Dialysis care in Australia: a call for reform and innovation

Chronic kidney disease (CKD) disproportionately affects individuals from disadvantaged backgrounds, posing significant health and social challenges. It is estimated that 1.7 million Australian adults have CKD, which is largely driven by the increasing incidence of metabolic diseases such as diabetes, hypertension and obesity.[1] Kidney failure, the most advanced stage of CKD, requires kidney replacement therapy (KRT) and represents a substantial burden on both the health and economic systems in Australia. Currently, 15 518 adult and paediatric patients with kidney failure are treated with dialysis in Australia, with 76% receiving in-centre haemodialysis, and 24% using home dialysis therapies (peritoneal dialysis or home haemodialysis).[2] In 2020–21, CKD care cost about $1.9 billion, with 89% of the expenditure being spent on hospital services. Most of this expenditure is likely due to dialysis treatments, as dialysis accounted for 81% of CKD hospitalisations in 2021–22.[1] Although transplantation provides an alternative treatment option for patients with kidney failure, there were 926 new patients added to the transplant waiting list in 2022, with demand outpacing supply.[3]

Despite Australia's universal health care system, considerable inequities in access to dialysis care exist. A recent haemodialysis capacity survey conducted by the Australia and New Zealand Dialysis and Transplant (ANZDATA) Registry, in collaboration with the Australian and New Zealand Society of Nephrology (ANZSN), has highlighted these disparities. Patients undergoing haemodialysis typically require three 4.5- to 5-hour sessions per week to manage their kidney failure. This treatment schedule is essential for maintaining adequate filtration of toxins and excess fluid from the body. Given that dialysis centres generally operate six days a week with two shifts per day, each dialysis chair should ideally support no more than four patients per week. Exceeding a patient:chair ratio of 4:1 not only compromises the unit's ability to provide high quality care but also limits its capacity to respond to unexpected events, such as equipment failures or patient surges during a pandemic, thereby reducing overall flexibility and resilience.[4] This ratio also only accounts for long term haemodialysis patients and does not include the workload from hospital inpatients needing acute dialysis, such as patients requiring temporary dialysis and long-term patients requiring dialysis outside their local facility.[4]

In Australia, the average patient:chair ratio is about 3.33, but it differs considerably across different states and territories, from 0.25 to 6.75. Darwin and Perth have the highest patient:chair ratios, averaging 4.31 and 4.37 respectively. In contrast, the patient:chair ratio in Sydney and Melbourne averages between 3.61 and 3.64.[4] This variability persists for units outside of capital cities, with the patient:chair ratios in the Northern Territory and Western Australia averaging 4.68 and 3.97 respectively, whereas New South Wales and Victoria average 2.53 and 2.70 respectively.[4] However, these figures mask significant variability, with some centres accommodating up to six patients per haemodialysis chair, and only account for long term dialysis patients. Centres in western and south-western Sydney, for example, are stretching their nursing resources by running up to three dialysis shifts per day (including twilight shifts), increasing the patient:chair ratio to as high as 5:1 or 6:1.[4] The strain on these centres has led to compromised dialysis care, with some patients, even those with minimal residual kidney function, receiving dialysis twice weekly instead of the standard thrice weekly schedule. It has also restricted patients' autonomy in selecting their preferred modality and participating in shared decision making. Additionally, due to limited dialysis spaces, there is a lack of capacity to facilitate travel for social or personal reasons.[5] Although emerging evidence suggests that incremental haemodialysis may benefit some new patients commencing dialysis by preserving residual kidney function,[5] reducing dialysis frequency due to dialysis capacity constraints comes with significant risks, including increased mortality risk and hospitalisations due to inadequate dialysis.[6]

Key drivers behind the dialysis crisis

The dialysis crisis in Australia stems from several intersectional factors including rising demand, uneven distribution of existing resources, and the long term issue of system inequities, with increased centralisation of dialysis services to cities and larger towns.

Disproportional rise in the prevalence of advanced stage kidney disease in disadvantaged communities

This is one of the key drivers for the inequities in access to dialysis care. Underprivileged populations, including Aboriginal and Torres Strait Islander peoples and ethnic minorities, such as those with Pasifika ancestries, face a significantly higher prevalence of CKD, largely due to an increased burden of metabolic diseases.[7,8] Individuals from socio-economically deprived regions, including those from remote locations, often encounter multiple barriers to receiving timely and appropriate specialist care. These disparities, exacerbated by limited health literacy and chronic underinvestment in health care services in high need areas, directly contribute to the growing number of people requiring KRT.[1] For example, Mount Druitt in western Sydney experienced an annual growth in incidence of kidney failure from 9 patients in 2001–2003 to 32 in 2019–2021; a 263% increase against a background population gain of 21%. Similar findings were observed in the Brimbank local government area (Melbourne), with incidence growth rates rising from

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17 to 46; an increase of 212% against a background population gain of 22%.[9] More importantly, over 60% of people living in these areas are considered to be socio-economically disadvantaged.[9] As a result, the demand for dialysis services has surged disproportionately in certain regions, placing immense strain on health care infrastructure and further widening health inequities across Australia. Travel times also need to be considered, with patients from rural communities who require KRT needing to either spend time away from home for training or surgical procedures for home-based dialysis, or relocate for in-centre treatment, all of which incur additional costs.[10]

Workforce constraint

Workforce shortages represent a significant problem in Australia's dialysis and nephrology care system. Against the background of increasing patient load, health care workers face mounting job demands, including high case load pressures and elevated patient:nurse ratios, even in high acuity inpatient dialysis settings where more intensive care is needed. Higher patient:nurse ratios are associated with adverse outcomes, including increased rates of hypotension, shortened dialysis sessions, staff burnout and high workforce turnover.[11] Additionally, inadequate remuneration and low job satisfaction have contributed to the growing shortage of trained nephrology and dialysis nurses, especially in remote areas. Despite the dialysis crisis, about 27% of existing dialysis units have non-operational haemodialysis chairs, with nearly 75% being due to lack of funding or appropriately trained staff.[4] These workforce issues compound the strain on dialysis services, undermining the quality of care and exacerbating the disparity in access issues for patients across the country.

Shift from home therapy to in-centre dialysis

This move places an additional burden on dialysis capacity, with more than 50% of Australian patients treated with peritoneal dialysis experiencing treatment failure after 5 years.[12,13] The transition to in-centre haemodialysis is often unplanned, requiring dialysis centres at full capacity to either perform after-hours dialysis or dialyse patients in intensive care units. Additionally, given the frequency and chronicity of long term dialysis, patients transitioning to in-centre dialysis require access to services close to home.

Reduced organ donation rates since the coronavirus disease 2019 pandemic

As a result of the coronavirus disease 2019 pandemic, Australia experienced a notable decline in organ donation and transplantation activities. The deceased donor rate per million population (dpmp) dropped from the peak of 21.6 in 2019 to 16.4 in 2021. Although it has gradually recovered, reaching 19.4 dpmp in 2023, the target of 25 dpmp established by the Australian Organ and Tissue Authority has yet to be met.[14] Although most deceased donors for kidney transplantation have traditionally come from donation after neurological determination of death (DNDD), representing about 65%, there has been a steady increase in donation after circulatory determination of death (DCDD).[15] Currently, DCDD donors make up over 30% of all deceased donors in Australia, reflecting an important shift in the donor profile. Although our research indicates that transplantation using DCDD offers comparable outcomes with DNDD kidneys, about 40% of kidney transplant recipients who received a kidney from DCDD experience delayed graft function (DGF).[16] DGF necessitates a temporary period of haemodialysis before the transplanted kidney starts working, adding to the already strained dialysis capacity in inpatient centres. This additional dialysis burden exacerbates the barriers faced by dialysis services, further stretching resources in an already overburdened system.

Strategies to mitigate the crisis

Health professionals across Australia and New Zealand, along with multiple professional bodies involved in caring for patients with kidney failure, recently released a joint position statement regarding dialysis capacity.[17] Expanding dialysis infrastructure can take several years and there is an urgent need to identify and address reasons for these delays. Advancing real-time data collection on existing dialysis demand and infrastructure is vital to informing service planning for the future and addressing these issues will require systemic reforms to improve infrastructure, workforce capacity, and equitable access to care. These reforms need to be developed with input from all relevant stakeholders, including health care professionals, policy makers, patients and caregivers, and would include a long term commitment to invest in training and retention of nephrology and dialysis nursing staff. As greater travel times are associated with higher costs, lower quality of life and reduced access to dialysis care, it is vital that we incorporate geographic analysis when planning for service provision. Strategies to encourage home-based dialysis are crucial and need to focus on health care policy, local facility infrastructure and individual patient factors that affect use of home-based dialysis. Additionally, implementing culturally appropriate, community-led health initiatives in disadvantaged and high need areas can improve early detection, prevention and management of CKD and reduce the number of patients progressing to kidney failure.

Conclusion

Despite having a well structured, publicly funded system, the provision of and access to dialysis care varies considerably across Australia. These inequities are driven by a combination of factors, extending beyond financial and economic constraints. Workforce shortages, particularly of nephrology and dialysis nursing staff, represent a critical problem, limiting the ability of health care facilities to meet the growing demand for dialysis services. To address these challenges, sustained efforts and collaboration between health care professionals, policy makers and communities are urgently needed to mitigate the impact of dialysis burden, reduce disparities and

improve outcomes for all patients living with kidney failure across Australia.

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