes for the Indigenous ESKD patient population.

Post-Transplant Requirements

Kidney transplantation is considered the best form of treatment for most patients with ESKD, but patients face post-transplant challenges including the necessity of lifelong immunosuppression, regular clinic visits and medication side effects such as infections and cancer. The care of the kidney transplant recipient is a complex task, requiring many interactions between the patient, family, primary care provider, and multidisciplinary renal care team, including transplant physicians, infectious disease physicians, pharmacists, nurses, social workers and community health workers. Renal teams are typically spread across multiple services, including primary care services in local communities, dialysis units and hospitals in regional hubs, and major transplant centres in capital cities; levels of expertise and resource availability often differ greatly across these services.

The current Australian health workforce situation is characterised by an undersupply of health care providers in rural and remote areas, and an imbalance of specialist skills. Similarly, while a multidisciplinary health care team is essential to delivering holistic care to Indigenous ESKD patients, their contribution is hampered by the limited availability of Indigenous health workers, translators and cultural educators (Gorham, Cass, Howard, & Evans, 2016). This results in poor history-taking,
frequent miscommunications, client misunderstanding, poor adherence, lack of informed consent and ineffective service delivery (Gorham et al., 2016), all of which can imperil transplant function and prove fatal in the post-transplant context. Provision of post-transplant care is relatively ad hoc, particularly in remote communities, and models of service delivery continue to be inequitable, insufficiently planned and lack rigorous evaluation processes.

Similar to the pre-transplant journey, post-transplant assessment and treatment regimens comprise several steps, as outlined in Figure 7. Completing these steps can be demanding, especially for patients in rural and remote areas, where logistical planning and travel requirements can become all-consuming and a barrier to successful outcomes. Models of care, immunosuppression and infective prophylaxis regimens can be adapted to reduce this burden by:

- Accounting for patients’ residential location and the travel required to access assessment and treatment; and
- Linking all levels of the health care system, including primary care services, local renal units and transplant centres, to ensure patients receive consistent and holistic care.

*Figure 7: Getting and staying home after transplantation.*

**Models of Care**

Transplant models of care have commonly been designed to cater for non-Indigenous recipients (Lawton, 2015). Qualitative studies have found that Indigenous ESKD patients do not feel adequately supported by the health care system to either: a) pursue and receive a kidney transplant, or b) maintain rigorous post-transplant care requirements (Anderson et al., 2008; Devitt et al., 2017; Hughes, Dembski, et al., 2018). This suggests that tailored models of care that acknowledge the heterogeneity of the kidney transplant recipient population are needed to overcome persistent systemic biases, which are further explored in **Appendix A**.

While many health care providers want to improve the delivery of health care to Indigenous patients, competing demands - particularly competing organisational demands in a resource-constrained environment - restrict the time and resources needed to understand the complex medical, social and psychological issues that impact Indigenous patients and their experiences of the health care system (Durey & Thompson, 2012). ‘Victim blaming’ manifests when health care systems and providers do not acknowledge or address social and cultural differences, which deflects accountability for the negative effects of ‘one size fits all’ practices. These effects can result in the exclusion of cultural understandings and meanings of health that deviate from established norms, as advocated by western medicine (Durey & Thompson, 2012). A common focus of victim blaming is Indigenous patients’ non-adherence with treatment regimens - an issue that commonly arises when health care providers do not tailor their communication approach to cater for patients’ health literacy, social and environmental circumstances and cultural beliefs (Durey & Thompson, 2012). This inequity has been
observed in the Australian kidney transplant referral system, with one study finding that nephrologists’ willingness to recommend Indigenous patients for transplantation was negatively affected by the perceived immutability of ‘cultural’ causes of non-adherence (Anderson, Devitt, et al., 2012). Recognising and dealing appropriately with cultural differences is crucial to improving management of Indigenous kidney transplant recipients, and the possibility of systemic stigmatisation of patients from minority groups must be monitored and managed (Anderson, Devitt, et al., 2012).

Workforce shortages in rural and remote Australia constitute the most significant barrier in implementing effective models of care for Indigenous transplant recipients, who require specialised follow-up and regular consultations with a multidisciplinary post-transplant team. Ideally, these consultations need to be made available in rural and remote areas; the onus should not be on the patient to travel great distances on a regular basis for essential post-transplant care. Improving the coordination and delivery of care in rural and remote areas should involve a multifaceted approach, comprising: multidisciplinary post-transplant clinics, point-of-care testing, telenephrology and telepharmacy, coordinated clinical pharmacy outreach services, and consistent protocols for the use of dose administration aids.

**Current Practice**

Current renal unit and transplant centre models of care tend to be historical and have evolved differentially, with individual transplant units relying on the availability of resources rather than patient and community need. As part of this report, a series of structured interviews with transplant services from the Northern Territory, Western Australia, Queensland, Victoria, New South Wales and South Australia was undertaken. These interviews identified a number of common elements in models of care:

- Most units had an Indigenous Liaison Officer, and many used patient mentors in an organised manner, which commonly involved prior transplant patients being asked to attend education sessions and seminars to help educate future transplant patients.
- Most units offered a variety of allied health services, including pharmacist, dietician, social worker and psychologist services.
- Most units used transplant educational materials that were adapted from existing Kidney Health Australia or industry-based resources.
- Patients are usually informed about transplant as a treatment option as soon as they are diagnosed with CKD, and usually before commencing dialysis treatment.
- Most units reported that transplant workup did not typically commence before dialysis as recommended, but usually within the first 6 months of dialysis treatment.
- Most units reported that transplant workup typically takes between 3-6 months, but that Indigenous patients may take anywhere between 12-18 months to complete workup.
- Once a transplant becomes available, it is usually the local GP or nephrologist who calls the patient to inform them of its availability.
- Travel arrangements to receive the transplant are typically organised by renal transplant coordinators.
- Immediately following surgery, recipients typically spend 5-7 days in hospital.
  - Recipients typically then spend a further 4-12 weeks in the city where the transplant centre is located.
In some areas, this may be followed by a period of 4-8 weeks in a regional centre (i.e. Alice Springs, Darwin, Cairns or Townsville), prior to returning to their home community.

- Following a transplant, most units provided dosettes to recipients and assessed recipients’ understanding of each drug. Units then supported medication adherence by checking recipients’ dosettes and Webster Paks and providing regular medication education via pharmacists in the immediate post-transplant period.
- Once recipients’ medications, drug doses and clinical situation are stable, they are discharged and returned to their community, often between 3-6 months post-transplant (depending on remoteness and individual unit preferences).
- Most units offered onsite post-transplant education to kidney transplant recipients, but very few units provided outreach education sessions and telehealth options due to lack of funding and/or staff availability.
- Most units had standard immunosuppression and infective prophylaxis protocols that were applied to all patients.

A number of service provision gaps were also identified by the interviews, including:

- Most units indicated that services such as Indigenous Liaison Officers and patient mentors are only offered to patients if requested or clearly required.
- No renal units developed or provided tailored educational materials for Indigenous patients, though a handful of units gave Indigenous patients simple drawings, booklets developed by NT renal services, or videos of Indigenous patient experiences.
- No units had specific processes in place for evaluating a potential Indigenous living kidney donor, and most units expressed reluctance to engage Indigenous donors due to the prevalence of CKD and other comorbidities amongst this population.
- Very few units had specific measures in place for follow-up care after recipients returned to their home community.
- Very few units utilised telehealth to liaise with satellite sites, primary health services, outreach clinics and transplant recipients.
- Most of the units did not have a protocol in place with regard to partnering and collaborating with primary health care services, including Aboriginal Community Controlled Health Services (ACCHS), in the delivery of post-transplant care.

These findings suggest that, for the most part, current models of care are inadequate and lack a specific focus on the Indigenous patient population, particularly for those from rural and remote areas.
Acknowledging and addressing social and cultural health determinants

Recent literature has identified a series of social and cultural determinants that hamper Indigenous patients’ uptake of post-transplant support and maintenance of treatment regimens (Aspin, Brown, Jowsey, Yen, & Leeder, 2012; Davy, Harfield, McArthur, Munn, & Brown, 2016; Gibson et al., 2015; Harfield et al., 2015). Low health literacy, different cultural understandings of health, remoteness, poverty, overcrowding, poor sanitation, and a lack of basic household infrastructure, such as facilities for storage of medicines and access to clean water, have been linked to high levels of morbidity and mortality from infection (Davy et al., 2016). Similarly, a lack of communication infrastructure, such as phone and internet connection, prevents access to timely health care guidance and advice.

Box 9: Case study of an Indigenous patients’ post-transplant journey

A 48-year-old Indigenous man from a remote area, who had been on HD since 2010, was transplanted in August 2018. He was discharged on Day 4 post-transplantation, and was reviewed in the outpatient department on Day 5, when it was discovered that he had not taken some of his medications, including tacrolimus. The patient’s care progressed with multiple readmissions for ureteric complications. He was reviewed by pharmacists three times to Day 21 - on the first two occasions there were no errors, but errors in dosette packing were noted during the final review. On Day 32, he was discharged back to the regional hospital, and the transplant centre’s registrar provided a phone handover to the treating nephrologist in the regional centre. In addition to his medication dosette, the patient was provided with a typed sheet outlining his medication regime.

In the regional centre, the patient’s dose aid was changed to a Webster Pak, but the number of medications was such that the breakfast medications were packed into two columns that were clearly marked as ‘morning’ medications.

Four weeks later he was readmitted to the regional centre with rejection. On investigation, there had been a medication mix-up due to the change in format of medication, which led to the patient not taking some immunosuppressive tablets. He was then transferred to the transplanting centre, returning two months later.

The poor post-transplant outcomes that have been described can be attributed, in part, to standardised, inappropriate models of care, manifesting in numerous health system oversights, including:

- The transplant unit provided written education literature to this patient, who could not read English and had poor eyesight.
- The regional renal unit provided the patient with drug management information as part of his pre-transplant education, but this took place 2 years prior to transplantation.
- There was no ongoing education while the patient was on the transplant waitlist.
- The next time the patient received education was when he was at the transplant hospital shortly after transplant surgery, in an unfamiliar environment, separated from his social supports and usual routines.
- Despite demonstrating difficulty with medication management, the patient did not receive ongoing post-transplant pharmacy input after discharge from hospital.
- When the patient returned to his home community, he needed to commute 100km per day to attend post-transplant review.
manifesting in poorer health outcomes (Davy et al., 2016). Even in cases where such infrastructure is available, the money needed to sustain it and issues associated with sharing the phone with multiple family members and keeping mobile phones charged and functional may mean that contact between patients and health services remains problematic.

The delivery of culturally appropriate care is dependent on the health care service’s capacity to understand, respect and accommodate these social and cultural health determinants (Browne et al., 2009). However, the majority of health services do not have the resources required to respond to the needs of minority groups (Davy et al., 2016). These services also tend to operate within a set of socially constructed values and norms that are influenced by the biomedical model, which is at odds with the more holistic perspective of health commonly embraced by Indigenous peoples (Olafsdottir, 2013). The association between culturally appropriate models of care and increased engagement from Indigenous patients in the management of their own treatment has been demonstrated, and is further strengthened when care and support services are delivered by ACCHS and Indigenous health practitioners (Davy et al., 2016).

The current Kidney Health Australia Caring for Australians with Renal Impairment (KHA-CARI) Care of Kidney Transplant Recipients Guideline includes recommendations for induction therapy, immunosuppressive medications, treatment of acute rejection, monitoring kidney allograft function, preventing and treating non-adherence, and many other post-transplant care considerations (Chadban et al., 2012). While this guideline is designed to address issues relevant to the care of all kidney transplant recipients in Australia and New Zealand, it does not capture any of the aforementioned social and cultural determinants that may impact Indigenous patients’ post-transplant outcomes. The Catching Some Air project and Kidney Health Australia Indigenous Community Consultations are currently underway, comprising a series of consumer consultations across Australia (Hughes, Kelly, et al., 2018). These initiatives will help inform the inaugural KHA-CARI Guideline for the Management of CKD in Aboriginal and Torres Strait Islander Peoples to address relevant social and cultural health determinants that affect the Indigenous ESKD patient cohort (Hughes, Kelly, et al., 2018).

In addition to the development of tailored ESKD management guidelines, there are a number of other areas in which post-transplant models of care can be strengthened for Indigenous kidney transplant recipients, particularly for those in rural and remote communities.

**Point-of-care testing**

A barrier to effective post-transplant services in rural and remote Indigenous communities is limited access to pathology services. Community health services and patients may be very distant from the nearest pathology service, and it may take several days for blood samples to be transported, processed and results returned, particularly if air transport is limited. Point-of-care testing (POCT) overcomes the ‘tyranny of distance’, provides a more convenient, timely and cost effective service for the patient, and increases treatment adherence (Shephard, 2003). POCT also has other advantages specific to the Indigenous health care setting; through appropriate training, Indigenous health workers can perform POCT, thereby empowering them to take greater responsibility for the health of their own community members. For chronic care, POCT has proven to be an effective tool for improving control of chronic conditions either by reductions in HB A1c (for diabetes management) or increased time in therapeutic or target ranges for anticoagulants (Shephard, 2010). A range of POCT tests for the management of chronic illness are available in remote communities, as outlined in Table 9;
crucially, these do not currently include blood tacrolimus concentrations, which is a key factor in regular post-transplant monitoring.

*Table 9: POCT tests for chronic care (Shephard, 2010).*

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Test</th>
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<td>Glycated haemoglobin</td>
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<td>Triglyceride</td>
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<td>Total cholesterol</td>
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<td></td>
<td>High-density lipoprotein cholesterol</td>
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<td></td>
<td>Low-density lipoprotein cholesterol (calculated)</td>
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<tr>
<td>Kidney function</td>
<td>Urea</td>
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<td></td>
<td>Creatine (eGFR)</td>
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<tr>
<td></td>
<td>Urine albumin</td>
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<td>Urine albumin-creatinine ratio</td>
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</table>

The challenges faced in providing an effective POCT service in Indigenous communities are considerable. Many rural and remote Indigenous medical services experience difficult working conditions such as dust, excessive heat and/or humidity, power fluctuations, and inadequate lighting and refrigerator space, together with high rates of staff turnover (Shephard, 2013). Additionally, at present there is no Medicare rebate for POC in general practice (other than a small group of tests, such as a pregnancy test). This limits the potential uptake of POCT technology and means a thorough cost–benefit analysis is needed before making the decision to implement POCT. While there are clear opportunities to potentially improve post-transplant care by harnessing POCT, the lack of a tacrolimus assay and issues concerning the reliability of total white cell count POC tests means it is currently of limited value in this context. There are also a range of issues associated with cost, health infrastructure and staff resourcing that need to be addressed to improve POCT’s availability and sustainability in rural and remote communities (Shephard, 2013).

*Engaging ACCHS and Primary Care*

ACCHS are run by an Indigenous Board and deliver a range of services, including CKD prevention, detection and education, within a culturally sensitive health model that promotes health, treats illness, fosters community development, and provides educational resources for health professionals (Panaretto, Wenitong, Button, & Ring, 2014). Many Indigenous patients place great trust in ACCHS (Baba, Brolan, & Hill, 2014), and establishing stronger partnerships and improved coordination between renal units, transplant centres and ACCHS would help to facilitate the delivery of culturally and clinically safe post-transplant care to Indigenous patients and communities. Through Primary Health Networks (PHNs), renal units should also commit to regular liaison with primary care providers.
more broadly, including government and mainstream GPs, to ensure post-transplant support and monitoring continues after patients have returned to their community.

In communities where ACCHS are not available, telehealth options should be explored so that patients can still communicate with trusted ACCHS practitioners, either via telephone or videoconferencing. These strategies will help to redress the ongoing disadvantages faced by Indigenous patients within mainstream health care settings, which dominate funding, coverage and delivery of complex treatments (Chapman & Berggren, 2005).

_Telenephrology and telepharmacy_

Videoconferencing enables health care professionals to overcome the tyranny of distance, and nephrologists throughout Australia are now using ‘telenephrology’ to manage remote patients with ESKD (either direct to patient, or with “far end” support from clinic nursing or medical staff). Recent improvements in internet connections to remote areas, and the inclusion of telehealth among Medicare-funded health care services, has enabled the expansion of videoconferencing-based telenephrology. This is proving particularly beneficial in Northern Australia, where distances between major health care centres and communities are vast (Rohatgi, Ross, & Majoni, 2017). A retrospective audit of paediatric videoconferencing-based telenephrology in Queensland over a 10-year period (2004-2013) found that telenephrology services provided patients and their families with improved access to information and treatment support, and regional medical teams benefited from additional educational opportunities (Rohatgi et al., 2017). The use of telenephrology also led to a cost saving of $31,837 in 2013, equating to $505 saved per consultation (Rohatgi et al., 2017).

Similarly, patients in rural and remote areas have reduced access to prescribed and non-prescribed medicines, advice about the use of these medicines, and professional pharmacy services in general (Poudel & Nissen, 2016). Telepharmacy involves the provision of pharmaceutical care through the use of telecommunications and information technologies to patients at a distant location, and is already being rolled out in remote Queensland communities (Poulson, Nissen, & Coombes, 2010). In 2013, Queensland Health established the CKD Pharmacist initiative, which provides telepharmacy services to CKD patients living in rural and remote areas within the Cairns Hospital and Hinterland Health Service and the Torres and Cape Hospital and Health Service areas (Johnstone, 2017). The service is delivered by a clinical nurse, clinical pharmacist and administration officer, all of whom are based at the Cairns Hospital Renal Unit (Johnstone, 2017). The aims of the renal telepharmacy service include:

1. Increasing access to a clinical pharmacy service for geographically isolated clients.
2. Contributing to reducing the burden of chronic disease by using an intensive case management approach to support patients in self-managing their condition by adhering to medication management regimes, preventing secondary complications by improving access to screening and routine tests, and delaying the progression of CKD and the need for RRT.
3. Improving clinical outcomes from hospitals and hospital-related services by delivering tailored and community-based CKD management education, and preparing patients for RRT.

The CKD Pharmacist Telehealth Service has had continual growth since its commencement, with demand for the service rising year on year resulting in more patients receiving interventions related to their medication management regimes (Johnstone, 2017). Patient survey results suggest that the service has reduced the disruption and cost associated with travelling to tertiary health services for
face-to-face appointments, and that most patients felt more comfortable receiving telepharmacy services in their community with familiar doctors, nurses or health care workers on hand to provide support if needed (Johnstone, 2017).

The current uptake of telehealth to deliver nephrology and pharmacy services is not clear, but anecdotal evidence suggests that the use of telehealth initiatives has been very limited in both pre-transplant assessment and post-transplant management contexts. While some telehealth models have reportedly enhanced the provision of medical services to ESKD patients and are likely applicable to the Indigenous kidney transplant recipient population, their long-term viability as post-transplant models of care is dependent on the availability of appropriate infrastructure and a stable funding source.

Immunosuppression
Kidney transplant rejection occurs when a patient’s body recognises that a transplant kidney is not ‘its own’ and subsequently attacks the new kidney. Rejection is more prevalent among Indigenous kidney transplant recipients compared to non-Indigenous recipients (Rogers et al., 2006). In part, this reflects differences between the donor and recipient populations, which lead to lesser levels of immunological ‘matching’. Immunosuppressive medications comprise an essential component of post-transplant care, allowing the transplantation of a kidney from a genetically non-identical person. The optimal level of immunosuppression in kidney transplant recipients is a delicate balance between the benefit of preventing rejection and the harm of adverse effects. Following transplantation, patients require immunosuppressive medication for the duration of transplant function. Critical to this is intake of multiple different medications several times every day. A key side effect is susceptibility to infection and other complications (particularly cancer).

Graft and patient survival rates of over 80% at 5 years depending on the donor source (i.e. living or deceased) are reported worldwide, however, international differences have been identified with long-term adjusted graft failure risk significantly higher in the United States compared to Australia, New Zealand and the United Kingdom (Merion et al., 2018). Despite Australia having one of the best kidney transplant systems in the world, Indigenous recipients typically do not experience the same benefits, with graft survival rates of around 71% at 5 years post-transplant (ANZDATA, 2018) and substantially increased mortality rates, as shown in Figures 8 and 9.
Indigenous recipients’ increased rate of rejection is commonly attributed to greater human leukocyte antigen (HLA) mismatching, greater sensitisation and longer waiting time from the start of dialysis treatment. The leading cause of death among Indigenous kidney transplant recipients is infection (Boan et al., 2017). Identifying the right level of immunosuppression to prevent rejection is a major challenge when treating Indigenous patients, especially those who return to environments with high exposure to and underlying prevalence of infections (Majoni, Dole, Jabbar, Sundram, & Perry, 2012). Even with optimal immunosuppression-strategies, maintaining immunosuppression levels is reliant on patient adherence to the medication regimen.

**Barriers to medication adherence**

Medication adherence can be defined as the extent to which people follow the instructions they are given for prescribed treatments (Haynes, Ackloo, Sahota, McDonald, & Yao, 2008). Nonadherence to medication may be either an intentional decision (i.e. missing or altering doses without consulting...
healthcare professionals) or unintentional interruption to a patient's routine (i.e. forgetting to take medications) (M. J. Johnson, 2002). As categorized by the World Health Organization, five main risk factors can influence adherent behaviour: socioeconomic factors (i.e. financial difficulty, lack of transportation), health care organisational barriers (i.e. staff rotation, limited time allocated to each patient), disease-related factors (i.e. the presence of chronic disease), therapy-related factors (i.e. the presence of debilitating side effects, complex dosing regimens) and patient-related factors (i.e. communication barriers, busy work schedules, health beliefs and attitudes) (De Geest & Sabate, 2003).

Pinsky et al. (2009) undertook a retrospective cohort study of data from the United States Renal Data System to investigate the impact of nonadherence on kidney transplant outcomes using a medication possession ratio (MPR) for maintenance immunosuppression drugs. MPR is defined as the number of days medication is supplied over a 1-year time interval; for example, if a patient receives a 30-day supply of immunosuppression, but consistently refills their medication after 35 days, they would have had medication for 320 days out of 360, equating to an MPR of 89%. This study found that kidney transplant recipients with low overall adherence in taking prescribed immunosuppressive medications (defined by fair or poor MPR rankings in the first, second and third year post-transplant) had a 60% increased risk of graft failure (Pinsky et al., 2009). Despite this, nonadherence remains prevalent, with about 22% to 28% of kidney transplant recipients demonstrating poor immunosuppression adherence (Butler, Roderick, Mullee, Mason, & Peveler, 2004; Denhaerynck et al., 2005). A consistent predictor of nonadherence is adolescence, particularly those of an older age and more years post-transplantation (Berquist et al., 2008). Other risk factors include: inadequate regimen knowledge, poor mental health and health-related quality of life, low social support, substance abuse, barriers to medication adherence and poor physician-patient relationship (Fredericks & Dore-Stites, 2010).

Many Indigenous Australians share contextual factors that may detrimentally affect their engagement with the health system and their response to the significant personal demands imposed by post-transplant maintenance. As a group, Indigenous Australians have higher levels of socioeconomic disadvantage, lower educational attainment and poorer health literacy (Anderson, Devitt, et al., 2012). A significant proportion of Indigenous transplant patients also experience isolation and reduced engagement in treatment management, particularly those who return to rural and remote communities following transplantation (Anderson, Devitt, et al., 2012). However, the majority of data on adherence rates are based on anecdotal evidence. For example, Anderson, Devitt, et al. (2012) interviewed 19 Australian nephrologists to investigate how adherence affects specialists' decision-making with regard to referral for transplant. The findings indicated that while nephrologists perceived Indigenous patients as being 'risky' due to dialysis nonadherence, conflated by social and cultural factors, adherence was not systematically measured making it impossible to substantiate these claims. Additionally, very few studies have employed standard measures such as electronic monitoring and medication dispensing data to examine the association between adherence and clinical outcomes for Indigenous Australians.

While no research to date has specifically explored medication adherence among Indigenous kidney transplant recipients, a meta-analysis of rates and risk factors for nonadherence to immunosuppression after adult solid organ transplantation found that demographic factors (i.e. sex, age and ethnicity) showed little correlation with adherence (Dew et al., 2007). This is consistent with the findings of a systematic review of chronic condition management adherence in Indigenous Australians, which found no evidence that Indigenous patients’ medication adherence is lower than
for the general population (de Dassel, Ralph, & Cass, 2017). Nonetheless, de Dassel et al. (2017) identified numerous challenges experienced by Indigenous Australians requiring long-term medicines, which were raised by both providers and patients. These included: conflicting sociocultural obligations that were more important than taking medicines and often involved travelling away from one’s home community; affordability; sharing or swapping medicines; stopping medicines once feeling better; and difficulties obtaining medicines while away from home (de Dassel et al., 2017).

Indigenous patients have also reported that forgetting to take doses is a barrier to adherence, while health professionals have suggested that inadequate safe storage for medicines at home impairs adherence (de Dassel et al., 2017). Both providers and patients have called for the development and delivery of culturally appropriate resources, designed to enhance the provision of patient education about medicines and increase adherence (de Dassel et al., 2017). Additionally, health professionals have identified various potential adherence support strategies, including increased involvement of Aboriginal Health Practitioners in medication management, and simplification of dose regimens, including dose administration aids (DAAs) and once-daily dosing (de Dassel et al., 2017).

**Box 10: Dose administration aids**

Webster Paks and dosettes, depicted in Figure 10, are examples of DAAs that help remind patients when to take their medication. This is particularly useful for kidney transplant recipients, as the complexity of immunosuppression regimes increases the risk of nonadherence, and skipping or forgetting to take a dose can quickly result in cellular rejection, appearance of donor-specific antibodies and chronic rejection (Moreso, Torres, Costa-Requena, & Serón, 2015). It is important that transplant centres adopt consistent DAA protocols and promote the use of DAAs to ensure patients are equipped to self-manage the demands of immunosuppressive medications.

*Figure 10: Image of a Webster Pak (left) and dosette (right).*

*Simplifying immunosuppressive formulations*

Advances in immunosuppressive strategies over the past decades have led to significant improvements in the field of kidney transplantation. Currently available immunosuppressive agents are separated into three categories: ‘induction agents’, ‘maintenance therapy’ and ‘treatment for
rejection’ (Kalluri & Hardinger, 2012). Induction and rejection treatment is undertaken in major centres, often as an inpatient, with regimes that change frequently from day to day and are typically managed under direct oversight. In contrast, maintenance treatment needs to be undertaken at home over months and years with intermittent follow-up. This creates challenges of medical supply and oversight in remote environments, often with limited primary care support. Maintenance regimens typically include a combination of 3 different anti-rejection drugs from different classes: calcineurin inhibitors (cyclosporine and tacrolimus, known as CNIs), antiproliferative agents (azathioprine and mycophenolic acid) or mTOR inhibitors (sirolimus and everolimus), and corticosteroids (Kalluri & Hardinger, 2012). Most of these agents are twice daily formulations. In addition, patients are typically also on anti-infective prophylactic drugs, together with other medications to manage comorbidities, particularly hypertension and diabetes. An active area of development concerns the adoption of prolonged release tacrolimus formulations, which require less frequent doses and helps to address pill burden and nonadherence in kidney transplant recipients.

**Once daily and novel, long acting immunosuppressive medication**

Past research has identified a significant relationship between more frequent immunosuppressive medication dosing and decreased adherence (Ichimaru et al., 2008; Morales, Varo, & Lázaro, 2012; Weng et al., 2005). Given tacrolimus is the mainstay of immunosuppressive regimens after a kidney transplant (Matas et al., 2015), optimising adherence to tacrolimus-based regimens post-transplantation is vital to achieving good graft and patient outcomes (Abedini, Goransson, Cockburn, Kilany, & Holdaas, 2018). Tacrolimus is available as both twice-daily (immediate-release) and once-daily (prolonged-release) formulations (Abedini et al., 2018). The latter has been approved for use in many countries worldwide, including Australia, for the prophylaxis of transplant rejection in adult liver, kidney, lung and heart transplant recipients. A number of phase III trials have supported the widespread use of the prolonged-release formula, having found it to be noninferior to the immediate-release product with a similar tolerability profile (Garnock-Jones, 2015).

The prolonged-release formulation offers a simpler regimen comprising a single daily morning dose, and therefore has the potential to improve adherence to immunosuppressive therapy. A randomized controlled multicentre trial using electronic monitoring of medication intake found that adherence to the immunosuppressive regimen was significantly higher with once-daily, prolonged-release tacrolimus vs twice-daily, immediate-release tacrolimus (88.2% vs 78.8%) (Kuypers et al., 2013). Furthermore, a recent study that examined self-reported nonadherence using the Basel Assessment of Adherence with Immunosuppressive Medication Scale (BAASIS) identified a significant impact on nonadherence following patient conversion from a twice-daily to once-daily tacrolimus regimen; nonadherence declined from 66.4% (immediate-release tacrolimus) at study entry to 30.9% (prolonged-release tacrolimus) at 1 year post-conversion (Lehner et al., 2018).
Pharmacogenetic differences

Immunosuppression is of fundamental importance to the long-term survival of kidney transplant recipients. However, the immunosuppressive medications that are administered to prevent rejection in transplant recipients have a narrow therapeutic index. Under-immunosuppression results in episodes of rejection leading to either damage or loss of the kidney. Conversely, over-immunosuppression increases the risk of infection and malignancy, as well as drug-specific complications including diabetes mellitus and nephrotoxicity. Currently, immunosuppressive drug treatment tends to only be tailored in accordance with a clinical assessment of the patients’ risk of rejection or toxicity and blood drug concentrations, rather than on the basis of pharmacokinetic and pharmacogenetic profiling (Abboudi & Macphee, 2012).

While there is limited data on the pharmacogenetics of Australian Indigenous populations, there is some data to suggest that genotypes of key enzymes that metabolise immunosuppressive drugs differ between the Indigenous and Caucasian populations (Griese et al., 2001; Tucci, 2011). An Australian study is currently comparing immunosuppressant drug pharmacokinetic parameters and patient dosing requirements in Indigenous and non-Indigenous adult kidney transplant recipients (“The PK Study,” 2018). These findings will determine whether changes to immunosuppressive protocols are required to reduce immunosuppressant drug inefficacy, susceptibility to infection and toxicities in Indigenous Australians.

Infective Prophylaxis

Kidney transplantation necessitates long-term immunosuppression, which increases the risk of contracting viral, bacterial, parasitic and fungal infections (Boan et al., 2017). Analyses of ANZDATA data indicate Indigenous kidney transplant recipients experience significantly higher rates of graft loss and death compared to non-Indigenous recipients, primarily due to infection (McDonald, 2004). The administration of greater immunosuppression in response to Indigenous patients’ higher rejection rates is a probable antecedent to infective complications in Indigenous patients, though in most cases the causes are likely multifactorial (Barraclough et al., 2016). Other factors that influence the risk of infection include environmental exposure, clinical risk factors such as diabetes, substandard housing, inadequate infrastructure for sanitation and geographical location (Rogers et al., 2006).

The underlying risk of infective deaths among the broader Australian Indigenous population is substantially higher than for the non-Indigenous population. This risk increases with remoteness, indicating that environmental factors (including housing conditions and access to health services) play a key role in the manifestation of infection (Cass et al., 2001; Dey, Knox, Wang, Beard, & McIntyre,
Standardised mortality rates for infective deaths in the Indigenous community compared to the general population are 4.5-fold and 3.1-fold for males and females respectively (AIHW, 2011b). Indigenous Australians also have an increased incidence of 3.6-fold for invasive pneumococcal disease, 4-fold for sepsis and 4.6-fold for influenza compared to non-Indigenous Australians (Davis et al., 2011; Dey et al., 2016). Against this background, the immunosuppression required for successful transplantation will magnify existing infection rate discrepancies, manifesting in poorer post-transplant outcomes for indigenous patients (Boan et al., 2017).

Past research has highlighted the important differences in kidney transplant outcomes between Indigenous and non-Indigenous Australians. The 40th Annual ANZDATA Report (2017) found that there are markedly higher rates of transplant loss in Indigenous Australians, particularly evident 3 years after transplantation. Indigenous Australians also experience higher mortality rates throughout the first five years after transplantation, with the difference in survival worsening over time (ANZDATA, 2018).

A retrospective review of all kidney transplants from the Northern Territory between 1984 and 2004 found that Indigenous patients were more likely to have a transplant biopsy, acute rejection, bolus doses of steroids, monoclonal antibody treatment for rejection, longer hospitalisation stays and infection post-transplant (Rogers et al., 2006). Infection was found to be the dominant cause of death for Indigenous patients (17 of 23 deaths); in stark contrast, no non-Indigenous patients died during the study period. It was also reported that Indigenous patients had higher infection rates of skin, respiratory tract, gastrointestinal tract and blood-stream, in addition to higher rates of infection due to bacteria and fungi (Rogers et al., 2006).

In a retrospective review of 141 consecutive adult kidney transplant recipients in Western Australia between 2005 and 2011, Boan et al. (2017) found that Indigenous patients were more likely to test positive for Hepatitis B core antibody (100% vs 13.3%, \( P < 0.001 \)) and Cytomegalovirus (98.2% vs 73.2%, \( P < 0.001 \)) at pre-transplant screening and had a higher rate of pneumonia (17.9% vs 3.6%, \( P < 0.006 \)) and death in the first year after transplantation due to infection. There was also a non-significant trend of a higher rate of gastrointestinal parasitic infection, invasive fungal infection and infectious hospital admission. Of the 47 Indigenous participants included in the study, 26% died within 3 years of kidney transplantation, with infection being the attributable cause in two-thirds of cases (Boan et al., 2017).

Critique of current evidence

The evidence outlined in this chapter is diverse and comprehensive, encompassing qualitative and quantitative studies, academic and “grey” literature and anecdotal evidence from experts in the field. However, the strength of this evidence is hampered by several factors, including:

- The age of the research. Many of the cited studies date back to over 5 years ago, and some greater than a decade ago. This may mean that some of the findings reported throughout this chapter are of limited relevance to current practice, particularly given the rapid rate at which medical research advances, and changes in models of care and practices over that time.
- The specificity of the research. Very few studies have specifically explored the pre- and post-transplant barriers that affect the Indigenous Australian patient population. Where reasonable, extrapolations have been drawn. Some sections of the current evidence chapter cite research that has been undertaken with international Indigenous populations or rural and
remote Australian cohorts, which is then used to illustrate issues that may affect some Indigenous Australian patients.

- **The reliance on a relatively small group of ‘researcher voices’**. There are relative few experts and groups who specialise and publish in this area of inquiry. This means that the ideas and views presented throughout the current evidence chapter may be narrower than in reality/practice, as these findings have been generated by a group of researchers who are well known to each other, rather than a diverse cohort of consumers, families and clinicians.

- **The ad-hoc nature** of the research. In the absence of a clear national focus on this area, the nature and extent of issues examined has been determined by the availability and interest of appropriately skilled researchers, research funding, and an appropriate and supportive environment. The outcome of this is that the amount of evidence available is uneven, and not all areas are addressed.

These limitations are best addressed by:

- Instigating national conversations on this issue to engage record and document a wide spectrum of voices,
- Supporting and funding targeted research priorities,
- Undertaking further research and expanding national data collection protocols, targeting identified pre- and post-transplant knowledge and data gaps, and
- In the longer term, training and forming a more diverse environment of researchers.

**Enhancing data collection & reporting**

**Box 12: Summary of Recommendations**

1. Implement a 12-month pilot project to capture additional pre- and post-kidney transplant data points in an expanded ANZDATA data collection protocol.
2. Incorporate a specific chapter in the ANZDATA annual report on kidney transplantation among Aboriginal and Torres Strait Islander people.
3. Undertake additional data linkage and research projects that target Indigenous patients’ post-transplant outcomes, enabling identification of best practice immunosuppression, infective prophylaxis and vascular complication protocols.

The Australian and New Zealand Dialysis and Transplant Registry (ANZDATA) collects information about all people with ESKD in Australia and New Zealand who are being treated with either dialysis or a kidney transplant. It is funded by the Australian Organ and Tissue Donation and Transplantation Authority, the New Zealand Ministry of Health and Kidney Health Australia. All dialysis and transplant units throughout Australia and New Zealand provide a variety of patient data across two basic streams to ANZDATA. First and foremost, the registry is notified in ‘real-time’ (in reality, within 30 days) of key events (dialysis, transplantation, death, and loss of transplant function). In addition, a cross-sectional survey is conducted of all patients at 31 December each year.

The survey includes substantial amounts of process information about the treatment modality. For those receiving haemodialysis, this includes dialyser type, dialysis prescription, dry weight, and type of dialysis access; for peritoneal dialysis patients, episodes of peritonitis are collected, as are PET results and fluids used. Basic biochemistry (haemoglobin, calcium and phosphate) are collected for all dialysis patients. For transplant recipients, graft function, rejection episodes and immunosuppressive
drug use and dosage are recorded. This information has been critical in documenting and highlighting the problems this report seeks to address.

However, ANZDATA does not currently capture a number of critical pre- and post-transplant milestones and outcomes, which are of relevance to assessing progress and changes in this area. A 12-month pilot project involving a select group of tertiary renal health services will enable the identification of measurable and modifiable targets at both the individual and health service level that influence transplant outcomes. This is an important first step in establishing a consistent framework for collecting and reporting data on access to transplantation, which will significantly improve our understanding of the inequities that affect Indigenous patients throughout the pre- and post-transplant journey.

Facility selection
Of more than eighty tertiary renal health services coordinating care for Australians receiving RRT, fourteen services coordinate care for approximately 88% of Indigenous Australian patients starting RRT nationally each year. Four services (Royal Darwin Hospital, Alice Springs Hospital, Royal Perth Hospital and Cairns Hospital) care for 62% of all incident Indigenous RRT patients, and a further four (Fiona Stanley Hospital Perth, Royal Adelaide Hospital, Townsville Hospital and Sir Charles Gairdner Hospital Perth) care for an additional 17% of incident Indigenous RRT patients. Another six services, predominantly across NSW, care for a further 9% of incident Indigenous RRT patients. Similarly, only a small proportion of services are responsible for performing transplant surgeries on Indigenous patients, as outlined in Figure 11.

*Figure 11:* Transplant centres that performed Indigenous kidney transplant surgeries between 2008 and 2017.
It is recommended that all renal health services in Australia be invited to participate in a voluntary 12-month trial of an enhanced and expanded ANZDATA data collection protocol, which would require units to capture a number of additional pre- and post-transplant data points. However, it is anticipated that centres that are individually responsible for the care of a very small number of Indigenous RRT patients may choose to not participate. This will not have a negative effect on the trial, given the inclusion of these centres is expected to increase cost and complexity without significantly increasing the ability to explore pre- and post-transplant barriers for Indigenous RRT patients.

Patient selection
All Indigenous and non-Indigenous patients receiving RRT from participating renal health services who are covered under existing ANZDATA consent arrangements will be captured as part of the expanded data collection framework. The inclusion of non-Indigenous patients is critical, as this cohort will serve as a comparator for the Indigenous patient population, enabling meaningful conclusions to be drawn.

Data collection
Currently, ANZDATA requires all dialysis and transplant units in Australia and New Zealand to complete an annual survey at 31 December. This survey encompasses all patient events that have occurred in the previous twelve months as well as a ‘snapshot’ of all dialysis and transplant patients on those dates.

Following consultations between ANZDATA, hospitals and other data contributors, data ‘users’, consumers and relevant stakeholders, an expanded survey will be provided to transplant coordinators from participating renal units to complete. It is envisaged that the expanded survey will capture additional pre- and post-transplant data points, as outlined in Figures 12 and 13.

Figure 12: Additional pre-transplant data points.

<table>
<thead>
<tr>
<th>Eligibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Yes</td>
</tr>
<tr>
<td>• Not now (record reasons, i.e. treatable infections, comorbidities, patient preference)</td>
</tr>
<tr>
<td>• Never (record reasons, i.e. age, severe comorbidities)</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Workup</th>
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</thead>
<tbody>
<tr>
<td>• Workup completed and successful - progression to pre-transplant assessment</td>
</tr>
<tr>
<td>• Workup completed and not referred for pre-transplant assessment (record reasons, i.e. severe comorbidities)</td>
</tr>
<tr>
<td>• Workup not completed (record reasons, i.e. patient nonattendance, decision not to pursue a transplant)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Patient deemed fit and admitted to the waitlist</td>
</tr>
<tr>
<td>• Patient not admitted to the waitlist at this stage (record reasons, i.e. active infections/comorbidities)</td>
</tr>
<tr>
<td>• Patient deemed not suitable for the waitlist (record reasons, i.e. untreatable comorbidities or nonadherence)</td>
</tr>
</tbody>
</table>
The burden associated with collecting and reporting additional pre- and post-transplant data points will be reduced by incorporating drop-down list boxes, where applicable, as part of the online survey. This will improve the efficiency of the process for transplant coordinators, who will simply be required to select the appropriate option for each patient (i.e. workup completed - awaiting assessment). The survey will also include date fields where applicable, to improve the monitoring of patients’ pre- and post-transplant trajectories.

To accommodate the additional pre-transplant data points, a new section will be incorporated into the ANZDATA survey titled ‘transplant eligibility and assessment’. The additional post-transplant data points will be incorporated into the existing ‘current graft’ section of the survey. Once data collection, validation, entry and analysis has been completed, it is critical that this information be made available to patients, carers and community members in appropriate formats.

Other post-transplant variables, such as socioeconomic, housing and health-related infrastructure factors, also affect post-transplant outcomes. While these variables are difficult to measure on a national scale, work is underway to determine which of these factors contribute to poorer post-transplant outcomes among Indigenous recipients and identify possible solutions.

Feasibility and resourcing

ANZDATA has the infrastructure and expertise to manage an expanded national data collection protocol, which would enable the inclusion of a separate Indigenous transplant chapter in the ANZDATA annual report. However, the scope of the additional data collection may prove to be a burdensome undertaking for some units without additional resourcing. It is also anticipated that software modifications and more rigorous data submission requirements will create additional costs. The proposed 12-month pilot project will enable participating renal units to determine whether it is a sustainable undertaking and identify what additional resourcing they require to maintain enhanced data capture.

The risks associated with this multijurisdictional project include low renal health service recruitment rates and delays in the collection, validation, entry and analysis of additional data points. These risks
are expected to be balanced by: a) interest and support in this area from the Australian Government, b) the involvement and support of centres caring for the majority of Indigenous Australian RRT patients nationally, c) the coordinating role of the ANZDATA registry, which has a reputation for data fidelity and completeness, with ‘real-time, on-line’ data entry now the norm for almost all contributing renal services.

Other data linkage and research projects
The expansion of ANZDATA’s data collection protocol should be complemented by a number of discrete projects that specifically target identified transplantation barriers for Indigenous patients. Additional funding is required to facilitate the implementation of proposed projects, which include:

- Linking national hospital separations data to the ANZDATA database to allow examination of episodes of admitted patient care, including post-transplant hospitalisations due to infective complications.
  - This would facilitate a comprehensive comparison of Indigenous and non-Indigenous patients’ post-transplant outcomes and would enable a longitudinal examination of the frequency of complications for both patient populations.
- A 24-month multicentre prospective cohort study of Indigenous Australian kidney transplant recipients to investigate the occurrence of and antecedents to post-transplant infective complications and vascular events.
  - This study would also facilitate an examination of the efficacy of infective prophylaxis and vascular complication protocols for Indigenous kidney transplant recipients.
- An adaptive national platform trial to study the best immunosuppression, antibiotic, antiviral and antifungal therapies for Indigenous kidney transplant recipients.
  - This would enable a simultaneous study of multiple therapies for Indigenous kidney transplant recipients, resulting in the identification of the most effective therapies for this patient population.
Pre-Transplant Knowledge Gaps and Recommendations

Knowledge and data gaps

Informing patients

Patient education in general does not currently have a strong disciplinary focus in Australia, with literature describing best practice transplant education and information sharing processes primarily originating from the United States. In particular, there is a dearth of published research on PNP for Australian Indigenous populations, and no studies to date have explored the impact of PNPs in the Indigenous kidney transplant candidate population. As a result, the most effective and appropriate methods and timing of transplant education initiatives for Indigenous ESKD patients remains largely unknown.

Similarly, while past research has advocated for culturally tailored pre-transplant education programs for Indigenous patients, there are some significant knowledge and data gaps around whether culturally informed health service-level interventions are able to effectively reduce cultural biases in the Australian context. Priority gaps that need to be addressed include:

• Determining the relationship between existing cultural awareness programs and the extent to which health services deliver culturally informed care;
• Exploring whether health service-level interventions (such as those that seek to improve patient-practitioner communication) improve either patient perceptions of bias, practitioner biases, or both; and
• Analysing whether these interventions are able to improve patient-centred outcomes (such as patients’ sense of empowerment in making informed health care decisions).

Completing workup and assessment

Although recent studies have described differences between Indigenous and non-Indigenous patients’ likelihood of being placed on the transplant waitlist, this did not extend to a description of the barriers

Box 13: Summary of pre-transplant barriers

Indigenous patients face multiple, complex barriers to accessing pre-transplant information and education, assessment and workup. Many of these barriers also impede Indigenous patients’ ability to stay healthy on the waitlist, reducing their chances of receiving a transplant. Pre-transplant barriers include:

• Low health literacy and challenges in understanding the transplantation process;
• Lack of access to culturally appropriate information and education programs;
• Lengthy cultural processes for making important health care decisions;
• Lack of appropriate structures for patient and community involvement in the patient’s journey to transplantation;
• Competing family priorities and cultural obligations;
• Late referral to dialysis negatively impacting ensuing treatment phases;
• Geographical barriers, which pose numerous social, cultural and economic challenges that have the potential to significantly delay access to support, assessment, workup and treatment; and
• Higher prevalence of surgical risk factors, including obesity and diabetes.

Indigenous patients face multiple, complex barriers to accessing pre-transplant information and education, assessment and workup. Many of these barriers also impede Indigenous patients’ ability to stay healthy on the waitlist, reducing their chances of receiving a transplant. Pre-transplant barriers include:

• Low health literacy and challenges in understanding the transplantation process;
• Lack of access to culturally appropriate information and education programs;
• Lengthy cultural processes for making important health care decisions;
• Lack of appropriate structures for patient and community involvement in the patient’s journey to transplantation;
• Competing family priorities and cultural obligations;
• Late referral to dialysis negatively impacting ensuing treatment phases;
• Geographical barriers, which pose numerous social, cultural and economic challenges that have the potential to significantly delay access to support, assessment, workup and treatment; and
• Higher prevalence of surgical risk factors, including obesity and diabetes.
to waitlisting. Currently, the only data available across units is the final stage of the process – placement on the waiting list. Consistent information on the proportion and characteristics of the patients with ESKD who may be suitable for transplant waitlisting, and barriers resulting in delays in the identification and workup processes of suitable patients, is not available. Further research is required to investigate the potential causative role of socio-demographic factors, including first language spoken, education level, health literacy, housing status and remoteness. There is also limited data on the most prevalent reasons for non-completion of pre-transplant requirements, including attendance at assessment and workup appointments. Improved data collection processes are needed to monitor progress in this area, and inform future interventions that specifically target those variables found to impede Indigenous patients’ ability to be successfully waitlisted.

Surgical assessment

Very little is known about the antecedents and prevalence of surgical complications in the Indigenous kidney transplant recipient cohort, and further research is required to identify:

- The best obesity metrics for the Indigenous ESKD patient population;
- The most prevalent surgical risk factors for the Indigenous ESKD patient population, and the best strategies to address these prior to surgery; and
- The most prevalent surgical complications among Indigenous kidney transplant recipients, and the best approaches to prevent and treat their occurrence.

There also remains a paucity of data on the benefits and risks associated with both conservative weight loss strategies and bariatric surgery for Indigenous kidney transplant candidates. Specific knowledge and data gaps include:

- No weight loss programs to date have been tailored for Indigenous patients with ESKD.
  o Evaluations of culturally informed health and weight loss initiatives that are delivered to the broader Indigenous population (such as the PMYU model and NSW Aboriginal Knockout Health Challenge) should be used to guide the development of targeted pilot projects for the Indigenous ESKD patient cohort.
- No studies to date have specifically explored the health potential of bariatric surgery for the Indigenous ESKD patient population.
  o Given the prevalence of obesity is significantly higher among Indigenous Australians compared to the non-Indigenous population, it is critical that future research examine the impacts of bariatric surgery on this cohort to determine whether it is safe and effective in facilitating access to kidney transplantation.
Next steps and recommendations for research, practice and policy

**Box 14: Summary of recommendations**

**Consumer Engagement and Education**
1. Trial and evaluate the adoption of patient navigator programs and yarning circles in pre-transplant protocols.
2. Pilot culturally informed transplant education interventions, including remote language centres.

**Improving Equity and Access to Transplant Services**
3. Evaluate and leverage existing initiatives that target cultural bias in health services to facilitate the rollout of best practice pre-transplant care and support interventions for Indigenous transplant candidates.
4. Ensure Indigenous transplant candidates are connected with primary care services earlier in the ESKD treatment continuum, to enable health issues to be addressed prior to workup.
5. Trial and evaluate weight loss strategies for Indigenous kidney transplant candidates, including conservative, culturally tailored weight loss programs and bariatric surgery.
6. If an empirical evidence base supports the use of bariatric surgery for Indigenous kidney transplant candidates, increase funding for bariatric surgery procedures in public hospitals.
7. Trial a multidisciplinary pre-transplant clinic in one major regional centre for 12 months, prioritising the availability of dental and cardiac services, as well as travel and accommodation support for rural and remote patients.
8. Fund relevant medical and allied health services and positions in regional centres to facilitate the delivery of specialist transplant support outreach services, complementing regional pre-transplant clinics and improving coordination of appointments and services.

**Researching, Developing and Implementing Clinical Guidelines and Protocols**
9. Evaluate the impact of immunological matching at the epitope (eplet) level for allocation of deceased donor kidneys.

**Workforce Training and Development**
10. Implement recruitment and training strategies for the renal workforce, particularly in remote areas, to improve the delivery of culturally appropriate pre-transplant care.
11. Implement transplant-specific ‘train the trainer’ workshops for Indigenous health workers.

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**Consumer Engagement and Education**

It is recommended that renal units, transplant centres and local treatment providers jointly develop culturally informed and region-specific health literacy assessments and education programs, which will require dedicated staff resourcing. Appropriate educational programs and material will, by necessity, take many forms and require input from a variety of personnel including consumers, clinicians, communication and media specialists.

A general information program should be developed for the Indigenous dialysis patient population and community more broadly, with more specific education resources available for Indigenous kidney transplant candidates undergoing assessment. Information should be articulated in the most appropriate language and format, using accessible technologies, and covering the following topics:
• Donor and recipient medical suitability criteria;
• The processes to be wait-listed for transplantation;
• The expected timeframe to achieve a decision for transplant suitability;
• The role of local renal and transplant units in kidney transplant assessment and care; and
• Operative and post-transplant care.

Patient navigator programs

Models of care with similar characteristics to PNPs have proven effective in other areas of Indigenous health, and early indications from Canadian trials suggest that PNPs can reduce the disparities in health outcomes for Indigenous people. In accordance with insights from recent consumer engagement research (Hughes, Dembski, et al., 2018), Australian transplant centres should trial and evaluate the adoption of PNPs to determine: a) their impact on improving access to the transplant waitlist for Indigenous patients, b) their impact on improving medication adherence and post-transplant outcomes, and c) what navigator characteristics have the greatest influence on outcomes (i.e. Indigenous background, lay person, practical or emotional support).

Yarning circles

‘Yarning circles’ may prove to be a valuable addition to transplant education programs, as they provide a more effective and culturally appropriate communication platform for Indigenous patients. In Australia, Indigenous peoples recognise yarning as a conversational process that involves a meeting of peers or participants of similar status for discussion and exchange of views. To date, health and research organisations, including Kidney Health Australia, the Menzies School of Health Research and the Australian National University, have primarily used yarning circles as part of consumer engagement research projects. Very few health services have trialled yarning circle programs as a way to provide more culturally appropriate education and support to Indigenous patients. It is recommended that transplant centres trial the use of yarning circles amongst the Indigenous kidney transplant candidate population, which will necessitate resourcing of yarning circle facilitators, such as Indigenous health workers and interpreters. A rigorous analysis will be required to determine whether this communication method improves the facilitation of kidney transplant knowledge and offers any further insights into Indigenous patients’ perceived barriers to accessing a transplant.

Remote language centres

The delivery of culturally appropriate health services in remote Indigenous communities would be aided by the establishment of ‘language centres’, particularly in areas where English is a second or even less commonly spoken language for the local Indigenous population. These centres would comprise a team of Indigenous translators and interpreters trained in the transplant treatment pathway. Working in remote communities across Australia, their main responsibilities would include:

• Establishing a set of bridging terms and concepts for contemporary medical terms and concepts, from the Indigenous language of the region to English; and
• Developing word dictionaries and other resources to aid health professionals in delivering culturally appropriate transplant support and care.

Improving Equity and Access to Transplant Services

Evaluating and leveraging health service-level interventions that target cultural biases

While cultural capability training has been advocated in previous research, no applied research has been undertaken to understand the effect of this training on health service delivery in the context of
pre-transplant workup, assessment and referral. Further investigation is required to assess the efficacy of health service-level interventions in reducing cultural biases among renal unit and transplant centre staff for the Indigenous kidney transplant candidate cohort. This research will feed into the development of cultural safety resources and programs that have been proven to address underlying cultural biases in health service providers.

Earlier engagement of primary care services
In light of the barriers faced by Indigenous patients to accessing pre-transplant assessment and workup tests, particularly those located in rural and remote areas, alternative service delivery models need to be developed and tested. It is critical that these models are regionally specific to account for the great diversity in settings and contexts across the country.

One possible intervention involves the earlier engagement of primary care services, such as dental check-ups and women’s health assessments, to improve patients’ general health prior to commencing dialysis. Indigenous transplant candidates present with significant comorbidities at a much higher rate than non-Indigenous patients. These comorbidities, including skin, respiratory and urinary tract infections, cardiac disease and poor oral health, commonly require further investigation and multispecialty treatment, which complicate and delay the pre-transplant workup process. As a result, connecting patients with relevant primary health care services as early in the CKD/ESKD treatment continuum as possible may help to eliminate one of the major causes of delay in the pre-transplant workup process.

Implementing and evaluating conservative prevention and weight loss initiatives for overweight and obese Indigenous kidney transplant candidates
While Australia’s Closing the Gap strategy is heavily focussed on the prevention of chronic disease in the Indigenous population, the adoption of healthy lifestyle choices is equally important for those who have already developed a chronic condition. As such, holistic weight loss projects tailored for Indigenous patients with ESKD should be piloted to determine whether conservative strategies, including nutrition education, exercise and behavioural therapy, can effectively reduce weight and comorbidities, and thus facilitate improved access to the transplant waitlist. The time, cost, adverse events and benefits of these pilot projects must be thoroughly evaluated to determine whether the rollout of a tailored, full-scale weight loss program for the Indigenous kidney transplant candidate population is feasible and worth pursuing.

Investigating the efficacy of surgical approaches for Indigenous patients who are ineligible for waitlisting primarily due to weight
Further research is required to thoroughly evaluate both the peri-operative safety and long-term outcomes of bariatric surgery in kidney transplant candidates, particularly in the high-risk Indigenous ESKD patient population. Given past research has primarily explored open bariatric surgery procedures, additional investigation is required to determine the safety and efficacy of laparoscopic methods, which is now commonly considered to be the approach of choice. Another area for future exploration concerns whether the pharmacokinetics of immunosuppressive drugs are altered in the setting of bariatric surgery, which may impact kidney transplant recipients who are required to maintain an intensive immunosuppressive regimen.

Prospective, clinical study of the effect of bariatric surgery in Indigenous transplant candidates
An interventional clinical trial is needed to determine the effects of bariatric surgery in adult Indigenous kidney transplant candidates who are unable to be waitlisted, or are at risk of poorer
transplant outcomes, due to obesity and/or associated comorbidities. Effects of interest comprise the pharmacokinetics of immunosuppressive medication, height, weight, BMI, abdominal circumference, blood pressure, glycated haemoglobin, average daily insulin requirements, lipid profile, thyroid-stimulating hormone levels, 24-hour urine creatinine clearance and quality of life.

Proposed primary outcome measures include:
- Placement on the transplant waitlist.
- Weight loss achieved after bariatric surgery in the ESKD patient.
  - Time frame: baseline and every 3 months.
- Changes in health-related quality of life score.
  - Time frame: baseline and 1 year after bariatric surgery.

Proposed secondary outcome measures include:
- Changes in the pharmacokinetics of oral immunosuppressive medications due to bariatric surgery, comparing pre-bariatric surgery to 12 months post-operative.
  - Time frame: pre-bariatric surgery and 1 year after bariatric surgery.
- Changes in blood glucose levels.
  - Time frame: baseline and 1 year after bariatric surgery.
- Changes in the number and dose of medications required to treat co-morbidities including hypertension, hyperlipidaemia and diabetes mellitus.
  - Time frame: baseline and 1 year after bariatric surgery.
- Incidence of complications following bariatric surgery.
  - Time frame: 1, 6 and 12 months after bariatric surgery.

To be eligible for inclusion, it is proposed that participants must: be over 18 years of age, identify as Aboriginal or Torres Strait Islander, have a BMI greater than 35, be currently receiving dialysis and have no major comorbidities that would prevent waitlisting. Proposed exclusion criteria include: medically unfit for surgical intervention, previous gastric or intestinal surgery, active gastric disease, pregnancy or lactation, and active infection.

*Increasing funding for bariatric surgery procedures in public hospitals*

The heavy economic burden of obesity and its comorbid conditions may be alleviated in the long term by surgical management, despite upfront resource costs. Severely obese individuals incur twofold higher mean annual health care costs ($2788 v $1472) and use double the number of medications annually (11.4 v 5.3 per person) compared with the general population (Lukas et al., 2014). Weight loss surgery can reduce the number of medications required and lower individual health care costs by 26%, a direct saving of $506 per person annually (Lukas et al., 2014). In the context of ESKD, bariatric surgery may provide the only opportunity for obese transplant candidates to be waitlisted for a kidney, which is more likely to be an issue among Indigenous patients. However, bariatric surgery is least accessible to those who are likely to be in the greatest need, due to the lack of funded bariatric surgery procedures in the public sector. It is thus recommended that the Federal, state and territory governments consider increasing the supply of publicly funded bariatric surgery in Australia.

*Establishing multidisciplinary pre-transplant clinics in major regional centres*

Multidisciplinary pre-transplant clinics offer an efficient and effective way to provide care for kidney transplant candidates and improve coordination between the tertiary and primary care sectors. The establishment of ‘one-stop shop’ multidisciplinary pre-transplant clinics in major regional centres...
would improve rural and remote patients’ access to essential pre-transplant workup and assessments. However, the successful implementation of these clinics is dependent on:

- Funding for additional medical and allied health positions in regional areas;
- Travel and accommodation allowances for remote patients, who will still be required to travel substantial distances to reach their nearest regional centre; and
- Rigorous, nationally standardised evaluations, to determine each regional clinic’s effectiveness in facilitating improved access to transplantation for Indigenous patients.

Improving the design of specialist transplant outreach services
Maintaining active waitlist status is dependent on patients’ ability to access relevant specialist services regularly. Past research has comprehensively described barriers to accessing specialist services for Indigenous patients, particularly those in rural and remote areas, as well as issues around specialist outreach program design, sustainability and impact. Evidence shows that specialist outreach services enable up to 90% of specialist consultations to be delivered in the community setting within 12 months of referral, without patients needing to travel to hospital outpatient clinics (Gruen, Bailie, Wang, Heard, & Rourke, 2006). However, a number of changes should be made to the design and implementation of future specialist outreach services to ensure their sustainability and effectiveness for kidney transplant candidates, including:

- Outreach services should be delivered by a multidisciplinary team of specialists rather than one or two practitioners in isolation. This will require the recruitment of more specialists to commit to the delivery of regular outreach, and efforts should be made to ensure that outreach activities are valued within health care organisations and systems.
- The coordination of outreach services can be improved by implementing long-term planning of visits that are scheduled in accordance with community need, rather than scheduling visits only a few weeks in advance when transplant candidates may already have made plans to travel to regional or metropolitan hubs for specialist appointments.
- In addition to responding to community needs, outreach visits should be accountable to the referring practitioner and community, provide an appropriate mix of clinical services, education and support, utilise education and training opportunities, and deliver reliable correspondence and good communication.
- To maximise the efficacy of specialist outreach, primary care services must be adequately resourced and staffed. It is critical that specialist outreach be integrated with primary care services to prevent disruptions to the provision of transplant care.
- Specialist outreach services should be complemented by the use of telenephrology to fill service gaps between scheduled community visits.

Researching, Developing and Implementing Clinical Guidelines and Protocols

Determining immunological compatibility using both broad antigen and eplet HLA matching
Indigenous patients’ longer waiting times for transplantation are in part attributed to the HLA-antigen mismatch between donors and potential Indigenous transplant candidates. Previous research has found that structural matching at the epitope level (i.e. polymorphic amino acid sequences such as eplets that bind to anti-HLA antibody) may provide a more accurate assessment of immunological risk compared to HLA matching at the broad antigen level. One study that compared the benefits and costs of incorporating an eplet-based matching algorithm to the current allocation of deceased donor kidneys to Indigenous Australians found that the average waiting time for transplantation for 5
recipients (15% of the participant cohort) was reduced by an average of 23 months (Do et al., 2015). In addition, the study identified an average incremental gain in 0.004 quality-adjusted life years, with average savings of $3860 using this allocation compared to the current (Do et al., 2015). Further research is required to more precisely define the epitopes of each HLA allele in Indigenous people, which are dissimilar to those of non-Indigenous people and are critical in the future application of HLA eplet-based matching in this population.

Workforce Training and Development

Engaging and training a culturally capable renal workforce

In order to improve transplant centres’ ability to address the unique needs of culturally diverse kidney transplant recipients, a range of workforce training and development strategies should be explored, particularly in rural and remote communities. These include:

- Integrating cultural awareness training as part of curriculum and continuous professional development for all renal unit and transplant centre staff;
- Diversifying the spread of specialist training positions across rural and remote Australia, and encouraging all renal registrars to undertake an Indigenous community rotation; and
- Increasing the recruitment, training and utility of Indigenous health workers, patient navigators and interpreters nationally, and equipping them with renal knowledge so they can support Indigenous kidney transplant recipients in fulfilling pre-transplant requirements.
- Establishing stronger partnerships with ACCHS and primary care services more broadly to improve the delivery of culturally appropriate transplant care and support services.
- Upskilling primary care providers, including GPs, nurses, and Indigenous health workers, in the delivery of transplant education and care.

Implementing ‘train the trainer’ workshops for the Indigenous health workforce

‘Train the trainer’ workshops for Indigenous interpreters, health care navigators and health workers need to be implemented across Australia, in metropolitan areas, regional hubs and remote communities, to ensure the Indigenous health workforce is appropriately trained in transplant knowledge and practice before engaging directly with transplant candidates and recipients. While growing the Indigenous health workforce is an important step in facilitating culturally capable education and communication for Indigenous patients, high quality education, support and care can only be provided if the workforce is equipped with a detailed knowledge of kidney issues and the dialysis/transplant journey. In addition to the workshops, new or less experienced Indigenous health workers should be paired with a more senior and experienced Indigenous ‘mentor’, who can provide ongoing support and guidance beyond the workshop setting.
Post-Transplant Knowledge Gaps and Recommendations

Box 15: Summary of post-transplant barriers

Indigenous transplant recipients experience significantly poorer post-transplant outcomes compared to non-indigenous recipients. Standardised models of care, including ‘one size fits all’ immunosuppression and infective prophylaxis protocols, is thought to contribute to this disparity. Specific post-transplant barriers include:

- Low health literacy and sociocultural challenges that impede adherence to complex post-transplant care and maintenance requirements;
- Limited access to post-transplant treatment, assessment and support services, including pathology and pharmacy services; and
- Higher risk of exposure to infection, particularly in remote communities where substandard housing and inadequate infrastructure for sanitation is more common.

Knowledge and data gaps
Models of Care

The Menzies School of Health Research recently investigated how different dialysis treatment models impact on patients, families and other service providers, however, no such work on transplant models of care has been done in Australia. While this chapter has provided a brief overview of current practice and strategies that may facilitate improved post-transplant outcomes, specifically for the Indigenous patient population, it is important that further research be undertaken to comprehensively address this evidence gap.

The need to tailor models of care for Indigenous patients with chronic disease rather than simply apply existing models has been comprehensively documented in the literature, but the majority of research in the Indigenous health field to date has adopted a descriptive approach. While descriptive research provides valuable information on health patterns and determinants, it does not produce change nor provide any direct evidence on how to best create change (Sanson-Fisher, Campbell, Perkins, Blunden, & Davis, 2006). It is therefore critical that future efforts prioritise intervention research to facilitate effective change in models of care and improve post-transplant outcomes for Indigenous patients.

One intervention that has been frequently proposed in the setting of care for chronic disease in remote areas is POCT. Actual clinical trials or large-scale reviews to assess the effectiveness of POCT are much less numerous than publications that describe the potential risks associated with POCT, issues with specific tests or with specific devices. A systematic review of current models of POCT in Australia, including the Quality Assurance for Aboriginal and Torres Strait Islander Medical Services Program, State-wide i-STAT network, and Integrated Cardiovascular Clinical Network SA, should be undertaken to inform the development of new models that are specifically designed to enhance post-transplant pathology testing and the quality of clinical care in remote Indigenous communities.

Previous research has posited that telepharmacy has the potential to improve health outcomes for patients requiring chronic disease management and improve quality of service delivery in the primary care setting, particularly for patients based in rural and remote areas (Johnstone, 2017). However, while telepharmacy offers potential benefits and efficiencies, evidence of its effectiveness and economic impact is far from extensive. Pharmacy regulation laws, operational difficulties, start-up
costs, data security issues, and patients’ reluctance to use technology all pose significant barriers that may inhibit the successful uptake of telepharmacy in remote communities (Poudel & Nissen, 2016). A rigorous analysis of telepharmacy’s pros and cons is needed to justify an extended rollout across rural and remote Australian communities to aid post-transplant medication management. Furthermore, a systematic review or meta-analysis would help to strengthen the telepharmacy literature by providing a more precise measurement of telepharmacy’s effects (i.e. increased access to pharmacist advice and medicines).

Immunosuppression
Despite anecdote and opinion (Anderson, Devitt, et al., 2012), there is a paucity of data that accurately identifies rates and causes of nonadherence in Indigenous kidney transplant recipients. Therefore, the role nonadherence plays in poor health outcomes in Indigenous recipients remains largely unknown although often debated. Similarly, while past research has advocated for a range of targeted adherence support strategies for Indigenous Australians, the efficacy of these strategies has not been evaluated. Additional evidence on the activities that effectively support Indigenous Australians requiring long-term medication, including immunosuppressant drugs, is needed to aid the development and implementation of culturally appropriate adherence education and support resources.

There is evidence in the general population that once-daily medication dosing is associated with better uptake and adherence. The use of this strategy post-transplantation is erratic, and there is no current evidence about the best implementation approach. While prolonged-release tacrolimus has demonstrated good efficacy and tolerability in clinical studies, adherence data after conversion from immediate-release tacrolimus are limited in kidney transplant patients, and no studies have specifically investigated its impact in the Indigenous patient population. These knowledge gaps also apply to novel approaches, such as immunosuppressive agents that require intermittent administration from a clinic base (i.e. belatacept).

Previous research has found that Indigenous kidney transplant recipients suffer poorer post-transplant outcomes compared to non-Indigenous recipients, driven in large part by higher rates of infective complications. Although this observation supports the development of tailored immunosuppressive regimens for this patient population, in current clinical practice Indigenous patients are still treated with similar immunosuppressive protocols, at similar doses and target concentrations to those administered to non-Indigenous patients. It is critical that future research comprehensively assess Indigenous Australians’ immunosuppression burden through pharmacokinetic and pharmacogenetic profiling to facilitate the development of tailored immunosuppressive protocols for this cohort.

Infective Prophylaxis
Previous studies have demonstrated that Indigenous Australians suffer markedly higher rates of morbidity and mortality due to infective causes, however, the scope of these studies was limited to two individual jurisdictions (i.e. exclusively analysing patients from the Northern Territory and Western Australia). It is important that future work involves a nationwide exploration of the antecedents to serious infection in Indigenous kidney transplant patients, including an analysis of jurisdictional and regional differences, to enable the introduction of regionally specific infective prophylaxis strategies in Australian renal units. The establishment of a national prophylactic protocol
for Indigenous kidney transplant recipients is also critical to improve consistency of care across jurisdictions and aid coordination between renal units and primary care providers.

While a range of social and environmental factors have been theorised to promote infection risk in Indigenous recipients, particularly those returning to a rural or remote community, few studies have explored this association in depth. Future research should seek to identify the specific challenges that pose a risk to the health of Indigenous transplant recipients and evaluate the efficacy of initiatives and modifications that target either behaviour or the environment. A greater focus on Indigenous patients' health literacy is also critical to reduce the disparity in post-transplant outcomes. The development and evaluation of culturally informed and region-specific patient education programs and practices is needed to ensure Indigenous transplant recipients fully understand post-transplant care recommendations and relevant maintenance responsibilities. Evaluation of region-specific programs could then serve to inform the establishment of national guidelines for Indigenous patient education.

For all transplant recipients, various methods to prevent infection post-transplantation are in use. However, little is known about the efficacy of various prophylaxis approaches among the Indigenous kidney transplant recipient cohort. Gaps include: pre-transplant screening and vaccination measures; environmental initiatives, such as educating patients about the importance of sanitation and good dietary habits; and the best peri- and post-transplant antimicrobial regimes to prevent the manifestation of common bacterial, fungal and viral infections (such as CMV). The identification and ongoing monitoring of key data points, including baseline immunological screening, post-transplant hospitalisations and active infections, is needed to determine the success of infective prophylaxis protocols, particularly those that are tailored for Indigenous kidney transplant recipients.
Next steps and recommendations for research, practice and policy

**Box 16: Summary of recommendations**

**Consumer Engagement and Education**
1. Pilot culturally informed transplant education interventions, including culturally tailored immunosuppression adherence education videos.

**Improving Equity and Access to Transplant Services**
2. Trial a multidisciplinary post-transplant clinic in one major regional centre for 12 months, prioritising the availability of dental and cardiac services, as well as travel and accommodation support for rural and remote patients.
3. Conduct a study on transplant models of care to quantify the costs for rural and remote Indigenous patients to inform the development of a needs-based funding model.
4. Undertake a systematic review of Australian POCT models to guide the development of a post-transplant care POCT program, comprising new POCT measures that enable the monitoring of renal function and immunosuppressive drug levels in kidney transplant recipients.
5. Subsidise POCT tests that have been validated by empirical evidence.
6. Investigate the value of telenephrology and telepharmacy programs for kidney transplant recipients living in rural and regional areas.
7. Design and implement a remote community pharmacist trial to facilitate improved awareness and knowledge of transplant related maintenance requirements among Indigenous kidney transplant candidates and recipients.
9. Broaden the list of eligible prescribers for the Closing the Gap (CTG) PBS Co-payment Measure to include transplant centres.

**Researching, Developing and Implementing Clinical Guidelines and Protocols**
10. Establish a national dose administration aid protocol and a consistent format for drug information.
13. Revise immunosuppressive protocols based on relevant findings from the pharmacokinetic study of immunosuppressives in Indigenous transplant recipients.
14. Design and undertake research projects to identify the antecedents to infective episodes.
16. Adopt coordinated, nationally consistent clinical data collection, analysis and reporting protocols of infective complications across renal units.
17. Implement a tailored prophylactic protocol for Indigenous transplant recipients.

**Consumer Engagement and Education**

*Trialling the use of culturally tailored immunosuppression adherence education videos*

Past research has found that Indigenous Australians with chronic conditions are inadequately supported by health professionals to comply with post-transplant care recommendations, particularly
with regard to taking medication. Confusion over medicines, perceived lack of advice from health professionals to patients about medicines, and challenges in having effective interactions with medical practitioners and pharmacists all contribute to the manifestation of non-adherence. While tailoring the therapeutic regimen to the needs of the patient (including through prolonged release formulations) is a step in the right direction, these efforts need to be bolstered by complementary educational measures that address cultural, social and geographic barriers.

Indigenous ESKD patients have reported that they value hearing about other Indigenous patients’ stories in order to understand the dialysis and transplant journey and its associated demands. Kidney Health Australia and the Menzies School of Health Research have produced a number of educational videos that showcase Indigenous patients’ experiences, but none to date have specifically focussed on the importance of adherence and strategies to ensure the immunosuppression regimen is maintained. As such, culturally tailored immunosuppression adherence education videos should be developed and trialled using a number of platforms, including YouTube, Vimeo and DVD. The success of these videos will be dependent on promotion from health care professionals and patient navigators to ensure patients are aware of the video’s existence and can easily access the relevant content.

Improving Equity and Access to Transplant Services

**Establishing multidisciplinary post-transplant clinics in all major regional centres**

Following a kidney transplant, recipients are educated by a multidisciplinary health care team to self-manage their complex medical therapy. However, continued involvement from specialists and allied health providers is vital to ensure recipients are appropriately supported to maintain their transplant. A number of strategies have been identified to mitigate workforce shortages in rural and remote areas and improve the coordination and delivery of post-transplant care for Indigenous recipients.

It is important that multidisciplinary post-transplant clinics, comprising nephrologists, nurses, pharmacists, dieticians, social workers and Indigenous health workers, be made available in major regional centres to assist Indigenous recipients in managing their post-transplant care and facilitate improved coordination between transplant centres and primary care services. Similar to pre-transplant clinics, the successful implementation of post-transplant clinics is dependent on:

- Funding for additional medical and allied health positions in regional areas;
- Travel and accommodation allowances for remote patients, who will still be required to travel substantial distances to reach their nearest regional centre; and
- Rigorous, nationally standardised evaluations, to determine each regional clinic’s effectiveness in facilitating improved post-transplant outcomes for Indigenous patients.

**Developing a needs-based funding model for relocation**

The consequences of relocation for kidney transplant treatment and post-transplant care are pervasive. Families are often separated or whole families relocate, sometimes interstate, in order to access transplant centres. For some, the need to relocate from family and country may lead to a decision to forego treatment. In almost all people, the impact of kidney failure on the patient and their family is severe with prolonged ill health, a heavy symptomatic burden, loss of job opportunities and ability to work, financial hardship and very real social disruption (KHA, 2018b). There are major challenges in the health and social support area for Indigenous patients undergoing kidney transplantation away from home, and recent literature has identified a need for improved social and financial support services when relocating Indigenous patients and their families to urban centres for transplant assessment, treatment and extended post-transplant monitoring (Gorham et al., 2017).
As a first step, further analysis is required to accurately quantify the cost of relocation for Indigenous transplant patients, covering urban housing, social support and transport expenses. This research should then be used to inform a needs-based funding model to help combat the multifaceted economic and social challenges that impede the pursuit of transplantation for Indigenous patients.

**Facilitating the broader rollout of sustainable post-transplant POCT**

Given the cost of POCT to the community is considered to be the most significant barrier to its wider implementation, POCT measures that have been found to be non-inferior to pathology laboratory testing (i.e. tests for measuring glycated haemoglobin, urine albumin, albumin-creatinine ratio, total cholesterol and triglyceride levels) should be added to the MBS so that they are covered under Medicare. Furthermore, new POCT measures that enable ACCHS and other community health services to monitor kidney function and immunosuppressive drug levels in remote transplant recipients should be developed and trialled to maximise the value of POCT in the post-transplant context.

It is also critical that future POCT trials and programs establish a system of progressive knowledge transfer and capacity building, so that as a POCT program is implemented, the community is empowered with the resources to manage and sustain the program in the long term. Existing POCT programs that have successfully implemented a sustainable approach have:

- Systematically embedded a functional clinical governance structure for the organisation and accountability of POCT;
- Developed a tailored, continuing program for training and competency assessment of POCT device operators;
- Implemented sustainable quality management practices fit for purpose and relevant and appropriate for the device(s) being used; and
- Documented policies and procedures in flexible formats, depending on the clinical, cultural and geographic settings where community-based POCT is practiced.

It is recommended that a systematic review of well-established Australian POCT models be undertaken to guide the development of a new POCT program that is tailored to cater for the unique needs of remote Indigenous kidney transplant recipients.

**Adopting telenephrology and telepharmacy as models of care for rural and remote Indigenous kidney transplant recipients**

While telenephrology and telepharmacy have been found to deliver effective clinical care for geographically distant dialysis patients, to date there has been no analysis of their impact on transplant-related outcomes, including medication adherence. Consequently, it is proposed that telenephrology and telepharmacy services be trialled among remote Indigenous kidney transplant recipients to determine their efficacy as models of care in the post-transplant context. Key performance indicators should include:

- Patient-centred outcomes, including transport distance, costs, convenience, comfort, and perceived quality of video-conferencing sound and picture, clinician communication, and overall experience;
- Rates of medication nonadherence;
- Rates of post-transplant hospitalisation; and
- Health service cost-benefit analyses.
In addition, it is critical that clinical pharmacy outpatient consults be recognised, endorsed and Medicare funded to ensure equity for patients living in rural and remote communities, and further funding should be allocated to establish and maintain telehealth infrastructure in remote and very remote communities that do not currently have the required setup in place.

**Implementing a remote clinical pharmacist trial**

A remote clinical pharmacist trial could be implemented by supporting pharmacists based in regional hubs to travel to remote community health centres on a part time basis (i.e. 2 days per week) as part of a ‘hub and spoke’ model. Deploying pharmacists on a regular basis to remote communities is expected to facilitate improved awareness and knowledge of transplant related maintenance requirements, specifically immunosuppressive medication adherence, among Indigenous kidney transplant candidates and recipients. To be involved in the trial, pharmacists would need to undertake training in cultural safety and demonstrate a willingness to work collaboratively with ACCHS and Indigenous health workers.

**Enabling transplant centres to provide patients with a CTG annotated script**

Indigenous patients with chronic disease have identified medication affordability as one of the key barriers to adherence. Eligible Indigenous patients living with or at risk of chronic diseases have access to low cost of free PBS medicines through the CTG PBS Co-payment Measure. However, transplant centres are currently unable to provide kidney transplant recipients with CTG annotated prescriptions, as eligible prescribers are limited to:

- Medical practitioners working in a practice that’s participating in the Indigenous Health Incentive under the Practice Incentives Program (PIP);
- Any medical practitioner working in an Indigenous Health Service; and
- Any medical specialist provided the patient is: a) eligible for the measure, and b) referred by a clinician working in a practice participating in the Indigenous Health Incentive under PIP.

Enabling transplant centres to provide patients with CTG PBS prescriptions would have a significant impact on the affordability of post-transplant medications, and thus improve Indigenous transplant recipients’ medication adherence.

**Researching, Developing and Implementing Clinical Guidelines and Protocols**

**Adopting consistent dose administration aid protocols**

DAAs have proven to be a successful adherence support strategy for kidney transplant recipients, and the provision of DAAs is a standard model of care in Australian transplant centres and renal units. However, there isn’t a national DAA protocol for kidney transplant recipients, which can create confusion and reduce adherence for recipients who are required to transition between transplant centres; for example, a patient in the Northern Territory who receives their pre-transplant care in Darwin, has the transplant procedure in Adelaide, and then returns to Darwin for post-transplant monitoring. While dosettes and Webster Paks are similar, their layouts differ slightly. As a result, patients who have been trained to use Webster Paks during their immediate post-transplant care, but are then provided with a dosette upon returning to their home state may end up taking doses at the wrong time of day or skipping doses altogether due to the unfamiliar layout. It is thus recommended that Australian transplant centres and renal units establish a national DAA protocol to ensure all patients receive the same post-transplant care regardless of where they are receiving treatment.
**Trialling novel, long acting immunosuppressive agents**

New immunosuppressive agents are being developed to reduce acute rejection, improve long-term outcomes, minimise nephrotoxicity, reduce infections, cardiovascular, and malignancy-related complications, and promote adherence. Many of these agents, including belatacept, are yet to be trialled in the Australian context. Interventional clinical trials are needed to determine the safety and efficacy of novel, long acting immunosuppressive agents in adult kidney transplant recipients in Australia, particularly Indigenous recipients and those returning to rural and remote communities.

**Box 17: Outline of an interventional clinical trial of belatacept**

**Proposed intervention groups:**

- **Experimental – Belatacept Immunosuppression**
  - Kidney transplant recipients will receive steroids (Methylprednisolone), rATG, Belatacept and Mycophenolate.

- **Active Comparator – Standard Immunosuppression (Tacrolimus)**
  - Kidney transplant recipients will receive standard immunosuppressive therapy, including steroids (Methylprednisolone), rATG, Tacrolimus and Mycophenolate.

**Proposed outcome measures:**

- Graft survival rates
- Number of graft rejection and infective complication episodes
- Renal function (on the basis of eGFR)
- Development of donor-specific antibodies
- Drug tolerability
- Medication adherence
- Rates of reintegration into the home community

**Simplifying existing immunosuppressive regimens**

Past research has found that reducing immunosuppressive dosing frequency for kidney transplant recipients improves their adherence to the treatment regimen and overall quality of life (Obi et al., 2013). One way in which to achieve this is adopting prolonged-release tacrolimus-based regimens in Australian immunosuppressive protocols, as this simplifies patients’ post-transplant care requirements and reduces the likelihood of accidentally missing doses.

**Reducing immunosuppressant drug inefficacy and toxicities in Indigenous patients**

The PK Study is currently exploring genetic targets that may aid the development of tailored immunosuppressive protocols for the Indigenous patient population. Renal units may be able to harness relevant findings from this study to adjust immunosuppressive protocols for Indigenous kidney transplant recipients, reducing immunosuppressant drug inefficacy and toxicities and improving post-transplant outcomes.

**Identifying nationwide antecedents and predictors to severe infective episodes in Indigenous patients**

Nationwide research is required to further explore the post-transplant infection rate disparity between Indigenous and non-Indigenous patients. However, due to the small number of transplants provided to Indigenous recipients, an appropriately powered randomised controlled trial is unlikely to be feasible in many areas. Instead, future research should endeavour to identify key medical, health service and environmental factors that promote or protect against recurrent or severe infective
episodes that may drive the high risk of graft failure post-transplantation. An analysis of jurisdictional and regional differences should also be undertaken to enable renal units across Australia to introduce regionally specific infective prophylaxis protocols.

**Adopting consistent clinical data collection protocols of infective complications**

From a clinical perspective, it is vital that those renal units responsible for providing care to Indigenous transplant patients cooperate to implement consistent clinical data collection protocols of infective complications. This will facilitate evaluation of uptake and effectiveness of prophylactic protocols for viral, bacterial and fungal infections.

**Implementing a tailored prophylactic protocol for Indigenous kidney transplant recipients, based on current evidence**

Currently, no national protocol for infective prophylaxis in Indigenous kidney transplant recipients exists; instead, individual clinical units develop and apply their own protocols. The development of a national protocol has a range of benefits, including: improved consistency of care; enhanced coordination between clinical units and primary care providers, particularly in remote areas; and acknowledgement on a nationwide scale of the importance of tailoring post-transplant care for Indigenous patients. As such, it is recommended that a national working group be established to develop, monitor and evaluate a standardised prophylactic protocol for all Australian renal units.

**Appendix C** outlines recommendation for a prophylactic protocol to prevent infection in Indigenous kidney transplant recipients, covering pretransplant screening, vaccination, antimicrobial prophylaxis and education. The majority of these recommendations draw from and build upon the findings of previous research, while others need to be evaluated as part of clinical trials before broader implementation. For some conditions, regionally specific approaches will need to be implemented to reflect differences in infection prevalence, such as prevalence and causative organisms of invasive fungal infection, gastrointestinal helminth infection, and skin and soft tissue infection.
Summary
This report has outlined the various reasons contributing to Indigenous patients’ under-representation on the kidney transplant waitlist and in receiving a transplant, including:

- The challenges in delivering appropriate health services to people living in remote areas, who might also have low health literacy and not speak English as a first language.
- The greater burden of comorbid illness among Indigenous dialysis patients, leading to fewer patients being deemed medically suitable.
- The shortage of living and deceased donors from within Indigenous communities.
- The length of time on the waiting list and the allocation system based primarily on HLA matching.
- The dislocation that follows from moving to transplant centres in distant capital cities.
- The high complication rate, particularly in terms of early infectious complications, leading to poor transplant outcomes (i.e. higher death and graft loss rates).

The scope of these barriers, covering cultural, social, psychological, biological and genetic areas, makes improving transplant outcomes for Indigenous candidates an incredibly challenging and complex task. There is no easy fix – achieving progress will require a multifaceted approach that targets identified pre- and post-transplant barriers. As outlined in Figure 14, further research, changes to the delivery of health services, and new policies are needed. This will require close collaboration between consumers, research organisations, health services, peak bodies and state, territory and federal governments to enable comprehensive and holistic solutions to be identified and implemented.
Figure 14: Recommendation mapping and consolidated list of recommendations.

<table>
<thead>
<tr>
<th>Establishment of a National Indigenous Kidney Transplantation Taskforce</th>
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<tr>
<td><strong>Commonwealth responsibility</strong></td>
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<tr>
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<th>Consumer engagement &amp; education</th>
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<tr>
<td><strong>State &amp; territory responsibility</strong></td>
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<td>Recommendations: 5, 6, 7</td>
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<td><strong>State &amp; territory // Taskforce responsibility</strong></td>
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<td>Recommendations: 8, 9</td>
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<th>Improving equity &amp; access to transplant services</th>
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<tbody>
<tr>
<td><strong>Commonwealth responsibility</strong></td>
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<td>Recommendations: 16, 18, 21, 22</td>
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<thead>
<tr>
<th>Researching, developing &amp; implementing clinical guidelines &amp; protocols</th>
</tr>
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<tr>
<td><strong>State &amp; territory responsibility</strong></td>
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<td>Recommendations: 23, 27, 28, 31, 32</td>
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<td><strong>State &amp; territory responsibility</strong></td>
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<td><strong>Taskforce responsibility</strong></td>
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<td>Recommendations: 24, 25, 29</td>
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00 Highlight = Priority recommendation
CONSOLIDATED LIST OF RECOMMENDATIONS - Total: 35 recommendations

Highlight = Priority recommendation

Establishment of a National Indigenous Kidney Transplantation Taskforce

1. Establish a resourced National Indigenous Kidney Transplantation Taskforce, with representations from DoH, TSANZ, ANZDATA, ANZSN, OTA and invited subject experts to drive the implementation of the report’s recommendations, consult the Indigenous and health care communities on all relevant initiatives, and advocate for equitable access to transplantation for Indigenous patients.

Data

2. Implement a 12-month pilot project to capture additional pre- and post-kidney transplant data points in an expanded ANZDATA data collection protocol.

3. Incorporate a specific chapter in the ANZDATA annual report on kidney transplantation among Aboriginal and Torres Strait Islander people.

4. Undertake additional data linkage and research projects that target Indigenous patients’ post-transplant outcomes, enabling identification of best practice immunosuppression, infective prophylaxis and vascular complication protocols.

Consumer engagement & education

5. Deliver education programs to Indigenous communities about the value of organ donation and how it links to transplantation, in partnership with local transplant recipients and donor families.

6. Undertake consumer engagement projects that specifically explore Indigenous transplant candidates’ and recipients’ preferred models of care.

7. Establish an Indigenous reference group in every transplant unit to help design pathways and models of care that are culturally appropriate.

8. Trial and evaluate the adoption of patient navigator programs and yarning circles in pre-transplant protocols.

9. Pilot culturally informed transplant education interventions, including remote language centres and culturally tailored immunosuppression adherence education videos.

Improving equity & access to transplant services

10. Evaluate and leverage existing initiatives that target cultural bias in health services to facilitate the rollout of best practice pre-transplant care and support interventions for Indigenous transplant candidates.

11. Ensure Indigenous transplant candidates are connected with primary care services earlier in the ESKD treatment continuum, to enable health issues to be addressed prior to workup.

12. Trial and evaluate weight loss strategies for Indigenous kidney transplant candidates, including conservative, culturally tailored weight loss programs and bariatric surgery.

13. If an empirical evidence base supports the use of bariatric surgery for Indigenous kidney transplant candidates, increase funding for bariatric surgery procedures in public hospitals.

14. Trial a multidisciplinary pre- and post-transplant clinic in one major regional centre for 12 months, prioritising the availability of dental and cardiac services, as well as travel and accommodation support for rural and remote patients.

15. Fund relevant medical and allied health services and positions in regional centres to facilitate the delivery of specialist transplant support outreach services, complementing regional pre- and post-transplant clinics and improving coordination of appointments and services.
Conduct a study on transplant models of care to quantify the costs for rural and remote Indigenous patients to inform the development of a needs-based funding model.

Undertake a systematic review of Australian POCT models to guide the development of a post-transplant care POCT program, comprising new POCT measures that enable the monitoring of renal function and immunosuppressive drug levels in kidney transplant recipients.

Subsidise POCT tests that have been validated by empirical evidence.

Investigate the value of telenephrology and telepharmacy programs for kidney transplant recipients living in rural and regional areas.

Design and implement a remote community pharmacist trial to facilitate improved awareness and knowledge of transplant related maintenance requirements among Indigenous kidney transplant candidates and recipients.

Subsidise clinical pharmacy outpatient consults for Indigenous transplant recipients.

Broaden the list of eligible prescribers for the Closing the Gap (CTG) PBS Co-payment Measure to include transplant centres.

**Researching, developing & implementing clinical guidelines & protocols**

Systematically review the evidence on the outcomes of kidney transplantation with a live donor in the Indigenous patient population to inform health service protocols.

Evaluate the impact of immunological matching at the epitope (epitope) level for allocation of deceased donor kidneys.

Establish a national dose administration aid protocol and a consistent format for drug information.

Implement and evaluate novel, long acting immunosuppressive agents in Indigenous transplant recipients.

Adopt prolonged-release tacrolimus-based regimens in immunosuppressive protocols.

Revise immunosuppressive protocols based on relevant findings from the pharmacokinetic study of immunosuppressives in Indigenous transplant recipients.

Design and undertake research projects to identify the antecedents to infective episodes.

Test and evaluate novel infective prophylaxis interventions for Indigenous transplant recipients.

Adopt coordinated, nationally consistent clinical data collection, analysis and reporting protocols of infective complications across renal units.

Implement a tailored prophylactic protocol for Indigenous transplant recipients.

**Workforce training & development**

Deliver consumer engagement training to renal unit and transplant centre staff.

Implement recruitment and training strategies for the renal workforce, particularly in remote areas, to improve the delivery of culturally appropriate pre-transplant care.

Implement transplant-specific ‘train the trainer’ workshops for Indigenous health workers.
Appendix A  Table of Systemic Biases

<table>
<thead>
<tr>
<th>Systemic Biases and Effect</th>
<th>Mitigating Strategies</th>
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| • Australia’s kidney transplant system has been designed to cater for the needs of non-Indigenous patients.  
  o This promotes inequity in pre- and post-transplant outcomes. | • Processes and systems that support equity in transplant outcomes and organ allocation need to be identified and integrated into renal units and transplant centres.  
  • Possible actions that involve change at the health system, rather than personal, level include:  
    o committing additional funding to Indigenous specific transplant initiatives, such as delivering outreach services in remote areas,  
    o incorporating Indigenous paradigms within service specifications, and  
    o increasing Indigenous representation on advisory boards and steering groups. |
| • A number of criteria used by renal units and transplant centres to determine patients’ suitability for kidney transplantation are standardised across Indigenous and non-Indigenous populations, despite the significant biological, cultural, genetic and social differences that exist between these patient groups.  
  o Applying standardised contraindication criteria to Indigenous patients may not be appropriate and could unjustly limit their access to the waitlist. | • A solid evidence base around criteria to determine transplant suitability needs to be developed and made available to patients and families so that they can understand the rationale underpinning medical decision making.  
  o The evidence base should then be harnessed to determine if certain criteria should include caveats in certain circumstances/individuals. |
| • The higher rates of diabetes and CKD in the Indigenous population may mean that nephrologists adopt a more cautious approach in allowing Indigenous people to donate a kidney to a family member. However, very little is known about how renal unit and transplant centre protocols address this issue, and what evidence has informed the development of these protocols. | • Evidence on the outcomes of kidney transplantation using a live Indigenous donor (for both donor and recipient) needs to be systematically reviewed to inform health service protocols.  
  • The findings of this review should be disseminated to Indigenous transplant candidates and the community more broadly to ensure transparency around decision making processes. |
While the intention is to ensure donors are not put at future risk for ESKD, current donation and transplant protocols may limit the accessibility of kidney transplantation for Indigenous transplant candidates.

- Indigenous ESKD patients are more likely to be overweight or obese compared to non-Indigenous patients, but renal units and transplant centres currently offer very little assistance in helping Indigenous patients to lose weight in order to access a kidney transplant.
  - This limits Indigenous patients’ access to the waitlist.

- Indigenous patients who delay assessment and workup tests due to conflicting family and cultural obligations may be perceived to be nonadherent by renal units and transplant centres.
  - This detrimentally affects Indigenous patients’ likelihood of being waitlisted.

- The health care system needs to accommodate Indigenous patients’ family and cultural obligations by delivering care close to home wherever possible.
  - This necessitates the establishment and funding of multidisciplinary pre- and post-transplant teams and outreach services in regional, rural and remote areas.

- When travel to a renal unit or transplant centre in a regional or metropolitan area is unavoidable, a holistic system of support should be made available to rural and remote Indigenous patients, encompassing accommodation, transport and Indigenous interpreters and patient navigators.

- Issues associated with Indigenous kidney health continue to be insufficiently recognised and prioritised by health care services and governments.
  - Until it is appropriately recognised, inequitable models of care will continue to detrimentally affect Indigenous patients’ pre- and post-transplant outcomes.

- A national agenda to achieve optimal and equitable kidney health for all Australians should be established and supported across all levels of the health care system and government.

- In particular, renal health should be prioritised as part of the Australian Government’s Closing the Gap targets, with
• The extent of inequity in the transplant system is currently difficult to assess, due to a lack of collection and understanding of metrics that identify influencers to pre- and post-transplant outcomes for Indigenous patients.
  o This makes it difficult to pinpoint exactly where the system is failing Indigenous patients, and what antecedents lead to poor pre- and post-transplant outcomes.
• Expand national data collection and reporting processes to enable granular and transparent reporting of key pre- and post-transplant outcomes for Indigenous people.
  o Expanded data collection and reporting needs to be accompanied by an Indigenous data governance framework to support the communication and use of findings within the Indigenous community.

• There are few resources available to engage interpreters and patient navigators in the health care system; in most cases, Indigenous patients who do not speak English as a first language are required to make do with ‘broken English’.
  o This results in frequent misinterpretations, confusion and frustration, ultimately leading to poorer health service engagement and treatment outcomes.
  o The situation is further complicated by transplants often being performed hundreds or thousands of kilometres away from home, limiting the availability of interpreters.
• Equity cannot be achieved without establishing a language competent health workforce who can support timely and quality knowledge exchange with Indigenous patients.
  o This requires increased funding for interpreter and patient navigator roles in renal units, transplant centres and health services more broadly.
  o With improved communication comes improved knowledge, and health care providers must harness the knowledge provided by patients (via interpreters and patient navigators) to incorporate patient preferences into clinical decisions and health action plans.

• Within the nephrology community, a formal, nationally recognised advocacy group should be established to champion equitable access to transplantation and post-transplant outcomes for Indigenous patients.
• Progress monitored and reported on annually.

• Expand national data collection and reporting processes to enable granular and transparent reporting of key pre- and post-transplant outcomes for Indigenous people.
  o Expanded data collection and reporting needs to be accompanied by an Indigenous data governance framework to support the communication and use of findings within the Indigenous community.

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  o With improved communication comes improved knowledge, and health care providers must harness the knowledge provided by patients (via interpreters and patient navigators) to incorporate patient preferences into clinical decisions and health action plans.
Appendix B  Belatacept Trials

Trialling the efficacy of belatacept as a novel addition to Australian immunosuppression protocols is supported by the findings of two phase 3 studies: Belatacept Evaluation of Nephroprotection and Efficacy as First-line Immunosuppression Trial (BENEFIT) and BENEFIT-Extended Criteria Donors Trial (BENEFIT-EXT) (Vincenti et al., 2016).

The BENEFIT trial found belatacept reduced the risk of death or graft loss by 43% at 7 years post-transplant, compared with patients randomly assigned to a CNI known as cyclosporine (Vincenti et al., 2016). Similarly, a post hoc analysis of BENEFIT-EXT data showed a 41% reduction in the risk of death, graft loss or a mean eGFR that was less than 30ml per minute per 1.73m$^2$ 7 years after transplantation among patients randomly assigned to belatacept compared to those assigned to cyclosporine (Vincenti et al., 2016). However, the trials also revealed some cautionary signals; belatacept-treated patients experienced higher acute rejection rates and were at greater risk of developing post-transplant lymphoproliferative disorder (PTLD) (Siddiqui, Tedesco-Silva, & Riella, 2017).

To combat the high rate of rejection, belatacept trial protocols have been adjusted by adding tacrolimus in the first 11 months post-transplant (Siddiqui et al., 2017). A retrospective study using registry data from the Scientific Registry of Transplant Recipients found that of the 875 kidney transplant recipients receiving belatacept in the United States in 2011, around half (n = 417) were on concomitant tacrolimus (Adams et al., 2016). This strategy was associated with lower rejection rates when compared to belatacept alone (Adams et al., 2016). With regard to PTLD, the BENEFIT trial showed that recipients who developed PTLD in the belatacept group were primarily Epstein-Barr virus (EBV) seronegative, and it was posited that a lack of immunity to EBV and potent suppression of T cells by belatacept enabled early EBV infections to manifest unchecked (Vincenti et al., 2012). Subsequently, it has been recommended that belatacept not be administered to patients who are EBV-negative.

**Box 18: Criticisms of the BENEFIT and BENEFIT-EXT Trials**

- The lack of a contemporary control group has been scrutinised, as control patients received cyclosporine, an outdated CNI, rather than tacrolimus that is typically the first choice in current practice (Ekberg et al., 2007).
  - Although the authors suggested that graft survival should not differ among CNIs (Vincenti et al., 2016), a randomised trial comparing the standard dose of cyclosporine with low dose tacrolimus showed that graft survival in the group using tacrolimus was higher than the survival rate of the cyclosporine group (94% vs. 89%, $p = 0.01$) (Ekberg et al., 2007).
  - Furthermore, eGFR was higher in the tacrolimus group than the cyclosporine group, indicating belatacept may not have as great of an advantage over tacrolimus.
- Measurement of long-term patient adherence posed an additional limitation, as this was not assessed beyond month 36 of the 84-month study period (Vincenti et al., 2016).
  - While it was theorised that adherence would differ between the two groups, this is yet to be validated by data.
# Appendix C  Prophylaxis Protocol

## Recommendations for a tailored prophylactic protocol for Indigenous kidney transplant recipients, based on current evidence

<table>
<thead>
<tr>
<th>Pre-transplant screening</th>
<th>1. Undertake standard screening for HIV, HBV (HBsAg, HBeAb, HBsAb), HCV Ab, CMV IgG, EBV IgG, Toxoplasma IgG, HepA IgG, Quantiferon TB GOLD (or equivalent TB Elispot, Mantoux) and HTLV Ab to ensure effective treatment is undertaken, if necessary, prior to transplantation.</th>
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<tr>
<td></td>
<td>2. Test for Melioidosis and Strongyloides serology, and if positive, treat as appropriate.</td>
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<td></td>
<td>3. Screen patients’ stool for parasites (ideally three samples, but at least one), specifically Cryptosporidium.</td>
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<tr>
<td></td>
<td>a) Repeat testing on the transplant waiting list is required if there is ongoing risk of exposure.</td>
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<td></td>
<td>4. Test for scabies, and if present, treat as appropriate.</td>
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<tr>
<th>Pre-transplant vaccination</th>
<th>1. Administer one dose of pneumococcal vaccination with 13v PCV prior to transplantation, followed by 23vPPV 8 weeks later. Repeat 23vPPV at 5 years and finally at 10 years of age 50, whichever is later.</th>
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<tr>
<td></td>
<td>2. Administer Haemophilus influenzae B vaccination single dose, as well as HBV and HAV vaccination if the patient is not immune.</td>
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<td></td>
<td>3. Ensure the patient receives an annual influenza vaccine.</td>
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<td>4. dTPa vaccination if last dose was administered longer than 10 years ago.</td>
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<tr>
<td></td>
<td>5. Administer Varicella (live vaccine), MMR (live vaccine), Zoster (live vaccine), and HPV vaccination according to unit policy. Note – live vaccines are contraindicated in most immunosuppressed patients, and patients should not be immunosuppressed for 1 month after live vaccination.</td>
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<thead>
<tr>
<th>Antimicrobial prophylaxis</th>
<th>1. Administer usual IV antibiotic prophylaxis peritransplant.</th>
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<tr>
<td></td>
<td>2. Administer usual PJP prophylaxis with cotrimoxazole for durations according to unit policy. Consider increasing the dose of cotrimoxazole to double strength (160mg/800mg) one tablet once daily for 1 year to provide better protection against Staphylococcus aureus skin and soft tissue infections (including MRSA).</td>
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<tr>
<td></td>
<td>3. For those with positive melioidosis serology, administer indefinite prophylaxis with cotrimoxazole 160mg/800mg once daily.</td>
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<td></td>
<td>4. Administer usual CMV prophylaxis with valganciclovir.</td>
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</table>

| Education | 1. Develop and deliver culturally appropriate information-sharing processes and resources to ensure Indigenous patients have a comprehensive understanding of post-transplant care and maintenance considerations, including the role good hygiene and nutrition has in staving off infection. |
a) Education about post-transplant requirements must begin in the pre-transplant phase, and be reinforced regularly throughout patients’ time on the waitlist and following transplantation.

2. In order to develop improved education processes and resources, consideration should be given to:
   a) Integrating cultural awareness training and continuous professional development into the non-Indigenous health workforce curriculum; and
   b) Increasing the training, recruitment and utility of Indigenous health workers and interpreters to aid the transmission of medical information and facilitate informed decision-making.

3. Advise Indigenous patients returning to high-risk remote areas without a safe drinking water supply to consume only bottled water.

## Recommendations for novel pre-transplant screening and antimicrobial prophylaxis initiatives for Indigenous kidney transplant recipients, which need to be trialled prior to being incorporated into a tailored prophylactic protocol

### Pre-transplant screening

1. Implement routine comprehensive baseline immunological screening for both Indigenous and non-Indigenous patients to facilitate a direct comparison of the data and improve knowledge of underlying immune deficiencies that may influence post-transplant outcomes.
   a) This data could shed light on how increased exposure and underlying immune deficiencies contribute to the heightened incidence of graft loss and infectious death in Indigenous patients.

### Antimicrobial prophylaxis

1. Administer Amoxycillin 250mg once daily for 1 year for bacterial pneumonia prophylaxis (a reasonable percentage of Streptococcus pneumoniae are cotrimoxazole resistant). If hypersensitive to penicillin, use roxithromycin 150mg once daily.
   a) Data on rates of treatment for bacterial pneumonia among Indigenous kidney transplant recipients should be assessed to determine the efficacy of this approach.

2. Administer Lozanoc (itraconazole) 100mg once daily for 3-6 months to treat antifungal prophylaxis.
   a) Data on rates of treatment for fungal infections among Indigenous kidney transplant recipients should be assessed to determine the efficacy of this approach.
References


Swain, L., & Barclay, L. (2013). They've given me that many tablets, I'm bushed. I don't know where I'm going: Aboriginal and Torres Strait Islander peoples' experiences with medicines. *Aust J Rural Health, 21*(4), 216-219. doi:10.1111/ajr.12053


Appendix 4: Expert Clinician Panel Report for the Kidney Health Australia Caring for Australasians with Renal Impairment (KHA-CARI) Guidelines for the Management of Chronic Kidney Disease among Aboriginal and Torres Strait Islander Peoples
Expert Clinician Panel Consultation Report

Consultation to inform the development of the Inaugural KHA-CARI Guidelines for Management of Chronic Kidney Disease for Aboriginal and Torres Strait Islander Peoples

Cover: ‘My Kidney Journey’ by Inawinytji Williamson
# Table of Contents

Acknowledgements ........................................................................................................... 3  
Abbreviations .................................................................................................................. 4  
Executive Summary and Key Recommendations ............................................................. 5  
A. Background .................................................................................................................. 7  
B. Kidney Health Australia Community Consultation Methodology .................................. 9  
C. Methodology for the Expert Clinician Consultation ..................................................... 10  
D. Chronic Kidney Disease Management Guidelines Used in Current Practice ................. 12  
   1. KHA-CARI Guidelines .............................................................................................. 12  
   2. Kidney Health Australia Chronic Kidney Disease Management in General Practice Handbook ................................................................. 13  
   3. RACGP/NACCHO National Guide to a Preventative Health Assessment for Aboriginal and Torres Strait Islander People ........................................................................... 14  
   5. The HealthPathways Community Care Plans .......................................................... 15  
   6. Local Protocols for CKD Care ................................................................................... 15  
Box 1: Summary of Existing Guidelines for CKD Management ......................................... 16  
E. Barriers to the Use of Guidelines for Managing CKD in Aboriginal and Torres Strait Islander Patients ................................................................. 17  
   1. Patient-related Factors ............................................................................................ 17  
   2. Health Professional-related Factors ......................................................................... 19  
   3. Guideline Factors .................................................................................................... 21  
F. Recommendations to Improve Usefulness and Implementation of Guidelines .............. 23  
   1. Format and Delivery ............................................................................................... 23  
   2. Patient Resources, Education and Engagement of Aboriginal and Torres Strait Islander Patients and Communities ................................................................. 23  
   3. Facilitating Health Care Professional Use and Engagement .................................... 26  
   4. Use of Technology to Support Guidelines ................................................................ 27  
G. Gaps in Existing Knowledge – Strengthening the Evidence-base ................................. 30  
   1. Evidence-base for Workforce Education and Support ............................................. 30  
   2. Evidence-base for Geographical Variation in CKD Risk and Care ......................... 30  
   3. Evidence-base for Patient and Community Education Strategies .......................... 31  
   4. Evidence-base for Prevention Strategies in Aboriginal and Torres Strait Islander peoples ................................................................. 31  
   5. Evidence-base for Managing CKD Stages 1-5 in Aboriginal and Torres Strait Islander peoples ................................................................. 32  
H. Suggested Guidelines Scope and Content .................................................................... 34  
Appendix A: RSA Journal ............................................................................................... 36  
Appendix B: Contributing Health Professionals ............................................................... 41  
Appendix C: Framework of Questions for Discussion: Expert Panel tele/video Conferences .................................................................................................................... 44
Acknowledgements

In 2018, the Minister for Indigenous Health, the Hon. Ken Wyatt AM, MP, commissioned Kidney Health Australia to undertake consultations with Aboriginal and Torres Strait Islander community members around Australia, as well as health experts, service providers and peak bodies to inform the development of the inaugural Kidney Health Australia Caring for Australasians with Renal Impairment (KHA-CARI) Guidelines for the Management of Chronic Kidney Disease among Aboriginal and Torres Strait Islander Peoples.

The authors would like to acknowledge and thank the generous grant awarded by the Government of Australia for the implementation of this consultation process.

The members of the Panel of Expert Clinicians provided expert input and recommendations via video and teleconferences, and written commentary. Kidney Health Australia thank the valuable contribution of the health professionals who donated their time to contribute to this report.

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Joanna Stoic (Executive Support Officer Kidney Health Australia)

Citation:
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>CARPA</td>
<td>Central Australia Rural Practitioners Association</td>
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<tr>
<td>CKD</td>
<td>Chronic kidney disease</td>
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<tr>
<td>ESKD</td>
<td>End-stage kidney disease</td>
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<tr>
<td>KHA-CARI</td>
<td>Kidney Health Australia Caring for Australasians with Renal Impairment Guidelines Group</td>
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<tr>
<td>NACCHO</td>
<td>National Aboriginal Community Controlled Health Organisation</td>
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<tr>
<td>PEAK</td>
<td>Primary Care Education Advisory Committee for Kidney Health Australia</td>
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<tr>
<td>RACGP</td>
<td>Royal Australian College of General Practitioners</td>
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<tr>
<td>RSA</td>
<td>Renal Society of Australasia</td>
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# Executive Summary and Key Recommendations

1. **Comments on Existing Chronic Kidney Disease Management Guidelines**

   1.1. Guidelines are important supports for delivering best-practice clinical care
   1.2. Clinicians commonly use local adaptations of national guidelines, particularly the KHA-CARI evidence-base
   1.3. Existing Guidelines contain varying levels of Aboriginal and Torres Strait Islander-specific content and are of variable relevance to indigenous patients
   1.4. Implementation of chronic kidney disease guidelines are limited by multiple patient, health professional and guideline-related factors that stem from inadequate communication (particularly language and cultural barriers), education and awareness of CKD care

2. **Recommendations to Improve Guideline Usefulness and Implementation**

   2.1. Address the cultural, spiritual and psychological health dimensions of kidney disease for Aboriginal and Torres Strait Islander peoples through direct consultation with communities and patients
   2.2. Support the Guidelines with innovative, culturally safe and appropriate education resources that address language and literacy barriers and are developed in partnership with local patients and community
   2.3. Ensure compact, accessible, easy to use format with simple algorithms for integrated chronic disease care useable by all health professionals
   2.4. Develop Guidelines that are adaptable to local needs and variations, and facilitate individualised patient care
   2.5. Develop and support local Chronic kidney disease champions through culturally appropriate education and training of health professionals and patient leaders
   2.6. Utilise Technology platforms where possible to promote and support Guideline use but remain aware of infrastructure limitations in some indigenous communities

3. **Gaps in Existing Knowledge where the Evidence-base must be Strengthened**

   3.1. Workforce education and support needs and strategies for retention of staff
   3.2. Geographical Variation in Chronic kidney disease risk and models of care
   3.3. Culturally appropriate Patient and Community Education Strategies
   3.4. Strategies for Prevention of Chronic diseases in Aboriginal and Torres Strait Islander peoples
   3.5. Managing CKD Stages 1-5 in Aboriginal and Torres Strait Islander peoples – developing models of care

4. **Suggested Scope and Content of Guidelines**
Guidelines to underpin all aspects of CKD Management for Aboriginal and Torres Strait Islander Cohorts:
4.1. Strategies for culturally appropriate CKD education and support
4.2. Psycho-social and spiritual support for Aboriginal and Torres Strait Islander peoples living with CKD
4.3. Strategies for Health Professional Education and Support of Workforce
4.4. Models of care across all CKD stages

Guidelines for Specific Aspects of CKD Management
4.5. Chronic Disease Prevention in Aboriginal and Torres Strait Islander Populations
4.6. Screening for CKD – recommendations in the Aboriginal and Torres Strait Islander cohort
4.7. Child and maternal health including the first 1000 days of life – reducing the impact on future CKD risk
4.8. Management of Acute Kidney Injury in Aboriginal and Torres Strait Islander peoples
4.9. Management of Pre-dialysis CKD stages
4.10. Management of Transition to End-stage CKD care in Aboriginal and Torres Strait Islander peoples
4.11. Management of ESKD – Dialysis Care and Transplantation

A. Background

Since 1999, Kidney Health Australia and the Australian New Zealand Society of Nephrology (ANZSN) have partnered to fund The Kidney Health Australia-Caring for Australasians with Renal Impairment guidelines group (known as “KHA-CARI”) to produce evidence based clinical
practice guidelines for the management of chronic kidney disease in Australia and New Zealand. More recently, additional funding has been provided via the BEAT-CKD NHRMC project grant.

In 2016, the KHA-CARI Steering Committee prioritised an Indigenous specific guideline in response to a persistent and disproportionate burden of chronic kidney disease (CKD) among Aboriginal and Torres Strait Islander and Maori peoples. KHA-CARI aims to generate a best practice guideline to improve processes and outcomes of care for those Aboriginal and Torres Strait Islander peoples living with kidney disease. In doing so, KHA-CARI identified the importance of partnering with patients and their carers to ensure that any guideline is relevant and meaningful for both patients and clinicians. The engagement of consumers and communities as part of the KHA-CARI clinical guideline development is a new component to the existing methodology. Engagement, consultation and participation of Aboriginal and Torres Strait Islander peoples and communities is very important to ensure the appropriateness, effectiveness, integration and impact on quality of health outcomes.

In 2017, Kidney Health Australia, as the peak consumer organisation, committed to obtain funding for and subsequently undertake a consultation process in Australia to inform the development of new clinical guidelines for the “Management of chronic kidney disease (CKD) among Aboriginal and Torres Strait Islander Peoples” (“The Guidelines”). Complementing the consultation to be conducted by Kidney Health Australia, the “Catching Some Air” project team led by the Lowitja Institute committed to undertake these consultations in the Northern Territory, and a separate consultation process is being undertaken in Aotearoa New Zealand with respect to Maori and Pacific Islander peoples.

In 2018, the Hon Ken Wyatt MP, Federal Minister for Indigenous Health, awarded a grant to Kidney Health Australia to undertake consultations with Aboriginal and Torres Strait Islander community members around Australia (except Northern Territory sites covered by Catching Some Air project), as well as health experts, service providers and peak bodies to ensure the new guideline is aligned with community preferences.
Goals for the Consultations

- Seek feedback and advice on the focus and content of new clinical guidelines and the priorities for clinical care.

- Seek feedback and advice on how best to translate the new clinical guidelines into culturally safe consumer information, tools and educational materials that will support implementation into efficient clinical practice.
B. Kidney Health Australia Community Consultation Methodology

The consultation is designed to be wide and encompassing to facilitate maximum input from the people who are most likely to use and be affected by the use of the planned Guidelines. The consultation is intended to focus on what is relevant to the planned Guidelines.

The consultation is designed to complement and recognise the decades of activities by many others across Australia in the area of Indigenous Kidney Health research and community engagement.

Over-arching principles for consultation are outlined in detail in Appendix A (D Duff, S Jesudason, M Howell and JT Hughes. A partnership approach to engage Aboriginal and Torres Strait Islander peoples with clinical guideline development for chronic kidney disease. Renal Society of Australasia (RSA) journal 2018; 14 (3): 84-88). As outlined in this joint statement on methodology, the consultation findings will complement the Catching Some Air project and align with the KHA-CARI Guidelines development principles.

The consultation involves the following strategies:

**Strategy 1**
- Consultation with a panel of health practitioners who are experienced and expert in “on-the-ground” clinical renal health care delivery to Aboriginal and Torres Strait Islander peoples.

**Strategy 2**
- Targeted site engagements with locally-based Aboriginal and Torres Strait Islander consumers and community members and service providers.

**Strategy 3**
- Consultation and feedback from national peak organisations who are working in the area of kidney health.

The details of these consultations are outlined in appendix A.

This report outlines the outcomes from consultations for Strategy 1.
C. Methodology for the Expert Clinician Consultation

WHY: The purpose of this consultation was to have broad, multi-disciplinary input, feedback and engagement from health practitioners “at the coal face” of primary, secondary and tertiary renal care.

The health professionals who are utilising existing mainstream or Aboriginal and Torres Strait Islander guidelines in actual practice are best placed to advise the KHA-CARI Guidelines Writing Group on practical and tangible recommendations guidelines development for Aboriginal and Torres Strait Islander peoples.

This expert clinician consultation will complement the community consultation with indigenous people and peak bodies (strategies 2 and 3).

WHO: Kidney Health Australia identified expert, community-based health practitioners from metropolitan, rural and remote regions, who were actively involved in clinical care delivery for kidney disease. Also, primary health care professionals in all states and territories were invited to participate. The panel members were encouraged to identify other professionals in their jurisdictions or elsewhere in Australia who they felt should be engaged in this activity. All additional health professionals suggested by panel members were invited to participate. Some invited health professionals were unable to personally participate and therefore nominated a proxy or alternate delegate. Additional health professionals provided input into the draft report, which was distributed widely for consultation. In the writing of this report Kidney Health Australia has reported the stated views of the panel contributors, which may not be the views of all contributors or clinicians. A broad range of views have been represented. All participants in the consultation process for this report are listed in Appendix B.

HOW: The consultation process occurred between June–December 2018. The framework of questions for this consultation (Appendix C) was developed by A/Prof Shilpa Jesudason (KHA), Dr Martin Howell (KHA-CARI) and Dr Jaquelyn Hughes (KHA-CARI Writing Group Co-Chair). Panel members volunteered their time for tele/video conferences (co-chaired by Associate Professor Shilpa Jesudason, Kidney Health Australia, and Dr Martin Howell, KHA-CARI) or direct discussions with A/Professor Shilpa Jesudason and Ms Dora Oliva or via written commentary on the draft report. Tele/video conferences were recorded and transcribed by Kidney Health Australia Staff, Ms Karen Barfoot and Ms Joanna Stoic, and key concepts and recommendations were collated for this report.
<table>
<thead>
<tr>
<th>Contribution of the Members of the Expert Panel of Clinicians</th>
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<tbody>
<tr>
<td>Advise on the use of existing mainstream and/or Aboriginal and Torres Strait Islander clinical guidelines, barriers/facilitators of use and gaps in care.</td>
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<tr>
<td>Advise on the scope, content and structure of the proposed guidelines.</td>
</tr>
<tr>
<td>Advise on best practice for implementation of clinical guidelines and translation into practice.</td>
</tr>
<tr>
<td>Feedback on a draft of this report.</td>
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<tr>
<td>Assist in identifying sites, local leads or contacts for Strategies 2 and 3 of this consultation.</td>
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D. Chronic Kidney Disease Management Guidelines Used in Current Practice

The panel identified several resources that were utilised regularly in clinical care of Indigenous patients with CKD across Australia.

The main focus of existing guidelines was early detection of CKD and management of early stage CKD for primary care services, with minimal content on pre-dialysis and end-stage kidney disease management.

NB: This describe resources highlighted specifically by the expert panel and is not a summary of every resource used in Australia.

1. KHA-CARI Guidelines
www.cari.org.au

The KHA-CARI Guidelines are not indigenous-specific and cover topics related to:
- Chronic Kidney Disease
- Dialysis
- Transplantation

The KHA-CARI Guidelines background and Guidelines Writing process is described in detail on their website. Access to the Guidelines is free. The website has over 1000 unique visitors per month (KHA-CARI Annual Report 2017).

Awareness: Awareness of the KHA-CARI Guidelines was high among nephrologists, but other health professionals felt there was less awareness of these guidelines by non-nephrologists. The KHA-CARI guidelines provide a valuable base for practice but are less known in the primary care community caring for indigenous patients. The lack of indigenous-specific content was felt to reduce awareness among health professionals engaged in care of Aboriginal and Torres Strait Islander patients. In 2009, KHA-CARI produced guidelines for Diagnosis, Prevention and Management of Chronic Kidney Disease in Type 2 Diabetes in conjunction with the Diabetes Australia Guideline Development Consortium, however Aboriginal and Torres Strait Islander cohorts were not specifically addressed.

Barriers to Awareness and Use: The panel acknowledged that these evidence-based guidelines were very important and should underpin recommendations for care of Aboriginal and Torres Strait Islander patients. However, it was noted that often evidence-based guidelines published in journals or on websites are not necessarily referred to by all healthcare professionals. Guidelines that are in hardcopy format in clinics were more likely to be utilised.
Those that were aware of the KHA-CARI guidelines considered them very academic and perceive them to be information for specialist clinicians and “not routinely used in the field”. It was acknowledged that a more “useable” format is desired by health professionals.

The lack of consumer versions of the guidelines enabling patients to understand the management of their disease was raised. The recent production of consumer versions of guidelines by KHA-CARI was welcomed as an important initiative.

2. Kidney Health Australia Chronic Kidney Disease Management in General Practice handbook (the ‘Handbook’)

The Chronic Kidney Disease (CKD) Management in General Practice handbook is in its 3rd edition and a 4th edition will be released in 2019. Content of the Handbook is determined by the multidisciplinary Primary Care Education Advisory Committee for Kidney Health Australia (PEAK). The content is derived from the evidence-based recommendations from the KHA-CARI Guideline on “Early chronic kidney disease: Detection, Prevention and Management” (Johnson DW, 2013), as well as current literature and expert opinion. The Handbook provides summarised advice on detection and management of early CKD (to stage 3a/b). Kidney Health Australia has surveyed users of the Handbook who indicated the resource is well utilised within general practice including nurses. It is the highest downloaded resource from the Kidney Health Australia website. The App version of the Handbook (the CKD-Go App) is one of the most utilised medical Apps in Australia.

Awareness: The Handbook was noted by the panel to be a widely used resource in Indigenous Primary care. It was considered to be a practical and accessible document, used widely “out in the field” due to its easy-to-use style and hard copy format. Key information is quick to locate. The CKD staging poster and colour-coded action plans (based on the Handbook) are considered a very useful quick reference guide by general practitioners, especially regarding when to refer to a nephrologist. Apunipima Cape York Health Council promotes the Kidney Health Australia Handbook to general practitioners including locums in North Queensland and remote areas. The Handbook was utilised by medical, nursing and allied health staff, as it was simple to read and use.

Barriers to Awareness and Use: Overall, an expansion of indigenous-specific content was strongly recommended. The panel had varied comments on Indigenous-specific content within the handbook, ranging from “lacking” to “good”. The Handbook lacked of recognition
of cultural, spiritual and psychological health dimensions of kidney disease, which is particularly relevant to indigenous patients (but also to all patients).

To address this gap, organisations in some regions of Australia have drawn on KHA-CARI guidelines and the Handbook to develop local protocols and/or manuals that fit with local conditions and practice (see below).

3. RACGP / NACCHO National Guide to a Preventative Health Assessment for Aboriginal and Torres Strait Islander peoples


The Royal Australian College of General Practitioners (RACGP) together with the National Aboriginal Community Controlled Health Organisation (NACCHO) have developed the National Guide to a preventive health assessment for Aboriginal and Torres Strait Islander peoples, now in its third edition. This broad-ranging, practical resource for primary care management includes a brief, evidence-based chapter on key recommendations for CKD management, aligned with the RACGP Red Book (Guidelines for preventive activities in general practice), Kidney Health Australia Handbook and KHA-CARI Guidelines. The RACGP and NACCHO promote these guidelines, and in 2018-19 have undertaken a review of implementation strategies to facilitate integration into clinical practice and better care.

Awareness and Use: Some health service representatives were unaware of this national guide, while others knew of it but indicated it was not used locally. In some areas, the national guideline is adapted to suit local settings and requirements, with many working locally on how to best deliver care. The kidney-specific chapter is very brief and key recommendations are contained within other guidelines and resources including the Kidney Health Australia Handbook.


This manual of protocols on a very wide range of acute and chronic conditions was developed by the Central Australia Rural Practitioners Association (CARPA) and Centre for Remote Health, Flinders University. It was described by the panel as driven by GPs, informed by specialists, and is very specific to the Northern Territory (NT) catchment area and remote clinicians who may lack specific relevant training. The manual’s section on CKD utilises information from the Kidney Health Australia Handbook and KHA-CARI Guidelines.
Awareness and Use: The CARPA manual is widely known and used in the NT, and some areas of WA and SA, and particularly in remote areas. Outside of the NT it remains well known in many jurisdictions along with other Remote Primary Health Care Manuals. Some panel members reported that due to the number of health conditions within the book, requests to increase CKD content to include specific kidney health issues have been declined. However, the eGFR study on the rate of progression is included. Expanding the Indigenous content within the handbook to include specific issues related to Indigenous health or developing a separate handbook would be advantageous.

The main resource used in the NT and many other remote regions are CARPA and related manuals. Importantly, their use is enshrined in legislation, in that nurses and Aboriginal Health Practitioners can only supply medications according to CARPA guidelines – any deviation from these guidelines requires medical input.

While the material on renal diseases is limited, general practitioners are expected to go beyond CARPA and remote Primary Health Care manuals when making decisions. This is where the KHA-CARI Guidelines would be most useful - not in replacing CARPA but going beyond CARPA to advise on complex management issues in renal disease.

5. The HealthPathways Community Care Plans
www.healthpathwayscommunity.org

HealthPathways is an initiative led by Primary Health Networks (PHN) in conjunction with Local Health District (LHD) and Local Health Networks (LHN) across Australia and in other countries. Via an online portal, HealthPathways is providing general practitioners and other health professionals with easy access to comprehensive, evidence-based assessment, management and localised referral resources, for approximately 500 specific health conditions. Adaptation of HealthPathways content for specific jurisdictions occurs through collaboration of primary and specialist services, to develop models of care suited to the local context.

Awareness and Use: The Web-based nature of HealthPathways enables these to be easily maintained, updated and accessed, although access requires pre-registration and is not open. Online-only access is not always useful in some remote areas. There is substantial variation between jurisdictions with respect to the development of CKD-specific pathways, and they are not comprehensive. Overtime, the importance of these guidelines is likely to increase in guiding clinical practice at a local level, addressing resources, availabilities and needs.

6. Local Protocols for CKD care:

Several panel members reported that their local jurisdictions had developed their own protocols or guidelines for care of Aboriginal and Torres Strait Islander patients with CKD. Awareness and use of these resources are largely limited to those jurisdictions. Local/regional adaptations were considered more useful than the KHA-CARI guidelines or other resources.
because they are a better fit with local practices and conditions, and therefore more used by the primary care health workforce (GPs, nurses, healthcare workers).

For example, The Kimberley Aboriginal Medical Services (KAMS) and WA Country Health Service (WACHS) have developed multiple protocols including one for CKD, which is used like their ‘bible’ and follows the Kidney Health Australia Handbook and KDIGO Guidelines closely, but adapted for Kimberley populations. These adaptations incorporate local epidemiology (screening) and referral pathways affected by limited visiting services, time, and distances.


This has a large section on CKD management drawn from the KHA-CARI Guidelines and Kidney Health Australia Handbook with minimal adaptation for Aboriginal and Torres Strait Islander patients.

**Box 1: Summary of Existing Guidelines for CKD Management:**

There is substantial variation across Australia with respect to CKD guideline use although the Kidney Health Australia CKD Management Handbook appears to be widely used in indigenous primary care. A pyramid effect is noted, with evidence-based national guidelines (KHA-CARI content) as the base although they have minimal indigenous-specific content. While these are directly used infrequently, they are interpreted and adapted for use in other national resources (Kidney Health Australia Handbook, RACGP Guidelines, HealthPathways) and as regional/local resources (CARPA manual, KAMS CKD protocol and Apunipima chronic conditions manual).
E. Barriers to the use of guidelines for managing CKD in Aboriginal and Torres Strait Islander patients

The panel highlighted a range of issues that, in their experience, had influenced the ability to implement guidelines in Indigenous chronic disease care. The panel reflected that many of these concepts had been raised over many years by multiple groups, however tangible action had been slow in many areas.

1. Patient-related factors

Awareness of Early Stage CKD:

- The panel agreed that getting the concept of ‘early stage kidney disease’ across to Aboriginal and Torres Strait Islander patients is vital in managing the progression of kidney disease as promoted in CKD guidelines.

- Achieving early diagnosis of CKD (at stage 1-2) is a significant issue within the Indigenous community. Often patients only become aware of their kidneys or seek help when they reach CKD stage 3 or beyond.

- Awareness about primary and secondary prevention of kidney disease is low within the primary health care workforce and among kidney patients. Efforts to raise awareness of earlier stage CKD in Aboriginal Medical Services can be frustrated by healthcare workers’ perception that “they don’t die of Stages 1 or 2 [of CKD] so why discuss it”.

- In addition, competing health priorities may lead to early stage CKD being de-prioritised, even when other priorities are co-morbidities such as diabetes, which can lead to CKD.

Fear of Kidney Disease:

- At present there is little understanding among the broader health professional community regarding the psycho-social and spiritual support needs of Aboriginal and Torres Strait Islander peoples living with CKD. This should be a Guidelines priority.

- Health professionals may minimise early stages of chronic kidney disease.

- Guideline usefulness is hampered by the difficulties faced by health professionals when trying to educate patients to understand the importance of looking after their kidneys, without causing fear.
Health professionals may minimise the severity of kidney disease in order to engage patients e.g. “you just got a little bit of kidney trouble” or “Your kidneys aren’t quite 100%”.

The word ‘Disease’ always implies end-stage kidney disease even when used to describe early CKD stages. A diagnosis of kidney disease leads to a pessimism among patients, irrespective of CKD stage. This is a major barrier to strategies targeted at earlier stage CKD.

Dialysis is almost always the main treatment that patients mentally associate with kidney disease at any stage, and this impedes focus on earlier preventative measures.

Important messages can be lost or distorted when the patient feels the doctor is not taking a holistic approach or when the patient is “blindsided” by a health assessment which reveals a multitude of health issues.

Patients may be overwhelmed when they attend health consultations for a specific problems or issue, but the subsequent comprehensive health assessment reveals many more problems.

**Inadequate Communication of Guideline Recommendations to Patients:**

- The western approach is to develop guidelines based on evidence and apply these consistently to all persons. This approach is not culturally aware or respectful, and may cause harm to patients or disengage patients from their health care.

- The terminology used within the guidelines is often not suitable for translation to Aboriginal and Torres Strait Islander peoples. For example, routine eGFR reporting has assisted in providing a language framework to use when explaining kidney disease but this is not useful in all patients due to language and understanding barriers.

- The benefits of chronic disease treatment are not always explained or are explained in broad terms that have little tangible meaning. This is particularly relevant for asymptomatic disease states.

- Inadequate communication is a central root cause of perceived patient non-adherence, and perpetuate unfair judgement of Indigenous patients by health care providers.

- Aboriginal people respond better to intergenerational learning. Their knowledge is obtained through first-hand (family/personal) experiences. Addressing the care needs of indigenous patients without inclusion of family and support persons can limit the success of the interaction, and may lead to lack of understanding about why certain treatments or interventions are recommended. Decision-making often requires further family and community involvement.
Biological Variations:

- The panel did not strongly feel there were significant biological variations between Indigenous and non-indigenous patients that would preclude the utility of general CKD guidelines. A lack of research with Indigenous groups to explore biological variability was noted.

- Transplantation (especially tissue typing and organ matching) was one area where biological variation is likely to exist and this should be addressed in any Guidelines related to transplantation care.

- The treatment pathways for early stage kidney disease were thought to be the same for all patients.

- There was some consideration that disease progress may be more aggressive in Aboriginal and Torres Strait Islander peoples especially for diabetic kidney disease.

- There is no clear evidence on variation in drug metabolism for Indigenous patients, but it was noted that research is occurring especially with immunosuppressive agents.

Demographic and Logistical Issues:

- Substantial logistic issues were identified that might impede best-practice clinical care and these should be considered when planning guidelines implementation.

- Geographical disparity and travel burden were considered major issues limiting access to care. New initiatives to support dialysis care in geographically remote areas were welcomed as potential facilitators of better early-stage CKD care, but the model is yet to be fully tested and does not address regions that are less than very remote, which is where the bulk of the population resides.

- Health professionals noted there is a real “battle” between an individual’s desire to seek health care and desire to remain within community. Patients are constantly forced into making this choice to the detriment of their health.

- There are also important socioeconomic burdens for Aboriginal people, and it was noted these have been outlined in the Renal Road Map developed by Minister for Indigenous Health, the Hon. Ken Wyatt AM, MP. Renal care should be approached in a holistic manner but it was acknowledged these Guidelines cannot address all relevant social and demographic issues that impact on kidney care.

2. Health Professional-related Factors

Health Professional Communication:
• Inadequate training regarding culturally appropriate communication with Aboriginal and Torres Strait Islander patients can lead to difficulty in implementing guideline recommendations due to patient disengagement and frustration on both sides.

• Health professionals may not have time or capacity to undertake extensive patient education. This is particularly important for asymptomatic conditions that require drug therapy (for example hypertension, proteinuria).

• Language barriers are also a source of frustration for health professionals. Health professionals may not have the ability to access interpreters or utilise them appropriately or repeatedly.

• It is particularly worrisome that specialists often describe Primary Health Care in negative terms. It is an issue as it contributes to the view that the Primary Health Care sector, and in particular the Aboriginal Community Controlled Health Service sector, is failing. This needs to be addressed in these guidelines and in ongoing work.

*Applying Guidelines to Individual Patients:*

• Guidelines should facilitate the contextualisation of evidence-based medicine but are often too prescriptive.

• While guidelines may outline best-practice care, the limitations of guidelines application should be acknowledged – particularly for the indigenous cohort and setting.

• Clinicians want and expect to exercise their clinical judgment when treating the patient “in front of them”, and therefore guidelines that are rigid were unhelpful and less likely to be followed.

• A disconnect between guideline recommendations and what actually occurs in practice was noted.

*Competing Pressures on Health Professionals for Chronic Disease Care:*

• The panel emphasised that health professionals have many competing diseases to address, time-pressures and lack of resources compared with demand which are all major barriers within the primary and secondary care space.

• Health professionals may be overwhelmed by the range of chronic diseases to address, therefore streamlining guideline recommendations was recommended.

• Kidney health should be part of a holistic management consultation for diabetes, cardiovascular disease and other chronic disease (see below).
Even though the “competing” chronic diseases are linked with kidney disease, the panel noted some health professionals do not see prevention of kidney disease as a top priority, as patients “do not die of stages 1-2 CKD”.

Best-practice recommendations around disease prevention, or slowing progression (for example, blood pressure targets), were considered harder to implement than recommendations for acute management of active disease (for example referral to tertiary services for end-stage CKD care).

3. Guideline factors

Integration of Chronic Disease Guidelines:

- Cohesive guidelines that incorporate other conditions that share risk factors and treatments, particularly diabetes, hypertension and cardiovascular disease, was strongly encouraged by the panel.

- Guidelines that exist in disease “silos” or “divide the body” were less useful.

- The usefulness of diabetes / hypertension / cardiovascular disease / infection guidelines would be enhanced by consistent inclusion of information about the identification and treatment of kidney disease within those disease states.

- Mainstream services find it challenging to read multiple disease-specific guidelines and keep up to date with new developments. Over time, overarching standards and guidelines should be developed on chronic diseases that share risk factors, which can be adapted locally and be referred to in disease-specific guidelines.

Format of Guidelines:

- Complexity, academic language, and difficulty of access were considered barriers to guidelines use.

- Rigorous synthesis of the evidence base in the format of the KHA-CARI guidelines was considered essential and unavoidable, however translation of this into easy-to-follow recommendations did not always occur.

- PDF documents and large folders were less useful than smaller handbooks that could be carried easily by health professionals in daily practice or located quickly.

Awareness of guidelines among health professionals – promotion and training:

- Guidelines were not always actively promoted to key health professionals “on the ground” – this was particularly noted for national guidelines.

- Health professionals involved in care of Aboriginal and Torres Strait Islander patients may not always receive education regarding how best to use guidelines in daily practice.
Therefore, guidelines are developed and distributed, but in the absence of strategies and training for implementation, they are not followed.

- Guidelines were not always promoted to all levels of staff within health services, and could be considered something only doctors or experts used. Educating non-medical health practitioners about guidelines can improve uptake and embedding into practice.

**Consumer Engagement in Guidelines Development:**

- Guidelines are often developed without input from the patients and consumers most affected. The enhanced consumer involvement at KHA-CARI was welcomed.

- In the absence of appropriate and meaningful consumer engagement and consultation the Guidelines are likely to be poorly utilised.
F. Recommendations to Improve Usefulness and Implementation of Guidelines

The panel discussed a range of aspects to consider for developing useful CKD guidelines, including the format and delivery, accessibility, consumer engagement, healthcare professional engagement and technology. The panel was asked to consider approaches that had been successful and unsuccessful in their experience.

1. Format and Delivery

- The format and delivery will likely determine the success of the CKD guidelines.
- A compact, easy to use version of the guidelines to improve accessibility (without compromising the evidence base) will allow for greater utilisation “in the field”.
- Guidelines should be more economical in length, and offer health practitioners simplified treatment algorithms for CKD care integrated with other chronic disease conditions. This will create a more functional guideline for better utilisation and success.
- A unified document for chronic disease care will avoid confusion for health practitioners about where to find information and how to apply guideline recommendations for common risk factors for CKD, cardiovascular disease and diabetes.

2. Patient Resources, Education and Engagement of Aboriginal and Torres Strait Islander Patients and Communities

- It was considered essential to translate the guidelines into culturally and linguistically appropriate information for patients to help them navigate the CKD care process, understand the healthcare professional’s message, and communicate their wishes and decisions to the doctor.
- Supporting patient empowerment through provision of kidney health knowledge and facilitating appropriate questions regarding their treatment should be underpinned by resources to assist patients, their families and communities to become more informed and engaged in their CKD care.

Educational Frameworks and Resources:
• Consumers (patients, carers and community) should be involved to address language, cultural and educational issues and ensure the guideline recommendations are implemented in the ‘real-world’.

• Strengthening and evaluating the evidence-base regarding translation of guidelines content to consumers was highlighted as a key priority. Educational resources must have an evidence base demonstrating evaluation and successful use in Aboriginal and Torres Strait Islander cohorts.

• Aboriginal Educational Philosophy should be considered for all educational resources accompanying the guidelines. The '8 [Aboriginal] Ways of Learning' framework (Regional Aboriginal Education Team, Western area 2012, 8 ways: Aboriginal pedagogy from Western NSW, RAET, Dept. of Education and Communities, Dubbo, N.S.W) has been widely utilised in Aboriginal education and provides a structure of teaching that is culturally competent, reflecting key processes (summary fact sheet https://www.painaustralia.org.au/static/uploads/files/8-aboriginal-ways-of-learning-factsheet2-wfklwmnralub.pdf). Non-verbal approaches, story-telling, pictorial learning maps, use of symbolism and connection with community are key aspects of “8 Ways” to incorporate.

• “Learning from each other” is a common form of learning for Aboriginal and Torres Strait Islander peoples by sharing of stories. The value of narrative (story-telling) as means of communication and learning was considered particularly important, particularly when it comes from someone who has kidney disease (see below re: patient preceptors).

• Information in the guidelines should be accessible to patients (written format, video, translated into languages). A multifaceted approach should occur to ensure the information is suited to varied settings – for example different communities, primary care settings, and hospital settings.

• While this is complex, different levels of health literacy should be catered for, with “layers” of information ranging from simple to more complex depending on the patient needs.

• Language barriers should be actively addressed, with a focus on trained interpreters and translated material. Local community input will assist this (see below).

• Novel / innovative means of communication with patients about kidney disease and kidney care should be developed. These may include:
  o Visually-based materials as useful adjuncts to written material. For example, the visual aid “Feltman®” is commonly used for teaching Indigenous Australians about diabetes management and the prevention of type 2 diabetes, and was emphasised as a well-evaluated and widely used tool for discussions about disease that could potentially be adapted to kidney disease.
  o Video content (with translations, animations).
o Conversation cards to facilitate questions and enable health workers to identify key points for education and discuss common misconceptions.

o Fact sheets and consumer versions of guidelines (as already prepared for recent KHA-CARI guidelines).

o Decision-support tools specific to the needs of Aboriginal and Torres Strait Islander patients and their extended family / community, developed and evaluated in conjunction with consumers

**Family support:**

- This was considered highly valuable in-patient education. A family centred care approach to healthcare is more impactful and successful.

- Family members at appointments can assist patients in the decision-making process. Inclusion of extended family is essential, as they are often involved in the care of patients. Although time-consuming, this process should be facilitated by health professionals. Cultural responsibilities have an impact on the ability to engage in health care.

- The KHA-CARI guidelines group should ensure the guidelines are supported by educational information for patients and their family members.

**Patient Preceptors:**

- The model of care practiced by The Purple House ([www.purplehouse.org.au](http://www.purplehouse.org.au)) was cited by panel members as an example of patient preceptorship aiding implementation of clinical practice recommendations and leading to improved health outcomes.

- The preceptors (patient navigators) were effective in providing support to other patients, and new clinicians and health workers working with Indigenous patients and communities. Within the NT, the preceptor role has evolved in to a paid position.

- The preceptor role strongly complements the roles of liaison officer, health worker, nurse, and nephrologist. They provide input on cultural safe care and aspects of delivering appropriate education within the context of the local community, addressing language and cultural barriers.

- In addition, preceptors can serve as local champions for kidney disease awareness.

- Survival on dialysis in Central Australia is the highest in Australia even accounting for younger age of onset of kidney disease. This is surprising given the poverty and difficult life circumstances in this region. Effective primary health care, social and cultural support along with increasing opportunities for either permanent or respite dialysis on country are likely to be factors in this positive outcome, along with the high standard of dialysis services.
Community Reference and Governance Groups:

- Ongoing local Community input and engagement (patient and health professional) was identified as a key facilitator of uptake of guidelines.

- Continued culturally appropriate communication to inform the community and demonstrate how the implementation of the guidelines is benefiting them is an important component of implementation of any practice change. Gaining support and engagement from the community will enable follow up and feedback to assess progress of implementation.

- Local Community Reference Groups also can advise healthcare professionals about cultural and other local factors that would enhance doctor-patient communication and health outcomes for patients with CKD, and ensure adaptations of the guidelines are relevant to the community.

- Engagement of State-wide renal and Aboriginal Health networks, Aboriginal leadership and governance groups, Aboriginal Community Controlled Health Organisations and Aboriginal Medical Services, and other governing bodies will also facilitate guideline adaptation and more coordinated implementation.

3. Facilitating Health Care Professional Use and Engagement

Individualised and Adapted Care:

- Guidelines should assist practitioners to make decisions, but leave room to individualise care based on circumstance and clinical skills. The ability to vary and adapt guidelines to individual or community context was viewed as highly important.

- Regional and local variations of the guidelines will ensure use within specific areas and demographic groups.

- Guidelines are useful when organically developed by the group they are intended for. An example is the CARPA Standards Manual which was driven by general practitioners. They are used widely and routinely with the NT areas for which it was specifically developed, and is also used by some regions of WA and SA.

Coordination of Chronic Disease Care:

- The Guidelines Writing Group should develop a multisystem approach by reviewing the evidence base across cardiovascular, diabetes, and kidney disease, to identify the common approaches in addressing these chronic diseases. For example, the next edition of the Kidney Health Australia Handbook will address diabetes, cardiovascular disease and CKD cohesively, in keeping with frameworks developed by the National
Chronic Disease Prevention Alliance and other groups supporting integrated health reviews.

- At every possible point, the impact of CKD on other chronic diseases (and vice versa) should be highlighted and integrated into algorithms for care of Aboriginal and Torres Strait Islander patients.

**Promotion of guidelines – Local Clinical Champions:**

- It was noted that once developed, guidelines are not consistently promoted to health care professionals, particularly in areas of high staff turnover. Some local jurisdictions achieve awareness of guidelines more successfully but usually when there is a strong local clinical lead or champion for kidney disease.

- Local Community input and engagement (patient and health professional) was identified as a key facilitator of uptake of guidelines. The establishment and support of local clinical champions was considered an important aspect of guideline promotion and regular use.

- For example, the Kidney Health Australia Primary Care initiative “Kidney Health Australia CKD Ambassador Program” [https://kidney.org.au/ckd-ambassador](https://kidney.org.au/ckd-ambassador) is designed to help practices become CKD Ambassador amongst their peers and patients, through supported implementation of the recommendations of the Kidney Health Australia Handbook. This program also facilitates measurement of impact of practice change through a “do and review” process. Although this new program is in a pilot phase and has not been developed specifically for indigenous health centres, it may develop as potential model for supporting local health professional CKD champions.

**Promotion of Guidelines – Health Professional Education and Support and Workforce**

- Resources should be provided to train health professionals to optimally use the guidelines, including a cultural safety module. This is particularly important for health services that are not experienced in indigenous care, but may see indigenous patients on occasion.

- Aboriginal Health workers should have specific training relevant to kidney disease (and chronic disease) and these Guidelines.

- There is great variation in how local Aboriginal Medical Services and Community Controlled Health Services function. Therefore, standards of care and clear pathways for guidelines implementation are recommended, and should be actively promoted.

- Aboriginal Health professional clinical care workforce issues will need to be addressed in the longer-term. High staff turnover in many indigenous health services, lack of trained and qualified local health staff and resource constraints are identified as
potential limitations to be addressed. Clinicians suggested that Aboriginal Health professional clinical care workforce is an important priority to move forward.

4. Use of Technology to Support Guidelines

**Access to Technology and Digital Platforms for Guidelines Content:**

- Technological advance was identified as a both a key enabler and potential barrier for successful guideline use.

- Thoughtful use of technology to support accessibility for both health practitioners and patients to culturally safe information and resources should be a key priority.

- Guidelines must be available in multiple formats to facilitate access e.g. hard copy, downloadable PDF, web-based, and within an application (“app”) for smart phones / tablets.

- It was important to note that many health professionals have paper-based clinical practice, and access to contemporary clinical practice technology is not always available. Security firewalls and protections within clinics may restrict downloading from “external” websites.

- Internet access is not universal – some areas of Australia and some remote health services have limited or no access. Power may also be inconsistently available on occasion. Therefore, access to guidelines in hard copy remains important for use in indigenous communities.

- Patients face a similar situation and, additionally, may not be able to afford to download a health resource due to data costs. These issues apply to those living in metropolitan areas as well as those in regional and remote parts of Australia.

**Digital Content – Applications (“Apps”):**

- Utilisation of technology requires user-friendly guidelines applications providing quick reference tools to all the information required for CKD management.

- Kidney Health Australia has the “My Kidneys, My Health” App for patients and the “CKD-Go” App for health professionals. While these Apps assist with navigation to external links hosted on the Kidney Health Australia website, access can be difficult in the absence of an internet connection. Therefore, it was suggested that for any future Apps containing CKD management guidelines, all of the content should be imbedded within Apps rather via external links, and updated regularly through notifications via the App.
• An App for the KHA-CARI guidelines would be welcomed, if content was specifically developed in a user-friendly format, with links to hard version of the full evidence-base that clinicians could access if required.

**Medical Practice Software:**

• Embedding links to guidelines in medical practice software is another potential avenue for facilitating implementation. This may be limited by the wide range of software used in practices.

**Tele-health:**

• Telehealth assumes that there is robust internet connectivity.

• Telemedicine was recognised as a potentially under-utilised means to support clinical guidelines implementation. It is also a mechanism to support “two-way education”.

• One successful model of care for Indigenous patients within a transplant clinic in Victoria has been a collaborative approach via a consultation between clinician, patient, Aboriginal co-opts, and other health care team (as required), via Telehealth. Working via the local healthcare provider has proven to be more successful than infrequent clinician site visits, and far more effective than letters to general practitioner or bringing the patient to metropolitan centres. Patient satisfaction with this model of care is high.

• Successful implementation of guidelines via telehealth consultations requires local staff to be engaged and to highlight successes and barriers (language, internet, mobile phone services).
G. Gaps in Existing Knowledge – Strengthening the Evidence-base

The panel suggested areas where evaluation of the evidence-base would be useful for incorporation into the proposed guidelines and where further research is urgently required.

1. Evidence-base for Workforce Education and Support

- The primary and secondary care workforce are critical to preventing and managing CKD.
  - Aboriginal and Torres Strait Islander peoples often bypass primary care and enter directly into tertiary nephrology services with advanced CKD or ESKD due to failure to implement early CKD detection guidelines in primary care.
  - Knowledge and implementation of CKD guidelines is often limited for overseas-trained or recently arrived staff, or areas of high staff turnover and transient staff populations.
  - Lack of continuity of clinical care due to staff turnover undermines guidelines implementation.
  - Staff involved in CKD care may lack culturally appropriate communication skills training.

- Understanding the challenges facing the primary and secondary care workforce in regional and remote areas will be an important step in addressing the lack of awareness about early kidney checks and prevention of CKD progression, and implementing guidelines for CKD management:
  - Strategies to improve workforce capacity and staff retention are urgently required.
  - New guidelines must be accompanied by improved workforce capability through culturally appropriate education and resources. These should address early stage CKD management to improve detection rates and minimise “crash landing” to tertiary care.
  - In addition, there needs to be better education for local health professionals involved in the care of patients receiving renal replacement therapy (all modalities) and renal supportive care, to facilitate care in community and minimise evacuation / transfer.

2. Evidence-base for Geographical Variation in CKD Risk and Care

- The relationship between CKD risk and geographical location has been demonstrated (Kidney Health Australia 2016 State of the nation Report 2016).
• CKD Management Guidelines do not currently detail geographical variations in risk, and do not incorporate remoteness or other geographical parameters into clinical care algorithms.

• Biology may be the similar across cohorts but population risks and sociodemographic factors may differ, and therefore guidelines should address the geographical variation.

• The evidence-base demonstrating benefit of earlier and more aggressive screening and intervention for CKD in certain areas with the highest risk of patients developing end stage disease should be expanded.

3. Evidence-base for Patient and Community Education Strategies

• Current guidelines on CKD management do not address evidence-based strategies for culturally appropriate patient education and patient-doctor communication to facilitate CKD care. This represents a significant gap in the guidelines and barrier to implementation of care recommendations.

• The evidence-base determining barriers and facilitators of health-related culturally appropriate communication and education in Aboriginal and Torres Strait Islander cohorts has grown in recent years and should be synthesised. There are several specific projects that address this and these should be drawn upon in the proposed guidelines. For example, The Northern Territory Renal Services Integration Project and Menzies School of Health Research have had a large range of projects addressing how best to engage Indigenous people in primary care and kidney care, and barriers and enablers of indigenous engagement with health systems.

• Suitable, validated, nationally available education resources about prevention and CKD are lacking. Many regions have developed their own resources and methods of education, and successful initiatives should be identified and evaluated in other cohorts.

• Developing culturally appropriate education resources in multiple media formats (video, pictures) that facilitate translation into appropriate languages and health literacy levels is an urgent priority.

• The role of patient preceptors and models of care through peer-support should be further explored and evaluated.

4. Evidence-base for Prevention Strategies in Aboriginal and Torres Strait Islander peoples

• Fear of kidney disease diagnosis is a major barrier to preventative interventions in primary care.
• Further research is required into the best strategies for implementing disease prevention pathways without disengaging patients and communities due to fear and/or lack of understanding of illness.

• The evidence-base for community based and culturally appropriate education interventions for preventative health measures should be reviewed and successful strategies identified that may be utilised in CKD care. In particular evidence around improving diet quality, addressing obesity and cessation of smoking.

5. Evidence-base for Managing CKD Stages 1-5 in Aboriginal and Torres Strait Islander peoples

• Early stage CKD is often poorly managed, with many Indigenous people starting dialysis completely unaware that they have had kidney disease for years. Many patients fail to receive an Adult Health Check that may have identified their uncontrolled diabetes and kidney disease. Strategies for improved uptake of health checks in Primary care should be reviewed.

• Late referral to nephrology services remains a problem for a subgroup of patients and further work is required to understand the barriers to timely referral.

• Primary health care teams are crucial partners in CKD early detection and care, and the evidence-base is reasonably well-established. However, there is a distinct lack of structure for management of later stage CKD and transition to ESKD care in regional and remote communities.

• Further research should address the role of primary care and community health organisations in supporting later-stage CKD care for Aboriginal and Torres Strait Islander peoples, including pre-dialysis care, decision-making regarding renal replacement therapy options, dialysis care, pre-transplant referral and workup, and post-transplant care.

• Models of care where community, primary and tertiary renal care services are integrated should be explored.

• There is substantial practice and published evidence about successful models of care in this setting. An overview of Aboriginal renal services in Primary Health Care found that nurse-led services with strong Aboriginal workforce and community ownership were the most successful model (Reilly et al., 2016). Danila Dilba has implemented a successful multidisciplinary renal unit that has been evaluated and shown to significantly delay need for dialysis (Menzies School of Health Research, 2019). Other services such as Central Australian Aboriginal Congress have also strong programs in this area. A literature review about these successful models of care in the Northern Territory, and the work in the chronic care area by the South Australian Health and Medical Research Institute (SAHMRI) and Menzies School of Health Research during the past 15 years of collaboration that evaluates models of care in the Indigenous space was recommended.
Establishing a coping mechanism for transition to dialysis is a real challenge for Indigenous patients and the health professionals engaged in their care. The evidence-base for spiritual and psychological counselling and addressing the grieving process for the loss of kidney function and transition to ESKD is very limited for Indigenous and non-indigenous cohorts. This is an area where further knowledge is urgently required.
H. Suggested Guidelines Scope and Content

The expert clinician consultation has led to the following recommendations for topics to be included or considered for inclusion in the proposed Guidelines.

Guidelines to underpin all aspects of CKD Management for Aboriginal and Torres Strait Islander Cohorts:

1. Strategies for CKD education and support including
   a. Patient education strategies
   b. Community approaches and engagement strategies
   c. Models of patient support – peer-to-peer support systems

2. Psycho-social and spiritual support for Aboriginal and Torres Strait Islander living with CKD including Management of grief associated with kidney disease

3. Strategies for Health Professional Education and Support of Workforce including
   a. Promotion of Guidelines and local adaptation
   b. Recommendations for culturally-safe communication with patients
   c. Strategies for workforce training
   d. Strategies for workforce retention
   e. Telemedicine in CKD Care

4. Models of care for Aboriginal and Torres Strait Islander peoples across all CKD stages
   a. Integrated models of care
   b. Role of primary care services in supporting advanced CKD and ESKD
   c. Multidisciplinary care models

Guidelines for Specific Aspects of CKD Management

5. Chronic Disease Prevention in Aboriginal and Torres Strait Islander Populations
   a. Diet including salt
   b. Smoking
   c. Obesity management
   d. Exercise
   e. Blood pressure
   f. Other primary prevention measures

6. Screening for CKD – recommendations in the Aboriginal and Torres Strait Islander cohort

7. Child and maternal health including the first 1000 days of life – reducing the impact on future CKD risk
8. Management of Acute Kidney Injury in Aboriginal and Torres Strait Islander peoples
   a. Relationship to future CKD risk
   b. Recommendations for prevention, management, and follow up

9. Management of Pre-dialysis CKD stages
   a. Blood-pressure, lipid and diabetes management (and medical therapies)
   b. Strategies for self-management
   c. Models of care in the community (integrated care with renal services)
   d. Referral recommendations

10. Management of Transition to End-stage CKD care in Aboriginal and Torres Strait Islander people
    a. Psychosocial care and cultural needs
    b. Culturally appropriate communication, education and engagement of family and community
    c. Dialysis Modality – treatment choices
    d. Vascular access – timing, type

11. Management of ESKD – Dialysis Care and Transplantation
    a. Remote dialysis models of care
    b. Management of relocation, separation from community
    c. Addressing barriers and facilitators of treatment attendance
    d. Referral for transplantation
    e. Infection management

12. Management of end-of-life care with ESKD
    a. Cultural and community aspects
    b. Renal Supportive care
Appendix A
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A partnership approach to engage Aboriginal and Torres Strait Islander peoples with clinical guideline development for chronic kidney disease

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Abstract
The Kidney Health Australia — Caring for Australians with Renal Impairment (KHA-CAR) Guidelines aim to develop an inaugural clinical guideline for the “Management of Chronic Kidney Disease (CKD) among Aboriginal and Torres Strait Islander People and Māori”. In this article we highlight why this clinical guideline is needed at this time, and the pertinent history of Australian and New Zealand nephrology clinical guidelines development. We describe the strategies that will be used in Australia to ensure the guideline is underpinned by recommendations identified from within the Aboriginal and Torres Strait Islander community, and which supports clinician need.

Three engagement strategies for the Australia consultation are outlined: 1) Engaging a panel of Aboriginal and Torres Strait Islander health clinicians; 2) Targeted site engagements, with formal evaluation, with locally based Aboriginal and Torres Strait Islander consumers and services; and 3) Consultation and feedback from the Australian national peak organisations. A separate community consultation strategy is to be implemented in New Zealand.

These consumer and community consultation strategies will precede and inform the KHA-CAR guideline technical writing team. The technical writing group includes medical, nursing, and primary health care members, and also members who are Aboriginal and Torres Strait Islander and Māori. The diverse technical writing team members will ensure that the guideline will be clinically appropriate, effective and meaningful. Such guidelines, relevant to the needs of the community, are necessary to support health services to deliver quality health outcomes for patients and families living with chronic kidney disease.

Keywords
CKD, Indigenous Australians, guidelines, health services.

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Introduction
Clinical guidelines are written to inform best practice health care. Guidelines are a strategic way to align clinical practice with best practice standards and have a purpose in identifying the resources required to maintain best practice standards. Clinical guidelines can be used to evaluate clinical outcomes, and thus performance of health services. Best practice can be referenced to both clinical and health care user perspectives (Miller et al., 2017). Creation of best practice clinical guidelines are a critical part of the broader strategies to minimise Australia’s burden of kidney disease among Aboriginal and Torres Strait Islander peoples (KHA, 2013).

We outline the strategies underpinning the development and writing of the inaugural bi-national guideline for the Management of Chronic Kidney Disease in Aboriginal and Torres Strait Islander peoples and Mibob. In this manuscript, we detail the Australian consultation strategies. A program specific for consultation with Mibob communities is to be undertaken separately and is not described here.

First we present key data about chronic kidney disease (CKD) among Aboriginal and Torres Strait Islander people.

What we know about CKD among Aboriginal and Torres Strait Islander people

- Nationally almost one in five people live with indicators of CKD (albuminuria or low eGFR) but most (50%) are unaware of this (ABS, 2014).

- Albuminuria is a powerful and early predictor of rapid decline in kidney function (eGFR) (Howell et al., 2017; Maple-Brown et al., 2016).

- There is geographic variation in the burden of CKD which affects a higher proportion of people living in remote Australia (ABS, 2014).

- Aboriginal and Torres Strait Islander people with end-stage kidney disease (ESKD) are more likely to commence haemodialysis treatment (ANZDATA, 2017) and have lower access to kidney transplantation than non-Indigenous patients (Lawton et al., 2017).

- Advancing Aboriginal and Torres Strait Islander kidney health is a priority for governments, clinicians, patient advocacy groups and Indigenous Australians. Improving health requires culturally competent care and a willingness to partner (Hughes et al., 2016; KHA, 2015; NMBA, 2018; RACP, 2003).

- The development of a best-practice set of guidelines for use by the nephrology community for the management of CKD among Aboriginal and Torres Strait Islander peoples will support the key recommendations for education, prevention, early detection and management, and workforce education, arising from the 2015 Policy Round Table and Parliamentary Meeting which was hosted by Kidney Health Australia (KHA, 2015).

KHA-CARI Guidelines Group
The Kidney Health Australia — Caring for Australians with Renal Impairment (KHA-CARI) Guidelines Group is currently funded by Kidney Health Australia (KHA), the Australian and New Zealand Society of Nephrology (ANZSN) and BEAT-CKD (an NHMRC-funded program). KHA-CARI is managed by a steering committee, and since 1999, the KHA-CARI Guidelines Group has produced evidence-based clinical practice guidelines for the Australian and New Zealand region.

Guideline convenors are experts who volunteer their time after selection by the KHA-CARI Steering Committee. The guideline convenor leads a technical writing group. KHA-CARI supports the technical writing group members with a secretariat, provides training in evidence rating, and provides the systematic review of the evidence to support the technical writing group. The KHA-CARI guideline process follows a best practice approach for the development of reliable and trustworthy clinical practice guidelines (see Guideline Development Manual at www.cari.org.au). Following this approach, KHA-CARI guidelines embed best available published evidence into a framework for standard clinical care which benefits the health care user. KHA-CARI guidelines therefore have an important role in supporting high quality health care and clinical outcomes for patients with kidney disease in Australia and New Zealand.

The majority of KHA-CARI guidelines have been disease- or treatment-specific, and have been delivered by the technical writing group with little external consultation. However, KHA-CARI has recently established a program for partnering with patients and their carers to ensure that guidelines are relevant and meaningful to both patients and clinicians. Two recent examples of the consultation process are the Autosomal Dominant Polycystic Kidney Disease and Infectious Diseases clinical practice guidelines (Miller et al., 2017; Tong et al., 2012; Tong et al., 2016). Partnering with consumers is a priority identified by the Australian Commission on the Safety and Quality of Health Care (ACSQHC, 2010), and provides a powerful opportunity to ensure guidelines are relevant and meaningful for both health care users and the health care clinical community. Effective partnering also increases community awareness, which supports effective translation of best clinical evidence into health care.
KHA-CARI Guideline for the Management of Chronic Kidney Disease in Aboriginal and Torres Strait Islander Peoples and Māori

The KHA-CARI Steering Committee prioritised this population-specific guideline in response to a persisting and disproportionate burden of advanced kidney disease among Aboriginal and Torres Strait Islander peoples and Māori (ANZDATA Registry, 2017). Two Australian convenors (one is Torres Strait Islander) and two New Zealand convenors (one is Māori) were appointed. The guidelines technical writing group has also been appointed, comprising Australian and New Zealand members (and which includes Aboriginal and Torres Strait Islander and Māori members). For the first time in KHA-CARI history, this guideline will be preceded by community consultation.

Australian Guideline engagement strategies

In Australia, the engagement will comprise three strategies within a targeted, respectful and consultative process with Aboriginal and Torres Strait Islander peoples living with kidney disease. There are two goals of the community consultation:

1. To seek feedback and advice on the focus and content of new clinical guidelines, specifically the priorities for clinical care.
2. To determine the appropriate methods for translation of the new clinical guidelines into consumer information, tools and education materials. This will support a meaningful and relevant guideline, which can be meaningfully implemented into clinical practice.

Strategy 1: Engaging a panel of Aboriginal and Torres Strait Islander health clinicians

The Aboriginal and Torres Strait Islander health clinician panel will comprise community-based practitioners (indigenous or non-indigenous) at the interface of patient care. This panel will be well placed to advise on issues with the utilisation of existing clinical guidelines, gaps and considerations for implementation within a variety of settings and with complex conditions. The panel will be multidisciplinary and representative of jurisdictions with a high prevalence of CKD, whilst including perspectives from metropolitan, regional, rural and remote settings.

We recognise the potential for overlapping perspectives from the Aboriginal and Torres Strait Islander kidney health workforce. This might include the ‘on the ground’ health clinicians who are also Aboriginal or Torres Strait Islander people (Strategy 1), who may be involved in this panel.

but who might also represent an ‘on the ground’ clinician who is providing patient care for a peak body (Strategy 3) or government-funded renal service (Strategy 3), whilst also serving on community governance boards, and/or operating in a family-care role for someone living with kidney disease (Strategy 2). Individual Strategy 1 panel members will also facilitate and assist with strategy 2, the targeted site engagements with Aboriginal and Torres Strait Islander consumers and services.

Strategy 2: Targeted site engagements with locally based Aboriginal and Torres Strait Islander consumers and services

The targeted site engagements are anticipated to occur in 15 sites across Australia, involving five states and the Northern Territory, and require 18 months to two years. The proposed community engagement sites will also be aligned to: 1) the location of dialysis centres with high numbers of Aboriginal and Torres Strait Islander people, and 2) those sites which have Aboriginal community-controlled health organisations with staff actively working in kidney health, or staff engaged in managing CKD risk factors.

Strategy 2 seeks to value participation and minimise the burden on communities, which was a priority regurgitated by plenary speaker, Professor Carle Bourassa, at the 6th Annual NHMRC-Lowitja Institute Research Translation Symposium (Bourassa, 2017). The KHA-CARI consultation will be initially delivered in Darwin, Alice Springs, and Thursday Island in 2018 by the Catching Some Air project (funded by the Lowitja Institute), and led by a team from Menzies School of Health Research (Catching Some Air, 2018). This local team is ideally placed given their long-standing community relationships and proven track record in Aboriginal and Torres Strait Islander community engagement, capacity building and working with reappointee. Subsequent consultation at other sites will be coordinated by Q-A using local partners. The consultation methodology will likely evolve after each consultation and will be adaptable rather than iterative. Therefore, with secured funding, a developed methodology and an evaluation team, we will ensure the consultation process occurs, is documented, evaluated and gives relevance, ownership and control of information to Aboriginal and Torres Strait Islander local communities.

Strategy 3: Consultation and feedback from the Australian national peak organisations

Strategy 3 includes engaging with members of Australian national peak health organisations who are working in kidney health on the ground. These peak organisations and affiliates include, but are not limited to, the Australian Indigenous Doctors Association, The Congress of Aboriginal and Torres Strait Islander Nurses and Midwives, Indigenous Allied Health...
Feasibility and risk management

Several challenges are anticipated. The first challenge is delivering a coordinated consumer engagement process (Strategy 2) across Australia, which may feed into the clinical guideline writing phase in an acceptable time frame. Therefore, commencing the writing process has been strategically deferred to allow sufficient time for consultation and feedback with each of the Aboriginal and Torres Strait Islander health services and sites.

Delivering consultation on this scale is a further challenge, but precedent is being set; KHA partnered with the Murdoch School of Health Research and the ANZSN to host the Indigenous Patient Voices — Gathering Perspectives, Finding Solutions to Chronic and End Stage Kidney Disease Symposium, in September 2017 (Hughes et al., 2018). This Symposium provided a vital rehearsal to Strategy 2 — meeting logistics, identifying the most appropriate meeting facilitator, patient and carer support (some who traveled from interstate), budget requirements and learning from over 30 patients and carers who clearly articulated their priorities for care. These knowledge-sharing meetings where engage with renal patients must include consideration of ethics, immunisation and intellectual property.

A key priority is to secure adequate funding for the remaining Strategy 2 engagement sites. Potential sources of funding include traditional research funding streams, discretionary government funding and philanthropic sources. On October 25th, 2018, the Hon Ken Wyatt AM MP Minister for Indigenous Health announced a $300,000 grant to Kidney Health Australia over 2 years, to deliver the Aboriginal and Torres Strait Islander culturally appropriate consultation process that seeks to meet the needs of our community. The subsequent guidelines will complement the Minister’s national renal roadmap which is currently under development.

Working together with trust for community advancement through better health

Research and clinical guidelines and understanding community priorities for better health are not isolated activities. It is envisaged that the community consultation for these guidelines will have substantial added value for renal care of Aboriginal and Torres Strait Islander patients. These are not invited to bringing together, for the first time, a national Aboriginal and Torres Strait Islander renal consumer voice, with potential to maintain into the future. This is a key priority for KHA who will coordinate and maintain the community voice links, and will also inform advocacy for Aboriginal and Torres Strait Islander renal health across many organisations.

Respecting the distinctiveness of First Nations peoples through guidelines development

The guideline consultation will respect the distinctiveness between Aboriginal and Torres Strait Islander people living with kidney disease who have varying contexts and values regarding health. Following the community consultation period, the recommendations for guidelines development from Australia and New Zealand will converge. Respect for the distinctiveness of Aboriginal, Torres Strait Islander and Māori communities will be framed at all levels of the guidelines development from inclusion of both Aboriginal and Torres Strait Islander and Māori leaders in the design and delivery of the community consultation, visiting both Aboriginal and Torres Strait Islander and Māori communities; and valuing the contribution of peak organisations who reference the needs of both Aboriginal and Torres Strait Islander and Māori people living with kidney disease. In addition, the technical writing group has actively sought inclusion of Indigenous Australian and New Zealand and Māori members.

Delivering health care framed around population-specific need

We emphasise the value of the guidelines writing process for advocating and delivering health framed around population-specific need. Given the opportunity, the health caring community who were present at the Indigenous Patient Voices Symposium, looked patients and carers in the eye, learned the impact of their illness and made an appropriate response. Patients’ feedback included a pervasive and persisting experiences of care in the delivery of kidney health services, a desire for more holistic care and services to be more available close to home (Hughes et al., 2018). We are delighted the 2018 Australian Federal Government Budget has outlined a new Medicare Benefits Schedule item number for assisted dialysis in very remote Australia. This health care system transformation was directly linked to the strong collaboration of health care users (who had the opportunity to identify their most important priorities for care), and a kidney health caring community committed to health advancement. This consumer engagement method demonstrates the desire and willingness of many Aboriginal and Torres Strait Islander people to provide feedback in order to support the necessary health care transformation (Hughes et al., 2018) and, more importantly, the willingness and ability to achieve health care change where these are given voice.
Engaging our mob in CKD clinical guidelines development

Conclusion
It is an expectation that people of Australia and New Zealand benefit from high-quality health care. Clinical guidelines are a strategic way to align clinical practice with best practice standards. In order to support healthy communities, Australia and New Zealand are well positioned to achieve kidney health advancement for Aboriginal and Torres Strait Islander and Māori communities through delivery of this guidance based on effective engagement. There is strong clinical and community desire to achieve kidney health advancement for Aboriginal and Torres Strait Islander Peoples through guideline development, notwithstanding the significant challenges around funding and logistics of such an unprecedented scale of consultation across Australia and New Zealand. Success in this initiative will have far-reaching importance and will embed the Indigenous patient voice into clinical kidney care, policy and service delivery — for the betterment of all.

Acknowledgements
The work has been presented in abstract form at the 6th Annual NHMRC-LwTJA Institute Research Translation Symposium. DD led and designed the engagement strategy in her role as Manager of Indigenous Programs at Kidney Health Australia in 2017. DD and JH are investigators of the Catching Some Air: Asserting Aboriginal and Torres Strait Islander Information Rights in Renal Disease” project. JH is supported by NHMRC fellowship #1092576, and is an Australian co-convenor of the technical writing group for the KIJA-CARI Guideline for the Management of Chronic Kidney Disease in Aboriginal and Torres Strait Islander Peoples and Māori. MH is overseeing the community engagement process for the KIJA-CARI guideline office and is supported by BEAT-CKD and NHMRC Program Grant (#1092657).

References
## Appendix B

### Contributing Health Professionals

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<td>Name</td>
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## Appendix C

### Framework of Questions for Discussion: Expert Panel tele/video conferences

<table>
<thead>
<tr>
<th>TOPIC</th>
<th>CONSIDER THESE ISSUES</th>
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<tbody>
<tr>
<td><strong>Usefulness of Existing CKD Guidelines</strong></td>
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<tr>
<td>1. Which guidelines / evidence bases are routinely used in practice?</td>
<td>Local, Kidney Health Australia CKD Handbook, KHA-CARI, International (KDIGO), Cochrane Awareness of these Guidelines Barriers to Awareness</td>
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<td>2. Are these guidelines useful in ABORIGINAL AND TORRES STRAIT ISLANDER cohorts?</td>
<td>Biological factors Cultural issues Social / demographic factors Gaps in the guideline topics</td>
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<td>3. What are the key barriers to guideline usefulness?</td>
<td>Consumer factors Health Care Professional Health service factors Guideline Factors</td>
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<td>4. What would make guidelines more useful?</td>
<td>Format and delivery Accessibility Consumer engagement Health Care professional engagement Resources Technology</td>
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<tr>
<td><strong>Gaps in Care</strong></td>
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<td>1. Which gaps in care need to be addressed most urgently?</td>
<td>Prevention Strategies Early Detection Prevention of progression Comorbidities Pre-dialysis care</td>
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<td>2. What is the best way to address these?</td>
<td>Transition to End-stage Consumer education Health professional Education</td>
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<td>3. What has been successful in your experience?</td>
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<tr>
<td>TOPIC</td>
<td>CONSIDER THESE ISSUES</td>
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<tr>
<td><strong>CKD Guidelines Scope and Content</strong></td>
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</table>
| 1. What should be included in these Guidelines? | As for Gaps in Care  
Also consider:  
Consumer involvement  
Delivery of education to consumers / communities  
Delivery of Education to Health professionals |
| 2. How should the content be prioritised? |  |
| 3. What should be left out? |  |
| **Strategies for Implementation** |  |
| 4. How should these Guidelines be implemented? | Education and dissemination  
Peer-peer mentoring  
Technology support  
Resourcing  
Community engagement  
Stakeholder engagement |
| 5. What has previously been successful? |  |
| 6. What has been unsuccessful? |  |
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Disclaimer

The recommendations contained in this report were formed from feedback obtained through consultation with expert, community-based health practitioners from metropolitan, rural and remote regions, who were actively involved in clinical care delivery for kidney disease, and primary health care professionals. It is designed to provide information and assist decision-making. The authors assume no responsibility for personal or other injury, loss or damage that may result from the information in this publication.
Appendix 5: Catching Some Air - Asserting Indigenous Information Rights in Renal Disease
Catching Some AIR
Asserting Aboriginal and Torres Strait Islander Information Rights in Renal Disease

A targeted policy brief to

“Close the Gap in Aboriginal and Torres Strait Islander diabetes and kidney health”
In the spirit of respect, Menzies School of Health Research acknowledges the people and elders of the Aboriginal and Torres Strait Islander nations who are the traditional owners of the land and seas of Australia.

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This document is currently in confidence with intended recipients, Hon Minister Wyatt AM MP, and Hon Warren Snowden. The authors intend to publish the policy brief as a record of activities within the Catching Some Air project which aims to advance the health of Aboriginal and Torres Strait Islander peoples who live with sustained and devastating impact of diabetes and chronic kidney disease.
Section 1: Executive Summary
We momentarily pause, take a breath (‘catch some air’), reflect, plan and advocate for targeted
action to improve kidney health for Aboriginal and Torres Strait Islander peoples in northern
and central Australia.

The Indigenous-led CATCHING SOME AIR (C-AIR) project team have comprehensive
expertise spanning culture and community, community development, health promotion,
Indigenous training, primary and tertiary health care, research, evaluation and policy.
Informed by an intensive 12-month community-consultation, we present strategic multi-level
activities which require sustainable implementation for diabetes and kidney health
advancement. This policy brief was invited by Hon Ken Wyatt AM MP, Minister for Indigenous
Health and invited by Hon Warren Snowden, Member for Lingiari following targeted feedback
led by Dr Jaqui Hughes to these parliamentarians on November 29th 2018.

Aboriginal and Torres Strait Islander diabetes and kidney disease- devastating
yet preventable

Diabetes and chronic kidney disease (CKD) occur more frequently and at younger ages
among Aboriginal and Torres Strait Islander people compared to non-Indigenous Australians1.
Undiagnosed and poorly controlled diabetes and progressive CKD contribute to excess
hospital care for Aboriginal and Torres Strait Islander people, and have devastating impacts
on individuals, families, communities and economies. Early clinical markers of diabetes and
CKD often co-exist with overweight, cardiovascular disease risk markers2 and chronic
infections3-5 and inflammation6, and low socio-economic status7, 8. Episodes of chronic
infection9 and acute infection with sepsis10 may contribute to acute kidney injury and explain
rapidly progressive CKD and dialysis initiation11. Improving communication about kidney
health and health treatments is a high priority identified by health care providers and Aboriginal
and Torres Strait Islander health care users and communities12-15.

In Darwin, Thursday Island and Alice Springs, the C-AIR project invited community members
with lived-experiences of diabetes and CKD to recommend best practice for kidney health in
relation to 1) clinical care and 2) the collection and use of kidney health data12, 13, 15. The
consultation meetings have confirmed that data and clinical care are powerfully linked, yet
Aboriginal and Torres Strait Islander peoples have been excluded from processes which
determine health action priorities, modalities and models of service delivery, decision-making
processes and accountability for policy decisions. This feedback is consistent with advice
obtained at the 2017 Indigenous Patients Voices Symposium 16.

Consultation approach and key recommendations

A consultation process led by Aboriginal and Torres Strait Islander people engaged with
patients living with diabetes and kidney disease, carers and family members. The consultation
articulated the urgent and unmet need for a community-level focus on prevention/health
education, early intervention and brief interventions.

A new paradigm involving a broader investment is required across the continuum of care in
primary, secondary and tertiary health care for our mob at risk of kidney disease. The new
paradigm must encompass community-identified priorities for Aboriginal and Torres Strait
Islander diabetes and kidney health in regional and remote Australia, and acknowledge the
complex matrix of stakeholders.
**Investment Required**

We believe action is needed now to close the gap in renal health. This requires urgent and targeted investment including:

1) Fund activities to identify and map the cross-sector silos which impact Aboriginal and Torres Strait Islander renal health in North and Central Australia. Define

2) Agree on a set of measurable key performance indicators targeting close the Gap in Aboriginal and Torres Strait Islander renal health. and a financial investment to collect, monitor and evaluate health outcomes

3) We ask for financial investment and commitment to implement, evaluate and upscale a multi-disciplinary community-based Indigenous kidney health workforce servicing rural and remote communities

**Our Commitment**

We invite a strategic partnership at the Federal level to engage us to progress the business case aligned to the required investment with stakeholders (State and Territory governments, local government, community controlled health sector, higher education and vocational education and training institutions, research institutes, and health services and other relevant stakeholders).

**Policy Challenges (risks)**

To address and resolve renal disease within Aboriginal and Torres Strait Islander communities is challenging in its own right. During our consultation and preparation for this policy brief, a number of pertinent issues and concerns (referred now as challenges) were identified (List 1). These challenges cannot be addressed in isolation of the broader context to *Close the Gap* in Aboriginal and Torres Strait Islander renal health. The challenges require urgent attention, either alone or collectively.

List 1. Challenges in Closing the Gap in Aboriginal and Torres Strait Islander renal health

1. Silos
2. Funding
3. Changes in government policy at all levels of government
4. Shifting sign posts
5. Lack of specific renal health targets and performance indicators
6. Leadership
7. Racism
8. Poverty
9. Transparency
10. Support for Indigenous workforce
11. Readiness of community
12. Training and support to sustain succession planning and Indigenous workforce
13. Data, monitoring and evaluation systems
14. Lack of treaty
15. Indigenous ownership of renal current and future directions
16. Reciprocity of shared priority agenda
17. Urban vs Rural Vs Remote Aboriginal and Torres Strait Islander communities
18. Cross Cultural knowledge sharing
19. Other factors

**Action Outcomes**
We have identified the three most urgent key priorities (investment required) and the policy recommendations (items). We anticipate some of the above challenges can be addressed and incorporated within the investment required and the policy recommendations.

**Policy Items (recommendations)**
The key policy recommendations (Items) are referenced to Aboriginal and Torres Strait Islander community-informed and expressed priorities for best practice for health, in particular for diabetes and kidney health. The issue, impact, proposed solution and potential funding requirements are discussed for each item.

- Coordinated and economically sustainable strategies to address renal health across all levels of government
- Meaningful knowledge sharing for the Aboriginal and Torres Strait Renal Patient Community
- Preventative Health Care
- Sustainable Workforce
Section 2: Policy Items
Item 1: Coordinated and economically sustainable strategies to address renal health across all levels of government

The Issue
Lack of coordination of policy and planning of urban, rural and remote renal health services have adverse effects on the health and wellbeing of renal patients, their carers/families and the wider community. Renal health services planning has been heavily weighted towards a centralised service model which has been necessary to meet the needs of end stage kidney disease, with insufficient engagement of renal patients in the design, development and implementation of these services.

The Impact
The absence of strategic policy to address issues associated with renal prevention/health promotion has been detrimental to Aboriginal and Torres Strait Islander communities. The present renal service planning model detracts from the community-defined and mandated priority of simultaneously delivering health maintenance and preventive health care.

The Proposed Solution
The greatest health impact requires coordination and integration of health services and programs that work cohesively and accountably toward closing the renal health gap within thirty years. Guided by agreed key performance indicators for optimal kidney health, a consortium of cross-sector agencies must be identified to collaborate with renal patients and carers. These agencies include Federal, State, Territory, Local government, Aboriginal Medical Services, Private and Public Renal Services. Collective and integrated solutions should be developed, implemented and evaluated to test their ability to achieve predefined key performance indicators for optimal kidney health within a culturally appropriate and cultural competent framework for kidney health and health prevention.

Proposed funding requirement
- Fund a cross-border executive level program leader and team to oversee in key pilot sites and which has authority to direct priorities across agencies. The executive team manages a coordinated implementation of strategies across all levels of governments, health services and with rural and remote stakeholders
- Design, implement and evaluate an Indigenous-led renal workforce model for rural and remote communities.
- Upfront commitment to fund the upscaling of successful models across regions in Northern and Central Australia where progressive kidney disease and ESKD are most profoundly impacting Australians

We believe sustainability in this proposed solution will achieve cost benefit through reduced expenditure on acute care evacuations, and costly management of diabetes and end stage kidney failure. An employed local workforce drives local economies, improves the standard of living for the Indigenous workforce, and creates health hubs with a focus on health maintenance.
Item 2: Meaningful knowledge sharing for the Aboriginal and Torres Strait Renal Patient Community

The Issue
Australia’s health care system advantages Australians living close to centralised and metropolitan services, and disadvantages those living further away. There is a physical divide between biomedical knowledge keepers (health expertise) who can assist access to biomedical treatments, and the Aboriginal and Torres Strait Islander peoples living in Australian regions which have the highest burden of diabetes and progressive CKD (health care users).

The Impact
Aboriginal and Torres Strait Islander patients and families want information for personal positive health, and personalised action plans which promote health and wellness. This divide diminishes accurate, relevant, efficient and effective knowledge sharing, and manifest as profound knowledge gaps.

Profound knowledge gaps may arise due to
1. Staff have low knowledge of effective methods of biomedical knowledge sharing between culturally distinct groups (the health carer and remote living Indigenous peoples),
2. Reduced time for effective knowledge sharing (competing clinical duties of understaffing)
3. Low workforce participation of Indigenous people who have knowledge of bicultural ways of working
4. Systems of health care which favours those who can access mainstream and centralised services, and
5. Models of care designed to meet the needs of service providers, rather than Aboriginal patients.

The Proposed Solution
Fit for purpose biomedical knowledge sharing processes and methods are required to address the profound knowledge gaps and to advance health of Aboriginal and Torres Strait Islander peoples. These processes will address key priority areas recognised by clinicians and patients and community and include: overweight, diabetes, heart and kidney health, and risks associated with chronic infection and inflammation.

Proposed Funding Requirement
1. Fund the development of a health curriculum developed in partnership with community, clinical leaders and adult learning specialists. The curriculum should be suitable for adult learners, people of variable education base and Indigenous learning strengths
2. Funding to develop a mixed-media resource packages suitable for individual patient and family use, in group meetings and use with a clinician. Resource package will need to be modified for local learning and knowledge strengths
3. Funding knowledge exchange events, appropriately facilitated by an Indigenous person and incorporating technical experts from well-patients and clinicians. We believe there is value in upscaling Kidney Yarning Circles: Pathways to My Home and the group meetings we have hosted as part of Catching Some Air.

We believe the funding request align to Closing the Gap in Indigenous health funding
Item 3: Preventative Health Care

The Issue
There is no comprehensive preventive kidney health care model which is suitable for Aboriginal and Torres Strait Islander people living in rural and remote areas known to have high risk of diabetes and progressive CKD.

The Impact
Undiagnosed and poorly controlled diabetes and progressive CKD contribute to excess end stage kidney disease (requiring dialysis), hospital care and excess mortality. These largely preventable conditions have devastating impacts on individuals, families, communities and economies in Northern Australia.

The Proposed Solution
A preventive care model is required and must work for Aboriginal and Torres Strait Islander people living with and at risk of developing diabetes and CKD. The model will require ground up design with adaptations from existing models (such as Deadly Choices), and requires funding of an Indigenous workforce in rural and remote communities.

Community based health prevention workers will comprise this innovative workforce, which will be locally recruited and trained. Their training expertise will include health promotion/prevention/health education. They will be linked into regional, state/territory wide and commonwealth hubs.

Commonwealth and Territory/State and Local governments and Aboriginal Community Control sectors must have a partnership agreement with renal patients within local communities/regional areas to discuss options for funding.

Proposed funding requirement
1. Financial support to expand the Deadly Choices health promotion program nationally, with emphasis on Indigenous employment
2. Financial support to implement and evaluate the impact on kidney health maintenance and reduced CKD progression of an Indigenous renal health curriculum within the Deadly Choices program
3. Funding to support primary health care staff training and competency in renal health
Item 4: Sustainable Workforce

The Issue
The current renal workforce across metropolitan, urban, regional, rural, remote and very remote communities is predominantly comprised of non-Indigenous staff. In rural and remote communities the skill mix is concentrated around generalist clinical skills.

The Impact
Aboriginal and Torres Strait Islander patients living with diabetes and kidney disease require highly accessible and safe health care. Clients report fear and mistrust of health systems oriented to non-Indigenous populations. Fear impedes health access and confidence.

The present workforce models in rural and remote communities suffer from chronic understaffing, recruitment challenges following retirement or high staff turnover, and a reliance on fly-in temporary staff. These factors significantly impact on the quality and continuity of care and trust for patients, carers and communities, and lead to poorer health outcomes.

The Proposed Solution
Strategic activities to increase the Indigenous health workforce in rural and remote areas are required, and should include:

- An Indigenous-led multidisciplinary team model of care which invests in building the professional capacity of the community based workforce and the primary health care sector.
- Training opportunities for local people as carer assistants for people with advanced co-morbid conditions and disability.
- Training program development to support local Indigenous people to access employment as health workers, practitioners and nurses within the MBS 13105 item for assisted dialysis in very remote Australia.
- Local community infrastructure to host health promotion and health maintenance activities
- Accommodation for the new workforce
- Affordable and reliable transport infrastructure to enable professional capability enhancement and networking with renal services

Proposed Funding Requirement
1. Funding to support development, implementation and evaluation of the impact of Indigenous-led work units
2. Funding training pathways and programs for community members to be trained and employed within the workforce
3. Funding capital investment in rural and remote communities to host health promotion activities, and safe and affordable housing for Indigenous workforce

These funding requirements are aligned to the National Aboriginal and Torres Strait Islander Health Worker Association plan, National Strategic Framework for Chronic conditions, Local Government Association, State and Territory workforce.
Abbreviations
C-AIR Catching Some Air- Asserting Aboriginal and Torres Strait Islander Information Rights in Renal Disease
CKD Chronic Kidney Disease
MBS Medicare Benefit Schedule

References
1. ABS. Australian Aboriginal and Torres Strait Islander Health Survey: Biomedical Results, 2012-13. 2014.