

## IMPROVING ACCESS TO SPECIALIST DENTAL SERVICES USING A TELEHEALTH PLATFORM IN VICTORIA, AUSTRALIA

Jennifer Baker RN, BA, MPH

Dental Health Services Victoria, Melbourne, Australia

### Abstract

Australians in rural and remote locations have worse health outcomes compared to that of their metropolitan counterparts and this is due in part to poor access to health services. Public specialist dental services in Victoria, Australia are predominantly offered in the capital city Melbourne. For rural patients this can mean considerable travel, out of pocket costs and delays due to long wait-times. In 2015 Dental Health Service Victoria (DHSV) embarked on a pilot project to enable access to rural clients by linking community dental clinics with the Royal Dental Hospital Melbourne using a Telehealth platform. **Aim:** The objectives of the pilot were to develop specialist care pathways and enable patient access, support community clinicians to work to full scope through a peer education approach and to identify the appropriate equipment and telehealth platform to support this model of care. **Method:** DHSV launched its pilot project June 2015 collaborating with four Community Dental sites. The specialties trialled during the pilot project were Oral Medicine, Oral Surgery, Endodontics and Orthodontics. An action based research framework was adopted so that improvements to the operational framework and clinical pathways could be made throughout the life of the pilot. **Results:** By the end of the pilot programme, DHSV was satisfied the program objectives had been met and the modality was accepted by specialists, community dentists, and patients as a satisfactory substitution for a traditional face-to-face referral and consult mode. **Conclusion:** Based on this outcome, the programme was endorsed and implemented across the state of Victoria in January 2018.

**Keywords:** telehealth; teledentistry; rural health; Australia

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### Introduction

The population of Australia is 25 million with about two-thirds of its population concentrated in largely coastal or geographically peripheral cities making it one of the most urbanised nations in the world.<sup>1</sup> Australia is broadly divided into four different geographic-demographic regions – metropolitan, regional, rural and remote.<sup>2</sup> The vast proportion of the population lives in metropolitan and regional centres, with 70% of the Australian population concentrated in the south-eastern states and on the coastal fringe, with a more sparse distribution of population in rural and remote areas.<sup>3</sup>

As with most developed countries, Australia has an ageing population. According to the latest WHO data published in 2018 life expectancy in Australia for males is 81 years of age, females at 84.8 years.<sup>4</sup> Life expectancy for the Aboriginal and Torres Strait Islander population is estimated to be about 10 years lower.<sup>5</sup> On the whole Australians are living longer and healthier lives, but the main challenges remain growing prevalence of chronic disease, obesity, and mental health issues.<sup>6</sup>

Rural Australia has a higher proportion of older people compared to their metropolitan counterparts.<sup>7</sup> Australians living in rural and remote areas tend to have shorter lives, higher levels of disease and injury and poorer access to health services compared to people living in metropolitan areas.<sup>8</sup> Lack of adequate public transport can also contribute to poorer health outcomes.<sup>9</sup>

This population distribution makes equitable service provision to rural and remote communities a real challenge for all health services and particularly for specialist services. Access however is not simply a geographic challenge, as mobility or disability can also act as a barrier to access.

In this paper we will describe the use of information and telecommunication technologies (ICT) to provide oral health care from an Australian perspective. This paper is organised in three parts. The first part provides a brief description of the Australian health system, including the oral health care system. The second part presents an overview of teledentistry in the Australian context and specifically focuses on a programme in the Australian state of Victoria. The last part includes insights from the author and highlights lessons gained in teledentistry from which to derive

recommendations for appropriate policies suitable to oral health care programmes.

### **The Australian Health System**

The Australian health system has evolved into a complex mix of private/public service provision and funding, involving government investment and the private sector.<sup>10</sup> The Australian Government contributes to medical expenses and hospital care through a scheme called Medicare. Medicare pays for most of the costs of visits to general medical practitioners, radiology and pathology services, and public hospital care. Medicare historically has not been involved in the provision of oral health services, with the exception of a child dental program for eligible families, the Child Dental Benefit Schedule.<sup>11</sup>

In 2012–13, individuals were the greatest contributor of funds toward total dental expenditure, paying directly out of pocket for 57% of dental costs.<sup>12</sup> Oral health care services in Australia are provided, overwhelmingly by private dentists, in a private, fee-for-service market.<sup>13</sup> Many Australians have private health insurance to defray some of the costs of private dental treatment.

Public dental services have traditionally been provided at the State level, for disadvantaged patients normally defined as those receiving government benefits and who are eligible for a government Health Care Card.<sup>14</sup> Approximately one-third of the population is considered eligible for public dental care.<sup>15</sup> Community Health Centres provide services to eligible patients who generally pay a small co-payment, with treatment heavily subsidised.

Public oral health care clinics are often located in regional centres and may be associated with a public hospital or community health clinics. In Victoria, public dental services receive capped government funding from State governments and as a consequence meet the demand of about 25% of the total eligible population.

### **Oral Health**

Oral diseases are among the most common health problems experienced by Australians with more than half of all children and almost all adults affected by tooth decay.<sup>12</sup> People in low-income households experience substantially poorer oral health and the impacts on their quality of life when compared with those on high-incomes.<sup>16</sup>

### **Workforce profiles**

Under the *Health Practitioner Regulation National Law Act 2009*, the registration categories under which a clinician can practise in Australia include dentists, dental therapists, dental hygienists, and oral health therapists.<sup>17</sup> Nationally in 2013 the majority of dentists (90%) were general dentists with the remainder being specialists. Approximately 83% of dentists in Australia work solely in the private sector, with 10.5% working in the public sector and 6.6% working across both sectors.<sup>18</sup>

Across geographic demographic regions, major cities had the highest number per 100,000 populations of practising

dentists (63.1) and remote areas had the lowest (25.7).<sup>19</sup> The majority of dental specialists were employed in major cities (89.1%) and in private practice (75.0%).<sup>19</sup> Hence as health inequity increases for individuals who cannot afford private care and who live outside of metropolitan and regional centres, the access to trained oral health professionals, especially specialist care, decreases.

### **Victoria and Teledentistry**

The state of Victoria is located in the south-eastern corner of the Australian continent and has a population of over 6 million people.<sup>20</sup> Public dental services in Victoria are predominantly funded by the Victorian state government, with some additional funding for children and adults invested by the Commonwealth Government.

The community dental programme in Victoria is a partnership between the State Government, Dental Health Services Victoria (DHSV), and 52 community dental clinics. DHSV is the State's leading public oral health agency, promoting oral health, purchasing services, conducting oral health research and providing care to eligible Victorians.

DHSV provides dental health services through the Royal Dental Hospital Melbourne (RDHM). RDHM provides general, specialist and [emergency dental care](#) to all eligible Victorians. Travel from the most remote Victorian clinics can be up to 12 hour return journey. Therefore there are significant travel, accommodation, absence from employment, child care and other costs related to attending a face-to-face appointment for rural Victorians.

### **Teledentistry Programme**

An initial proof-of-concept study of teledentistry in Victoria was completed in 2012.<sup>21</sup> In 2014 further field testing of projects and modalities were undertaken. These were aimed at alleviating serious workforce shortages in rural communities and residential age-care facilities.<sup>22,23</sup> Across Eastern Australia, initiatives in teledentistry are in use in NSW, Victoria and Queensland.<sup>24</sup>

The Victorian Department of Health and Human Services funded DHSV in January 2015 to launch a telehealth programme. The aim of the programme was for teledentistry to enable patients to receive specialist advice and/or advanced care through a clinical alliance between dentists at DHSV funded community dental clinics and RDHM specialist staff. A partnership between the patient, the dentist and RDHM specialist staff facilitated the development of patient-centred clinical pathways to deliver the right care, by the right person, in the right place.

The objectives of the teledentistry pilot project were to develop and identify:

- care pathways for the delivery of specialist dental services to eligible patients
- sustainable care plans which deliver services to communities with access issues
- a peer education program that increases and maintains the capacity of community dentists to work with

RDHM specialist services

- the installation of the most appropriate intra oral cameras, computer hardware and software and viewing equipment.

A referral to RDHM is generated when a community dentist encounters a pathology or intractable issue which is either outside of their scope of practice or they lack confidence or experience to manage autonomously. Under the traditional model of care there are ten stages from a referral to when the patient attends their first Specialist consultation at RDHM (Figure 1) and at times the wait-time can be long. It was evident that extended periods spent on waitlists can mean a deterioration of the patients' condition, making interventions potentially more complex and pose higher risk by the time a specialist appointment is secured. The same process using the teledentistry care pathway is a four stage process which is typically completed within a month from referral.

DHSV launched its pilot project on 3<sup>rd</sup> June 2015 with four Community Dental sites. An operational framework was developed and ensured that:

- equipment was fit for purpose
- the videoconferencing platform supported the clinical session

- a funding structure ensured sustainability beyond the pilot project
- compliance with all medico-legal aspects of delivering care was met

The specialties trialled during the pilot project were Oral Medicine, Oral Surgery, Endodontics and Orthodontics. An action based research framework was adopted so that improvements to the operational framework and clinical pathways could be made throughout the project.

Teledentistry enabled specialist care to become part of a patient's integrated care plan driven by the local dentist, in consultation with the patient and provided within the community dental clinic setting.

As part of the ongoing evaluation, patient and clinician surveys were collected post consultation. All feedback was overwhelmingly positive with only minor changes being recommended. From January 2018 the programme was extended to all community dental agencies state-wide. By October 2018, through an expression of interest process, purchase of equipment and provision of defined skills training to participating community dentist, over 70% of community dental agencies state-wide (both metropolitan and rural) had elected to participate. The metropolitan and rural telemedicine locations are shown in Figures 2 and 3.

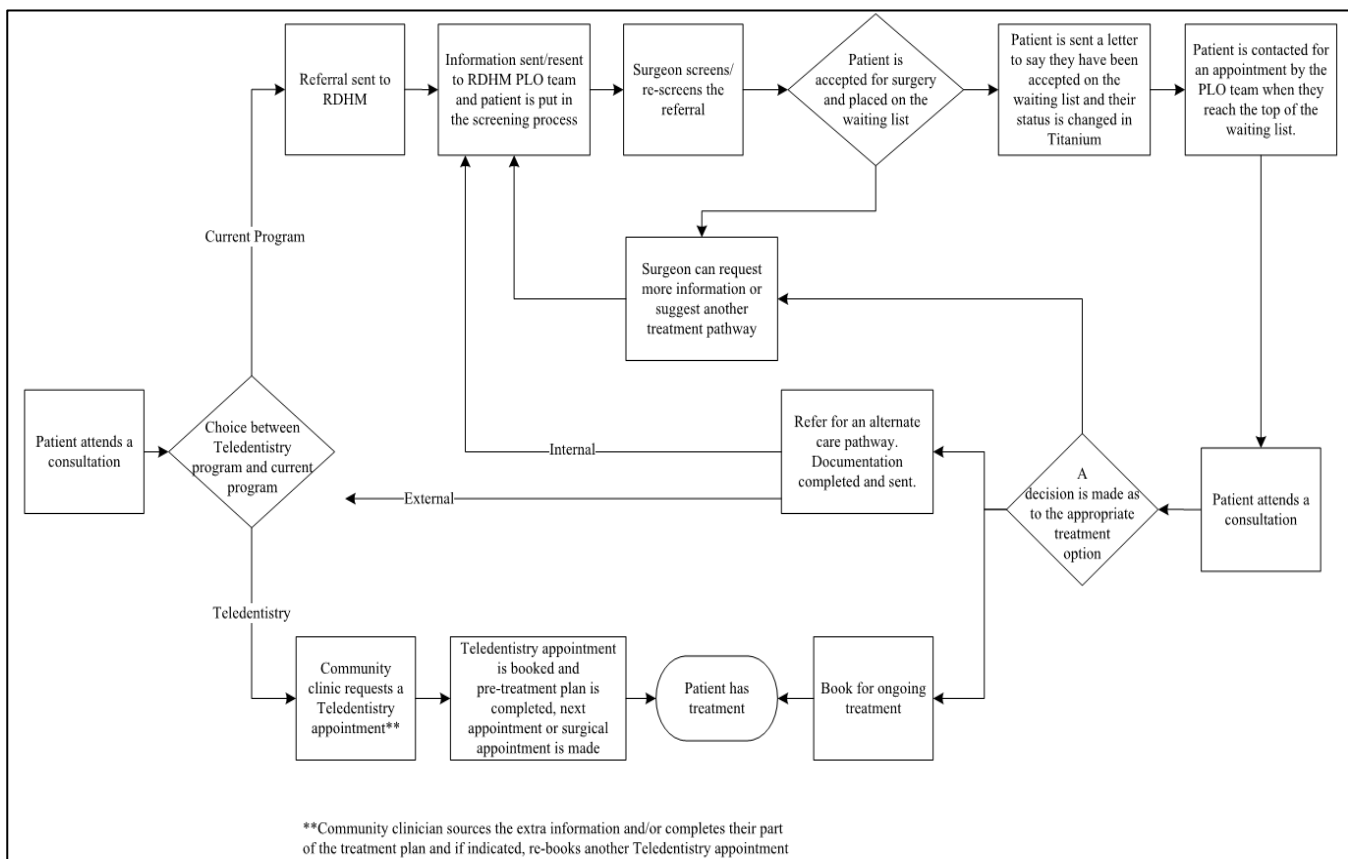


Figure 1. Steps in patient treatment Traditional vs. Teledentistry Programme.



**Figure 2.** Metropolitan teledentistry locations.



**Figure 3.** Rural teledentistry locations in Victoria.

**Technological platform and equipment**

The following criteria were used in the selection of equipment and platform to support the programme:

- simple to use
- ease of access
- utilises familiar technology;
- requires minimal change to process/practice
- delivers instant connectivity
- images are of high acuity.

In addition, DHSV developed an IT sharing portal on which to upload images and the ability to link these with an episode of care to ensure medico-legal integrity, security and compliance. At the end of the pilot, and based on these criteria, Microsoft Skype for Business was selected as the web conference provider and the clinical staff selected the Carestream 1200 and 1500 intraoral cameras. (Figure 4)

For Oral Medicine there was the requirement to invest in quality digital images to ensure sound clinical decision making when examining mucosa. Hence DHSV also invested in digital cameras, selecting the Canon EOS 200D plus Canon EF 100mm F2.8 lens (Figure 5). A range of digital cameras were tested and this model provided the best acuity and highest scoring in confidence from Oral Medicine specialists in terms of reliability for making clinical diagnosis and subsequent treatment planning.



**Figure 4.** Carestream Intra-oral Camera



**Figure 5.** DSLR Camera.

**Funding guidelines**

From 1<sup>st</sup> July 2011, Medicare rebates and financial incentives were made available for telehealth under the Connecting Health Services with the Future initiative.<sup>25</sup> For the purpose of the pilot, DHSV defined a teledentistry session as one in which the patient receives dental services delivered locally by a practitioner receiving advice and clinical support from a specialist via a video link. The patient must be present when care is provided. Although the technology is used for the purpose of a second opinion, when the patient is not present teledentistry reimbursement cannot, at this time, be claimed for this activity.

Clinical support is defined as actively contributing clinical input to the Teledentistry session. This involves reviewing a dental history and images, performing a guided oral examination or providing treatment advice and supervision. The Specialist providing secondary consultation advice and support can claim an oral examination item number for reimbursement. The treating dentist can claim all the same item numbers associated with that session, examination and treatment that they would claim during a traditional face-to-face session.

**Benefits**

The ability for patients to access care in their own communities is a clear benefit of the programme. In a traditional referral to specialist care, treatment is delivered in silos and the patient is usually left to navigate the pathway independently. Teledentistry allowed for the creation of a model of care that is patient centred, by ensuring the integration of concurrent treatment planning with the community dentist, the specialist and in direct consultation

with the patient at the same session.

Another benefit to emerge from the pilot was the relationship fostered between the specialist and the community dentist. Teledentistry gives the regional clinicians direct access to mentoring and upskilling, supporting them to treat more complex cases in the community and thus, over time, reducing the burden on the RDHM specialist clinics and wait-times.

**Constraints**

The constraints identified during the trial were mainly operational. Those that we have been able to mitigate to date, include developing a secure way to view radiological and digital images, sourcing reliable digital imaging of oral mucosa for diagnosis, ensuring the patient was able to participate in the consultation by purchase of additional monitors. Those issues which still require a solution include billing for a secondary consultation when the patient is not present (store-forward methodology) and how to incorporate interpreters into the consultation.

**Future**

Teledentistry is a very new initiative in Victoria and work is needed to embed it into standard practice and as a part of the model of care. At this ‘innovator’ stage only early adopters have been engaged as, by necessity, the technology introduces the possibility of a new way of doing things, but also poses a challenge for those who lack technical expertise or well-supported digital solutions.

The potential to embed teledentistry as part of the standard model of care will require engagement of those less technically savvy. Some of the strategies being considered to harness this in 2019 are the creation of regional champions to promote the service modality; transitioning the treatment focus to include professional development and creating an expert network; and as participating community dentists grow in confidence, moving from a live video conference to a store-forward method making provision for prompter specialist review, and faster care and referral (especially in the instance of urgent cases and early detection of oral cancers).

**Conclusion**

In the author’s experience the technology and virtual mode of treatment have been embraced by both patients and clinicians. While the technology was suited across all specialties, it is reliant on the specialist being a good communicator, and someone who is able to build rapport and to engender confidence in the remote dentist receiving instruction and advice. The outcome and experience for the patient is enhanced if the remote dentist is confident in using the equipment and in doing procedural work. This confidence is something which is nurtured over time and it is important that the community dentist feels that they are working in a supported learning environment. One of the unexpected consequences of this model of care is the ability to include

the patient as an active part of the consultation, who can contribute in the discussion relating to their care and treatment planning.

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**Corresponding author:**

*Jennifer Baker*  
*Dental Health Services Victoria*  
*Melbourne*  
*Victoria*  
*Australia 3001*  
*Email: [e-Mail: jennifer.baker@dhsv.org.au](mailto:jennifer.baker@dhsv.org.au)*

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