Dental Services in the Katherine Region, Northern Territory: An Outback Experience

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Abstract: **Dental practice in the Northern Territory of Australia has to overcome a number of logistical problems related to the vast area and the low population density. The population is largely of Aboriginal origin and has significant medical problems including problems relating to dentistry. This article describes the present system for provision of dental care in this area, along with the authors' experience of a scheme involving co-ordinated care trials aimed at improving the health of the population.**

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Clinical Relevance: **This community-based article highlights the problems in providing dental services over a large area of the Northern Territory of Australia and treatment of the indigenous population in suboptimal clinical conditions.**

The Northern Territory (NT) of Australia is 1 346 200 square kilometres of vast open spaces. It represents about one-sixth of the area of the Australian continent (Figure 1), and yet has less than 1% of the Australian population, around 180 000 people. The NT has five regional centres – Darwin, Gove, Katherine, Alice Springs and Tennant Creek.

Most (66%) of the NT population resides in one of the five regional centres, and in these regional centres 15% of the population are of Aboriginal origin.[1] The remaining population live in remote areas – 70% are Aboriginals living in various communities and 17% are non-Aboriginals, who live in remote stations or work in the communities.

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Territory Health Services community profile data from 1996 showed that the Aboriginal people utilize 51% of the health resources.[1]

The town of Katherine (Figure 2) is situated 330 km south of Darwin in the Top End of the NT. The climate is subject to the north-west monsoons and therefore has a winter dry season, from April to November, and a wet season summer. The town itself has a supermarket and general, if limited, shopping facilities.

Katherine township has a population of approximately 10 000. The community includes a Royal Australian Air Force base and has a multicultural mix. Population statistics from 1996 revealed that 15% of that population are of indigenous origin, 72% are White Australians and 13% are from overseas.[1] The median age of the population is 29 years (as is that of the rest of NT). Katherine also has a higher proportion (at 11.3%) of children of 0–4 years old in the population than the other urban centres. The Katherine district covers an area of 336 000 square kilometres, stretching from Western Australia to Queensland (Figure 3).

The Katherine dental department incorporates a three-surgery dental clinic in Katherine itself, with 13 rural clinics reaching from Lajamanu and Timber Creek in the west to Ngukurr and Borroloola in the east (Figure 3). The overall population of these surrounding communities is around 4000 people. The population and general amenities available at each community are extremely variable, as are the clinical facilities. The Katherine clinic is ideally staffed by two dentists, dental nurses and reception staff, the dentists and therapists covering the rural clinics on a rota basis. However, recruitment for dentists is difficult and staffing can be intermittent.

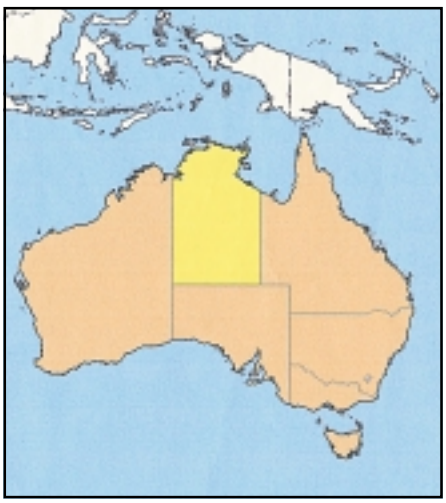

***Figure 1.** The continent of Australia: the Northern Territory is highlighted in yellow.*

Figure 2. *Katherine township – traditional land of the Jawoyn people.*

CULTURAL DIFFERENCES

There are marked differences in culture between the Aboriginal and non-Aboriginal peoples, which can present challenges to health workers. NT Health Services are very aware of this situation, and for this reason it is compulsory for all new Territory staff to attend an Aboriginal Cultural Awareness Programme (ACAP). The ACAP course is a four-stage programme taking place over 6 days which, amongst other issues, looks at history, culture and values, communication, racism, and primary health care. The course is delivered by health workers, both White Australian and Aboriginal.

Communication is one of the key problems in the dentist–client relationship: for many Aboriginal people English is their third or fourth language after various Aboriginal dialects. Non-verbal communication with Aborigine people is also quite different from that with non-Aborigine populations – for example, they often regard eye contact as threatening and may find actual physical contact (such as patting a shoulder) intimidating.

Aboriginal culture has a different understanding of time as we know it, making strict appointment systems difficult to maintain. Patients will attend only when a pain has become intolerable and they have no other priorities for that day.

ACCESS TO DENTAL SERVICES

The Territory Health Services provides dental and medical care for the Katherine region and the 13 rural clinics. The objectives of the dental service are to establish and maintain good oral health amongst the following target groups (irrespective of race) through the provision of accessible services:

- infants, children of pre-school, primary school and high school age;
- territorians disadvantaged by distance from facilities;
- financially disadvantaged Health Care Card holders;
- physically and/or mentally disabled people;
- aged and/or homebound Health Care Card holders;
- long-term institutionalized (hospitals, prisons);
- pregnant and nursing mothers.

Preschool And Primary School Children

Children's dental care is carried out mainly by the dental therapists, who are trained within the University Dental Schools on a 2-year programme. The accepted practice is that all children of primary school age are seen by a dentist for treatment planning before commencement with a therapist. At present, none of the therapists working within the Katherine region are of Aboriginal race.

The therapists have their own rota system of visiting the communities to attend to the dental screening and management of primary school children. They travel with their own nurse and are not accompanied by a dentist. Therapists carry out a full range of treatment on primary teeth, including extractions and pulpotomy procedures. More complex treatment on permanent teeth is referred to a dentist.

Adults And High School-Age Children

The visiting rural dental service provides emergency dental treatment and routine care for all. Territorians living 'outbush' qualify as one of the target groups covered by this dental service because they are disadvantaged by distance from any dental facilities, living hundreds of kilometres from their nearest dental surgery. Treatment is therefore provided in the community clinics by visiting dentists on a rota basis. However, care provided is often compromised by lack of radiographic equipment and obvious difficulties in continuing care.

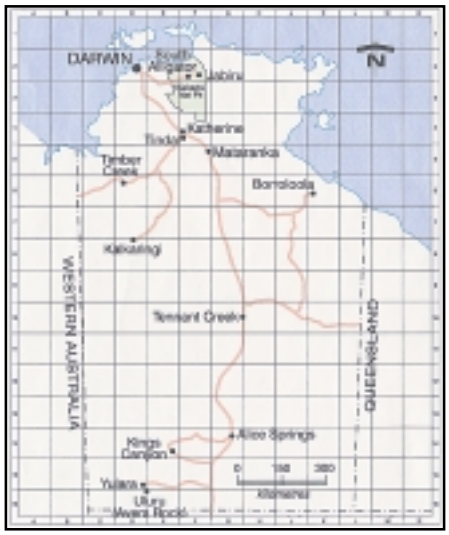

Figure 3. *The northernmost area of the Northern Territory (Top End).*

In Katherine town, if patients are not Health Care Card holders, they must go to a private dentist for follow-up treatment, even though they may have received free initial treatment 'out bush' on the basis of their 'disadvantage by distance'.

DENTAL STAFFING

Throughout Australia there are real difficulties in finding 'local' dentists to work in rural and isolated areas,[2] and for this reason many clinics have to recruit from overseas and rely upon 'backpacker' dentists (recent dental graduates combining work experience with travel) to staff them. There is inevitably a high turnover of staff. This presents obvious problems in the provision of continuing care for clients and expensive time-consuming education for new staff.

In Katherine there is one private dentist, a public dental clinic and small hospital. The dental clinic is situated within the town's Government Centre and therefore has close relations with other health and public services. Since June

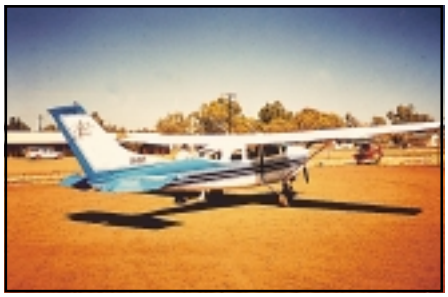

Figure 4. *AirMed Transport for dentist and assistant to the 'outbush' communities.*

1999, no public dentist has been solely based and working in Katherine, and the well equipped public dental clinic has been empty. Limited emergency dental treatment cover has been arranged with the private dentist through government funding.

CO-ORDINATED CARE TRIALS

We qualified in 1995 and decided to seek work in Australia both for travel and to gain clinical dental experience. Owing to the paucity of dental services, we had to deal with quite a backlog of work in the Katherine area – some of the communities (such as Yarralin, 500 km south-west of Katherine; approx. population 410) had not seen a dental worker for over 3 years. The position of one of us (that of District Dental Officer) was funded by the NT government, the other was funded through the newly formed Katherine West Health Board. In 1995, the Commonwealth government (governing body to improve standards including health) proposed the establishment of co-ordinated care trials in several specified areas and part of our work was concerned with the implementation of these trials.

The overall objectives of the trials were:

- chronic disease management;
- the development of care plans;
- establishment of pathways to monitor disease.

In the NT, two areas were selected for the first trials – the Tiwi Islands and Katherine West. The co-ordinated trial for Katherine West was designed to run until 31 December 1999.

The Katherine West Trial

The Katherine West Health Board consists of 14 Aboriginal members with previous experience of government service, from eight or nine different tribes, and speaking eight to ten different languages. The population of the trial area is 3060. Approximately Aus$450 has been allocated per head of population for healthcare services, to be purchased by the Board as deemed necessary (this allows the Board self-determination over health issues).

One of the areas for concern is the dental health of the population: a recent study revealed that Australian aboriginal children had a dmft (decayed, missing or filled teeth) index twice that of White Australian children and recommended preventive strategies.[3]

It is important to provide an acceptable service to the communities in the Katherine West trial area, with an adequate number of visits to each. Statistics on travel time, the number of patients seen (and whether adults or children) are forwarded to the Board. Funding is available to the dental therapists who carry out most aspects of dental care on children under high-school age. The Co-ordinated Care Trial Board can then decide on the most financially beneficial way of obtaining dental services.

Rural Visits

Bush trips are carried out according to pre-arranged service level commitment and funding. As driving to the various communities involves many hours 'down time' and may require use of 4-wheel-drive vehicles (and even so, routes may be impassable in the wet season), the dentist and assistant either travel with the regular doctors' flight (AirMed) or charter a separate plane from Katherine (Figure 4). Travel times vary: typically a 2-hour flight or a 2–5-hour drive in a 4-wheel-drive vehicle over unsealed roads. Many communities have significant sacred sites within their vicinity and any healthcare professional requires Aboriginal land permits to enter these areas.

Once the rural timetable has been compiled, the relevant community health centre must be consulted, to ensure that accommodation will be available and that posters advertising the dental visit will be displayed. Rural bush trips may involve spending between a day and a week in the community.

A supply of dental gear, ranging from simple restorative material to drill carts, suction units and portable chairs, depending on the facilities already present, can be taken 'out bush' (Figure 5).

The Remote Community Clinics

On arrival at the community health clinic (Figure 6), the surgery is set up and ready to accept patients. It is very difficult to estimate the number who will attend, as the attendance rate will be determined by many factors – a recent funeral of a community member or other ceremony can bring the whole community to a standstill, and very few patients will attend for either medical or dental treatment on such an occasion. This can be very frustrating for the dentists, especially as the majority of patients may attend on the last day and (owing to the rigid flying time) may therefore not receive optimal treatment. This problem is being addressed by increasing poster advertising and attempts to notify community members about forthcoming visits.

The dental treatment provided can range from simple restorative work to fitting dentures; however, the largest proportion of our work involved relief of pain by extraction of teeth.

MEDICAL HISTORY AND DIET-RELATED DISEASE

An accurate medical history of an Aboriginal person can be difficult to ascertain owing to language barriers and poor self-knowledge of medical problems. The state of Aboriginal health today is very poor and the number of deaths from 'lifestyle disease' (e.g. poor diet, alcohol

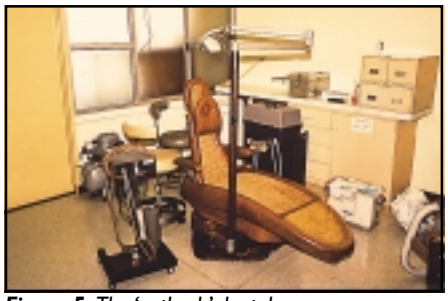

Figure 5. *The 'outbush' dental surgery.*

abuse) is increasing. The main cause of death for both men and women is ischaemic heart disease – this is ten times more common in Aboriginals than in the rest of the Australian population.

Major health problems are type 2 diabetes mellitus and rheumatic fever. A recent review suggests that 10–20% of Aboriginals in the NT suffer from type 2 diabetes,[4] although the level may be as high as 40% of women in some communities. The high rate of diabetes is not simply caused by too much sugar or fat in the diet, obesity, lack of exercise or a genetic predisposition: it is also a result of colonization because Aboriginal people were generally in good health before European settlement – lean, fit and strong.[5] Early studies show they were well nourished with low cholesterol, low blood pressure, increased haemoglobin and normal vitamin levels.[6] Dietary studies recently carried out show that the Aboriginal people living in remote areas have little variety in their diet, which is generally poorly balanced.[7]

- Over half the energy taken in is from white sugar, bread and meat.
- Intake of fatty meats is high.
- Sugar intake is excessive – mostly in white sugar and soft drinks. The average amount of refined sugar eaten per person per day is more than 258 g of white sugar equivalent.

DENTAL DISEASE

The high intake of white sugars and soft drinks creates a high caries rate in both deciduous and permanent dentitions. In an age-matched comparison of 9-year-old non-Aboriginal and Aboriginal children to assess the amount of decayed deciduous (d) and permanent (D) teeth, the rate of non-Aboriginal children with more than 4 d + D was 2.3%, whereas that in Aboriginal children was 14.2%.[8] The dentition of the children was also noticeably different from that of older Aboriginals, most of whom have been brought up in communities where the water was naturally fluoridated. This, combined with the lower access to high-sugar foods through poverty and location, has contributed to the observation that historically Aboriginal groups have had substantially less dental caries than non-Aboriginal groups,[9] as can be confirmed by clinical examination of the older Aboriginal population. Overseas-born children also had more fillings and fissure sealants than the non-Aboriginal Australian-born children, indicating that the greatest need for dental treatment, in Aboriginal children, was not being fulfilled.[9]

The colonization by Europeans has caused a change in Aboriginal lifestyle; a comparison of the traditional hunter–gatherer and Western lifestyles shows decreased physical activity level and intake of dietary fibre with a concurrent increase in intake of simple carbohydrates and high sodium to potassium ratio. This has created a problem group within the Aboriginal population, described as 'transitional' and showing all the ravages created by very high sucrose intake.[10]

In the early 1980s, a study was carried out in which a group of Aboriginal people suffering from type 2 diabetes went back into the outback bush land to lead a hunter–gatherer lifestyle for 7 weeks.[7] During the experiment, their health and nutrition greatly improved, demonstrating that increased physical activity and low-energy diet could help manage and prevent the lifestyle diseases commonly seen today in Aboriginal people.

CONCLUSION

Preventive dentistry in the NT is still in its early stages and most treatment involves relief of acute problems. Current provision of dental care is centred around extraction of the 'painful' tooth, but the more ideal situation of regular screening and prevention for all Aboriginal clients in the communities is a hope for the future.

The short time we spent working in the Katherine region gave us valuable experience both in learning about the Aboriginal culture and the task of providing a satisfactory dental service across an area larger than Great Britain. It remains the case, however, that the area of the NT in which we worked is desperately in need of more dental healthcare professionals to treat the increasing amount of dental and oral disease.

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Figure 6. *A typical Aboriginal community clinic.*