Nganampa Health Council Dental Program: Remote Dentistry in the Australian Desert—Partnership or Perish

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Abstract: The Nganampa Health Council (literally "Our Health Council") is an Aboriginal community-controlled Primary Health Care service established in 1983. It was born out of the political struggle for Aboriginal Land Rights in South Australia which culminated in The Anangu Pitjantjatjara Yankunytjatjara (APY) Land Rights Act, 1981, a milestone in Indigenous Land Rights both in Australia and internationally.

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The Nganampa Health Council (literally "Our Health Council") is an Aboriginal community controlled Primary Health Care service established in 1983. It was born out of the political struggle for Aboriginal Land Rights in South Australia which culminated in The Aṉangu Pitjantjatjara Yankunytjatjara (APY) Land Rights Act, 1981, a milestone in Indigenous Land Rights both in Australia and internationally.[1]

The APY Lands occupy the arid northwest corner of South Australia (SA) and cover approximately 103,000 square kilometres, 10% of the land area of South Australia. *Aṉangu*, the Pitjantjatjara and Yankunytjatjara language term for Aboriginal person, number approximately 3,000, and live in nine communities linked by corrugated dirt road and scattered across the vast area. Traditional boundaries of Aṉangu country pre-date European occupation and in fact extend well beyond the Western Australia and the Northern Territory and APY Lands borders of SA, and include the iconic Australian landscape of Uluṟu and Kata Tjuṯa. It is a monumentally beautiful, often harsh, and diverse land binding Aṉangu culture, kinship and identity through *Tjukurpa* (traditional Aṉangu Law) for over 40,000 years.[2]

In 1937 the Presbyterian Mission at Ernabella (Pukatja) was established. It was a humanitarian response to the impacts of severe drought, famine and frontier exploitation on Aṉangu, and was driven by the compassionate and visionary Scottish medical practitioner Dr Charles Duguid.[3] Aṉangu are traditionally a hunter-gatherer society and continue to adapt to the dominant cash economy of mainstream society, in a social context of high welfare dependency, limited opportunities for employment, and

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a linguistic context in which Australia's majority language—English—is learned as a second language. In spite of a reliance on store-bought foods, favourite *bush tucker* (native animal and plant food) remains highly sought after.

In the period 1982–84, oral health surveys coupled with basic dental care delivery were commissioned by the Aboriginal Health Organisation (AHO) of South Australia.[4] The Nganampa Health Council Dental Program commenced in 1986 when it took over this responsibility from the AHO. Responsive and flexible staffing practices have been sustained since the program's inception, and have included both locum and full-time clinicians and assistants. Currently a dentist and assistant, together with a part-time program consultant, staff the program.

Access to care is aided by a custom-built mobile dental clinic and two dental surgeries located in the health clinics in the communities of Pukatja and Iwantja. Prior to establishment of the program, accessing clinical dental care for Anangu was both financially and socially a daunting 1000km to 1600km round trip to and from the nearest major town of Alice Springs in the Northern Territory.

Program Objective

The Goal of the Dental Program is "To enable Aṉangu on the APY lands in South Australia to achieve oral and general health improvement through the delivery of an accessible, appropriate and effective oral health program." The dental team visits each of the communities over an 8-month cycle, and the mobile clinic (complementing the 2 fixed clinics) is the cornerstone of enabling regular access to oral health care in this remote context.

Program Method: Strategies and Partnerships

Key program areas have been prioritised and include Oral Health Promotion, Emergency Service, School Dental Program, Adult Dental Program, Special Needs, and Prosthodontics.

Oral Health Promotion has included the Mai Wiru ("good food/healthy food") project of the late 1980s and early 90s developing nutritious and low glycaemic index food selection and preparation skills with a group of Aṉangu women with diabetes. It arose from recognition by NHC dentist Colin Endean of the association between uncontrolled diabetes, and the severe periodontal disease and early tooth loss that Aṉangu, and especially young women, were experiencing. This project has been considered germinal to the 2002 Mai Wiru Regional Stores Policy. The NHC has facilitated the implementation of this policy across the APY Lands community stores, thereby improving access to affordable nutritious food for all community members. Preschool screening/early caries identification and treatment referral, tooth brushing/fluoride toothpaste programs in schools, and support for oral health education in schools are additional key elements of the Oral Health Promotion strategy. It is notable that there are naturally occurring high fluoride levels in water supplies with approximately 50% of bores exceeding 1.5ppm fluoride.[5]

The Emergency Service provides care to Aṉangu seeking resolution of "a dental

problem." This service is a component of all our clinical programs, where trauma, infection, bleeding, and intractable pain receive priority care.

The School Dental Program is a core clinical activity of the NHC Dental Program. The service passionately adopts a Minimal Intervention Dentistry (MID) philosophy and approach with a focus on caries risk assessment and routine targeted use of fluoride varnishes and therapeutic and preventative fissure sealants, oral hygiene and diet advice and instruction.[6] Where restorations of the primary dentition are required, glass ionomer resins are the material of choice. Local anaesthetic prior to restoration is avoided wherever possible, in recognition of high numbers of children with 'needle phobia' in part due to their experience of the administration of intramuscular antibiotics in the treatment of prevalent respiratory and skin diseases. The atraumatic silver fluoride (AgF) technique as developed in the remote Aboriginal community of Bourke, New South Wales by Graham Craig and colleagues in the late 1970s has been a mainstay of community and patient acceptance of the NHC school program.[7] It has enabled efficient and effective treatment of carious deciduous teeth, with minimal tooth preparation and without local anaesthetic that might otherwise require General Anaesthetic (GA) referral for restorative dental care. The use of AgF is a critically essential MID technique of the NHC dental program and can be considered both a precursor to, and complemented by the atraumatic restorative technique (ART) promoted by the World Health Organisation.[8]

The Adult Dental Program provides general and emergency clinical care and accepts patient referrals both from within and external to the NHC clinical service. Walk-in clients constitute a major proportion of presentations, with 59% (2012/13) of total adult attendances being for emergency care.

The Special Needs priority is in response to the high prevalence of type 2 diabetes (diagnosed in 38% of adults over 30 years of age), rheumatic heart disease and kidney disease.[9] A referral and recording process is incorporated into Communicare, the Internet-based electronic patient management system, which is utilised throughout eight NHC clinic sites on the APY Lands.[10] Both general health staff and the Chronic Disease Program generate internal referrals to the Dental Program.

Prosthodontics on the APY Lands takes the form of the provision of dentures. The increasing demand for dentures is largely related to loss of permanent teeth resulting from aggressive gum disease in association with diabetes.

Partnerships essential to the effectiveness of the key program areas can be considered both within the NHC itself, and external to the organisation.

Internal NHC partnerships with the dental program include Aboriginal Health Workers, Women's Health/Midwives, Child Health Program, Chronic Disease Program, Aged Care Program, and Medical Practitioner and Registered Nurse referral. These connections enable a two-way referral and information exchange between the above staff and programs. Aboriginal Health Workers in particular can be both cultural broker and a direct link between programs and the community and its members. They play an important role in facilitating community access and information sharing with clinical services.

External partnerships of strategic significance include the following:

The program works closely with the Principals and staff of APY Schools at 8 sites, to

coordinate school dental examinations as well as supporting tooth brushing programs and access to education resources for teachers.

Playgroups for 0–4 year-olds were established in 2012 by education authorities on the APY Lands in order to offer parents and their children a social, educational, and child- rearing skills development environment, with the support of Child and Family Health Service nurses. The nurses include what is known as *Lift the Lip* caries screening (an initiative of the SA Dental Service across the state), with early referral to the NHC Dental Program as required. The dental program also screens Playgroup children during our eight-monthly community visits, with fluoride varnish application where appropriate.

Northern Territory Health Dental Clinic Alice Springs has provided long standing collegiate, specialist oral surgery, GA referral and emergency support which has been crucial to sustaining comprehensive and accessible oral health care for Anangu of the APY Lands.

SA Dental Service, the peak public oral health organisation of the state, provides technical, clinical and resource support critical to sustaining the NHC program.

Australian Research Centre for Population Oral Health (ARCPOH), University of Adelaide, has been a partner in establishing systematic data collection and analysis since 1999. The data-collection instrument is a paper optical mark read (OMR) scan form whereby demographic and clinical exam and treatment data is recorded at the dental appointment using a 6B pencil. The NHC is also collaborating with ARCPOH and the Maari Ma Health Aboriginal Corporation based in Broken Hill, NSW in a randomised control trial of the AgF technique.

Program Results

Key Performance indicators (KPI) measuring program outputs reflect the MID approach, with fissure sealant and fluoride varnish rates close to 100% in the child population. Emergency attendance rates for children are consistently less than 3% due to the comprehensive access to care of this population group, while adult emergency rates have ranged from 59–90%. This reflects the high burden of oral disease and unmet treatment need in the adult population.

Health outcome /oral health status index of decayed missing and filled primary teeth (dmft) for children of the 5/6 year old age group has fluctuated from 3.2 in 2000, to 4.51 in 2012/13 (SA 2009=2.02). This upward trend is concerning and it is anticipated that accessing the ~~newly~~ [recently] formed 0–4 year-olds Playgroups will assist prevention and early intervention strategies as discussed above. The dmft =0% is 16.9% on APY Lands (SA 2009 =53.3%), which highlights the widespread caries experience of this age group, compared to the general SA population.

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The 12-year old index of decayed, missing, filled permanent teeth (DMFT) has consistently been at 1.0 or below since yr 2000, except for a rise to 1.33 in 2010/11. The 2012/13 DMFT = 0.88 (SA 2009 = 0.95). This is a very positive outcome and together with the DMFT=0% of 53.1% (SA 2009 = 56.3%) is a strong indicator of the effectiveness of the continuity of access to care and sustained preventive strategies of the NHC School Dental Program.

Table 1.

AVERAGE ADULT DMFT IN 2000 AND 2012/13 BY AGE GROUP ON THE APY LANDS OF SOUTH AUSTRALIA

	15–19 yr		20–29 yr		30–39 yr		40+ yr	
Age/Year	**2000**	**2012/13**	**2000**	**2012/13**	**2000**	**2012/13**	**2000**	**2012/13**
Decayed teeth	1.33	0.82	1.89	2.08	1.62	1.89	1.3	1.52
Missing teeth	.32	.19	.95	.94	2.16	2.73	5.75	7.29
Filled teeth	1.05	1.2	2.05	1.51	3.07	1.91	1.62	1.52
DMFT[a]	2.70	2.21	4.89	4.53	6.85	6.53	8.67	10.33

[a]DMFT: Total average decayed, missing, and filled teeth.

Adult DMFT data of year 2012/13 compared to year 2000 (see Table 1) have reduced modestly across reported age groups except for the 30–39 years and 40 years and older age groups where there is increasing tooth loss associated with high prevalence of diabetes related periodontitis. In 2013/14, 45.5% of adults presenting with diabetes had severe periodontal disease (Community Periodontal Index (CPI) Score 4, periodontal pockets 6mm or more) compared to 3.3% of adults without diabetes.[10] Complete edentulousness is also increasing in association with increasing prevalence of diabetes-related severe periodontal disease.[4] There is a caveat regarding the adult data. These data include a selective sample of approximately 20% of the adult population, biased towards emergency presentations, and are not necessarily representative of the population as a whole.

Discussion

Multiple strategies and trusted partnerships have been critical to establishing and sustaining an accessible, appropriate, and effective oral health program in the communities of the remote APY Lands in central Australia.

Systematic and regular data collection and analysis of program performance/outputs and oral health status/outcomes in collaboration with ARCPOH has been essential to program planning, evaluation and accountability to both the community and government funding bodies.

The data highlight key issues and challenges to oral and general health improvement on the Lands. They include the 0–6 year-olds' increasing caries experience compared with State-wide benchmarks; adult DMFT with high proportion of DM and low F in older age groups suggest unmet restorative need, compounded by adults frequently avoiding attendance for routine care appointments; diabetes-associated severe periodontal disease and early tooth loss/edentulousness, (what has been described as an epidemic of tooth loss) is also suggested in the high M (missing tooth) component of older age group adult DMFT data.[4]

Responses to these issues have required strategies not restricted to clinical dental care and referral between health disciplines. They have included school tooth brushing programs, screening and liaison with 0–4 year-olds Playgroups, fluoride varnish application external to the clinic setting, and the genesis of the Mai Wiru nutrition strategy.

The ultimate partnership that has underpinned continuity of the NHC dental program and its achievements since 1986 has been with Anangu themselves, through the governance and operation of the community controlled Nganampa Health Council, "our" health service.

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