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## Kidney disease in Australian Aboriginals: time for decisive action

*Can governments and healthcare services in northern and central Australia afford not to get organised?*

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The continued alarming rise in incidence of renal failure in Australian Aboriginals living in the Top End of the Northern Territory (NT) is documented in this issue of the Journal by [Spencer and coworkers](#)<sup>1</sup> from the Royal Darwin Hospital and the Menzies Institute of Health Research.

Are their findings an isolated observation, why is it happening, and what should be done to address the problem?

**The numbers are real.** The Darwin incidence and prevalence figures for endstage renal disease (ESRD) in Aboriginals are entirely consistent with figures from other Aboriginal community surveys of the Kimberley, Pilbara and Goldfields regions of Western Australia (WA). The WA Health Services Research Linked Database shows that in the past 8 years there has been a yearly rise in (age-standardised) incidence of dialysis from 67 to 819 per million in Aboriginal men, and from 130 to 758 per million in Aboriginal women. The current rates are, respectively, 12-fold and 20-fold more than the non-Aboriginal rates (Ms K Brameld, Research Officer, Department of Public Health, University of Western Australia, personal communication).

Whole-of-Australia incidence data recorded by the Australian and New Zealand Dialysis and Transplant Registry (ANZDATA Registry) also support these findings (Box), with a marked disparity increasing over time between rates for Aboriginals and non-Aboriginals, particularly in the north of Australia.

**Comparative incidence (new cases) of endstage renal disease in Aboriginals and non-Aboriginals.\* Values are absolute numbers, with patients per million population per year in parentheses (non-age-standardised)**

	1989–1992	1993–1996
Aboriginals		
Darwin	43 (346)	87 (620)
Northern Territory, Queensland, and Western Australia	163 (268)	330 (404)
All Australia	214 (194)	403 (270)
Aboriginals and non-Aboriginals		
All Australia	3893 (58)	5261 (73)

\*Source: Australian Bureau of Statistics, references 1 and 2.

The difference in ESRD rates between Aboriginal and non-Aboriginal populations, described by [Spencer et al](#), increases after age-standardisation and is further accentuated by the non-Aboriginal population in Darwin having a lower ESRD rate (37-47 per million) than the non-Aboriginal population of the rest of Australia (62 per million in the same time period). This lower rate probably reflects the "healthy migrant worker" phenomenon, seen in other isolated cities such as Perth, with relatively low rates of chronic diseases.

The increasing number of new cases over time represents a combination of better ascertainment, with the development of the Aboriginal Medical Services, greater acceptance of ESRD therapy by the Aboriginal community, as well as a probable true increase in incidence of renal disease. The trends predate the appointment of a full-time nephrologist in Darwin in 1996.

Why is it happening?

**The problem has multiple causes.** An unfortunate mix of racial predisposition is aggravated by multiple adverse environmental and metabolic factors.<sup>3</sup> Aboriginal kidney biopsy and autopsy data from the University of Melbourne have shown a range of pathological states (diabetic, hypertensive, and proliferative), underpinned by a remarkable increase in glomerular size of up to threefold normal.<sup>4</sup> Whether this unusual glomerular change is entirely genetic or is exacerbated by intrauterine malnutrition followed by subsequent dietary excess has yet to be resolved.

The infective insults present in Aboriginal communities have been amply documented,<sup>5</sup> with repeated bacterial infections of ears, nose, chest, skin, gut and genitourinary systems, as well as endemic intestinal parasites. Even in the absence of recognised nephritogenic organisms, systemic infection will activate glomerular proliferation, affecting mesangial cells in particular.<sup>6</sup>

It is probably the development of widespread obesity and "Syndrome X" (raised body mass index, blood pressure, blood glucose, and triglyceride levels; and insulin resistance, and disordered uric acid metabolism) that most closely parallels the renal

disease epidemic.<sup>7</sup> The background social and legal factors involved are well described:<sup>8</sup> loss of employment after voting rights and equal-pay legislation were enacted, access to alcohol, increased welfare benefits, and availability of a high-fat, high-carbohydrate diet. It is ironic that the outstanding success in correcting malnutrition and infective disease in Aboriginal children over the past 30 years should have contributed to creating a cohort of obese adults with hypertension and diabetes.<sup>9</sup>

Alcohol has several indirect but definite adverse renal effects. Each 10 g of alcohol consumed causes a rise in blood pressure in both white<sup>10</sup> and Aboriginal<sup>11</sup> populations. The carbohydrate load causes obesity, increasing the risk of diabetes and subsequent diabetic nephropathy. Alcohol both stimulates intestinal production and reduces hepatic clearance of IgA, increasing the risk of IgA nephropathy. (Although this is the commonest form of chronic glomerulonephritis in the non-Aboriginal population, it accounts for only a minority of cases of renal disease in Aboriginals.) Smoking is also recognised in epidemiological surveys as an independent risk factor for renal disease.<sup>12</sup> Both these behaviours are very common in Aboriginal communities.<sup>13</sup>

What can be done about this renal disease epidemic?

**Remote-area dialysis works.** Although renal transplantation usually gives the best rehabilitation at the lowest cost, its application is limited by scarcity of donors (cadaveric or fit live-related), disparate tissue typing between Aboriginal and white populations, and unsuitability of some recipients because of infections or poor medication compliance. The next-best option is self-care dialysis.

There is a natural and understandable cultural imperative for patients in kidney failure to wish to return to their families and homes. How to deliver dialysis in remote areas is a challenge that has been successfully met by a number of nephrology units around Australia. In Townsville, Queensland, with a semi-urbanised and relatively sophisticated Aboriginal population, a chronic ambulatory peritoneal dialysis program has been in place for over a decade (Dr P de Jersey, Nephrologist, Townsville Base Hospital, personal communication).

In Western Australia, since 1989, both CAPD and self-care haemodialysis have been delivered in areas up to 3500 km away from the parent nephrology unit. This has required some innovative technical approaches (such as inline water coolers, and repressurisation pumps) and training of staff to ensure cultural sensitivity (eg, using photographic rather than written instructions, and showing respect for name avoidance after family deaths).<sup>14</sup>

These nephrology units have shown that the challenge can be met with complication rates and dialysis survival that approach and occasionally better those observed in metropolitan dialysis units treating white populations.<sup>15</sup> While about 25% more expensive than metropolitan self-care dialysis, remote-area dialysis is still half the cost of maintaining dependent, depressed and non-compliant patients against their will in the city.

However, there remain patients and areas where self-care dialysis is not practicable. Hospital dialysis units can benefit from the use of Aboriginal liaison officers to improve cultural awareness, and to limit the sense of alienation for patients. Reorganisation of renal referral patterns around geographical proximity rather than along State borders (eg, referring patients from East Kimberley to Darwin, rather than to Perth) would also reduce the extent of dislocation.

Screening and intervention programs are a priority. Most of the necessary components of such programs are in place and merely require coordination for maximum efficiency and effectiveness. Chronic disease screening (diabetes, hypertension, obesity) easily lends itself to the incorporation of urinalysis for protein, which, if positive, can be followed by serum creatinine estimation. Given the high rate of medical clinic attendance in Aboriginal communities, such screening can be opportunistic, reserving targeted case finding for a select identified few.<sup>16</sup>

The prime target remains improved environmental conditions.<sup>17</sup> Availability of healthier food choices can reduce renal injury.<sup>18</sup> Improvements in lifestyle and medication compliance have been achieved in a sizeable proportion of communities with active programs, particularly where there is Aboriginal "ownership" of the service. Reducing the blood pressure level below 140/90 mmHg (with a target of 125/85 mmHg) can slow the rate of progression of renal disease by up to 50%.<sup>19</sup> Further, there is a particular role for angiotensin-converting enzyme inhibitors in proteinuric renal diseases, with or without diabetes.<sup>20</sup>

The cost-benefit equation is obvious. Every year of dialysis deferred for a single patient could pay the salary of another Aboriginal health worker. Can northern and central Australia healthcare services and governments afford not to get organised?

**Mark A B Thomas**

Head, Department of Nephrology  
Royal Perth Hospital, WA

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