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## Contents

1  Introduction  
2  Description of Facilities  
   2.1  Services provided  
   2.2  Facility design  
   2.3  Target population  
   2.4  Care offered  
3  Planning Assumptions  
   3.1  Role delineation and level of service  
   3.2  Hours of operation  
   3.3  Type of facility  
   3.4  Alternative contract arrangements  
   3.5  Calculating the number of treatment chairs required  
4  Operational Policies  
   4.1  Accessing services  
   4.2  Patient management and flow  
   4.3  Anaesthesia  
   4.4  Medical emergencies and patient recovery  
   4.5  Instrument reprocessing  
   4.6  Radiology  
   4.7  Dental records  
   4.8  Supplies  
   4.9  Waste disposal / mercury  
   4.10  Laboratory  
   4.11  Information and communication technology (ICT)  
5  Facility Location  
6  Functional Areas and Design  
   6.1  Functional areas  
   6.2  Shared or common areas  
   6.3  Dental surgery design  
   6.4  Dental surgery layout  
7  Support Areas  
   7.1  Laboratory  
   7.2  X-ray processing room  
   7.3  Staff offices and amenities  
   7.4  Information technology  
   7.5  Car parking  


8 Infection Control
  8.1 Environmental
  8.2 Personal hygiene and protection
  8.3 Instrument reprocessing area

9 Health and Safety
  9.1 Overview
  9.2 Sole operator

10 Building Services and Environmental Design
  10.1 Electrical systems
  10.2 Patient privacy
  10.3 Security
  10.4 Acoustics
  10.5 Lighting
  10.6 Access and mobility
  10.7 Information and communication technology (ICT)
  10.8 Radiation screening
  10.9 Heating, ventilation and air conditioning
  10.10 Water
  10.11 Medical gases
  10.12 Plant room and supply lines
  10.13 Interior finishes
  10.14 Dental surgery joinery
  10.15 Signage
  10.16 Fire requirements

11 Mobile Dental Units
  11.1 Overview
  11.2 Planning considerations
  11.3 Policy and practice considerations

12 Dental Facility Upgrades and Refurbishments

13 Components of a Unit
  13.1 Standard components
  13.2 Non-standard components
  13.3 Dental surgery
  13.4 Instrument reprocessing room
  13.5 Plant room
  13.6 Dental laboratory

14 Dental Surgery Equipment

15 Information and Communication Technology (ICT)
References and Further Reading

1. New Zealand 37
2. Australia 39

Appendices

Appendix 1: Policy Framework for this Guideline 40
Appendix 2: Role Delineation and Organisation of Dental Care 41
Appendix 3: Schedule of Accommodation 44
Appendix 4: Example Floor Plans 45
Appendix 5: Quantity Surveyor Costs 46

List of Tables

Table 1: Essential items of dental equipment where installation must be considered at the design and layout stage 34
Table 2: Clinical equipment for consideration and installation requirements 35
Table 3: Items to consider when planning an oral health facility 36
Table 4: Service characteristics essential for Level 1 service 41
Table 5: Specific Level 2 characteristics 42
Table 6: Specific Level 3 characteristics 42
Table 7: Relationship between models of care and facility types 43
1 Introduction

Establishing a new public oral health facility – whether it be a unit in a hospital, a community dental clinic or a mobile unit – requires careful planning. A range of factors will influence how well the facility functions, in terms of providing a high-quality service in a safe environment. This Oral Health Facility Guideline has been developed to provide best practice guidance on how to ensure this happens.

The Guideline will be of most use to:

- health service personnel involved in the planning and design of oral health facilities
- architects, planners, engineers and others who are engaged to plan and design oral health facilities
- personnel whose role it is to oversee and monitor such projects.

Although the levels of service provided will vary across District Health Boards (DHBs), all provide oral health services to similar populations of eligible clients within the public health sector, and their aims and objectives are similar, with the emphasis on prevention. This Guideline is aimed at ensuring a consistent approach to the design of publicly funded oral health facilities to meet both the needs of the patients, and also the needs of the staff who work in the public sector.

Before any facility planning occurs, an Oral Health Service Plan for the District Health Board (DHB) region should have been developed. This will detail the level of service to be provided, the number of dental chairs and workforce requirements, and the type of oral health facility required. It is essential that community oral health facilities are planned within the wider strategic planning for DHB oral health services, and within Ministry of Health guidelines and requirements for service coverage.¹

Although standards and requirements will change over time, non-compliance with this Guideline when redeveloping or reinvesting in facilities will need to be justified to gain approval for the proposed non-compliant components.

¹ For an indication of the policy context within which this document was developed, see Appendix 1.
2 Description of Facilities

2.1 Services provided
Most publicly funded oral health facilities will provide predominantly community-based outpatient services, but there may need to be some inpatient access in hospital-based units. Dentists may need access to operating or day procedure facilities for dental and oral surgery that cannot be undertaken in a community facility, particularly for children and people with special needs. However, this Guideline focuses on primary care delivered from community-based oral health facilities.

Oral health facilities may support some or all of the following services:

- dental therapy services for children and adolescents
- general and emergency dental services for all ages
- specialist services – paediatric dentistry, oral surgery, orthodontics, periodontics, oral medicine, prosthodontics, endodontics
- teaching and training
- community education programmes.

An example Schedule of Accommodation is set out in Appendix 3 of this Guideline. The schedule is not intended to be prescriptive, but rather aims to provide the basis on which an oral health facility suitable for its stated purpose can be developed. In short, it provides the information necessary to plan and design oral health facilities of varying sizes and complexity.

Sample layout drawings for one, two, four and six chair facilities and costs are provided in Appendix 3. DHBs will be required to commission detailed drawings for their agreed facilities, however it should be noted that there should be an opportunity for a collaborative approach for procurement of final facility drawings.

2.2 Facility design
The Oral Health Facility Design Guidelines produced by Queensland Health (2004) identifies some of the issues which should be taken into account when planning a facility in New Zealand as many of the issues experienced in Queensland are replicated in the New Zealand oral health sector. We therefore think that the Queensland guideline is relevant and make reference to their suggested design criteria below.

Oral health facilities should support the effective and efficient provision of oral health services to eligible clients. In order to do this, the following outcomes should be achieved by facility designs:

- capacity to comply with relevant laws, by-laws and standards
- safe, hygienic buildings
- capacity to achieve accreditation to an appropriate level
- innovative, stimulating and responsive environment for patients and staff
- flexibility to allow for future change
• maximum energy efficiency
• accessibility for disabled persons
• capacity to support the development and retention of high quality staff to meet the needs of patients.

2.3 Target population
The target population for publicly funded oral health facilities includes:
• pre-school and school-aged children and adolescents
• people with special needs who are unable to access dental care from private dental practices
• adults on low incomes who are entitled to a Community Services Card
• communities with high needs
• clients in remote and rural areas.

2.4 Care offered
The care most commonly offered in community-based facilities includes:
• oral examination and diagnosis (including radiographic diagnosis)
• preventive care, including fissure sealing and fluoride applications
• general dental care, including restorative dental care at a non-specialist level
• extraction of teeth and oral surgery
• treatment of periodontal disease
• referral of patients (as required).

Community-based dental facilities may also be used to provide dental services beyond those traditionally offered in school-based facilities, such as:
• fitting and adjusting dentures and removable prosthetic care
• specialist care (eg, orthodontic, outpatient oral surgery or paediatric dentist treatment).

Facilities should be planned bearing in mind the extended scopes of practice that may be offered by a dental team – including dentists, dental therapists, dental hygienists or clinical dental technicians – in the context of each DHB’s oral health service planning.\(^2\)
Community-based dental facilities may also be the base or hub for outreach health promotion and community link services offered by the oral health service or allied health providers. Suitable accommodation will be required for these staff if they are part of the oral health service plans.

In hospital-based units, services may be provided to patients requiring specialist treatment or advice beyond the scope for general dental practice.

\(^2\) Refer to the Dental Council of New Zealand, detailed scopes of practice, 2003.
3 Planning Assumptions

3.1 Role delineation and level of service

Role delineation is a process that determines the facilities, staff profile and other requirements that ensure oral health services are provided at an appropriate level and in a facility that is appropriately supported. The level of service describes the complexity of the clinical activity undertaken by that service, and is chiefly determined by the presence of dental and other health care personnel who hold qualifications compatible with the defined level of care.

This Guideline recommends a role delineation and organisation system with a hierarchy of levels of care, from less complex to more complex, with appropriate consideration given to local needs, resources, cultural diversity and geographical constraints. It is based on the American Society of Anaesthesiologists (ASA) Physical Status Classification System, and considers the physical states of the patients to be managed and the services to be delivered from the facility to define four levels of facility, as follows.

- Level 1: access is limited to examination and preventive oral health care for normal healthy patients with mild systemic disease, delivered from a fixed (purpose- and non-purpose built) or mobile dental facility in a community setting.
- Level 2: examination and treatment oral health services for normal healthy patients with mild systemic disease are delivered from fixed or mobile community facilities.
- Level 3: examination and treatment oral health services, with the ability to offer sedation services for normal healthy patients or patients with mild systemic disease, are delivered from community- or hospital-based facilities.
- Level 4: examination and treatment services, with the ability to offer sedation services for normal healthy patients and examination and treatment services for patients with mild or severe systemic disease, are delivered from a hospital-based facility.

For more detail on role delineation and level of service, see Appendix 2.

3.2 Hours of operation

Oral health facilities will usually operate during business hours, Monday to Friday. However, some may operate outside these hours and this may have particular implications for access, security and safety of practice that need to be considered during the planning and design stages.

3.3 Type of facility

Offering a community-based and population-focused oral health service requires a mixture of oral health facilities appropriate to the needs of each community and the needs of the population. It is anticipated that community oral health facilities will be either:

- stand-alone and community-based in a metropolitan or rural area
• community-based and part of a school, community health centre or other multi-purpose community-based centre
• a mobile unit in an outreach location made available for dental care
• a hospital-based unit.

The District Health Board New Zealand (DHBNZ) School Dental Service Review Final Report, December 2004 proposed reconfiguring oral health facilities based on the ‘hub and spoke’ model. This configuration usually consists of a strategically sited ‘hub’ clinic, with mobile clinics constituting the ‘spokes’. A hub clinic will generally accommodate two, four or six dental chairs, although in high-density communities or where training facilities are required, larger clinics accommodating eight or more chairs are a potential option.

For the purpose of the following discussion a distinction is made between fixed, mobile and hospital facilities.

Fixed community-based facility

We anticipate that a full range of dental examination and treatment services would be provided from a fixed community-based facility; which is to say, facilities delivering at least Level 2 services and offering ‘hub’ services in a hub-and-spoke model.

Community-based facilities may be developed at many different locations, including school-based clinics, stand-alone facilities within or close to community hub locations, and co-located as part of community health centres or other community-based centres.

Mobile facility

Mobile facilities would frequently be used to offer ‘spoke’ services in a hub-and-spoke model. There are a number of trailer and self-propelled/self-drive mobile dental unit options. Before embarking on the construction and use of mobile dental facilities, however, the purpose of the unit must be clearly identified, including the population to be served, the level of service (examination only or full treatment), the service sites to be used, and the workforce mix.

Single-chair mobile units may be developed for either a comprehensive examination and preventive service or a full treatment service. Mobile units with more than one chair would generally be recommended for full treatment services in preference to an examination and preventive service.

Hospital-based facility

The main role of hospital-based dental facilities is to provide outpatient care. However, services are also provided to inpatients who require urgent dental care or dental care as part of an inpatient admission. Not all hospitals are expected to have a dental unit, but DHBs must make provision for dental care for inpatients, and for outpatients requiring dental care that cannot reasonably be provided from community-based facilities (including the private sector).
3.4 Alternative contract arrangements

District Health Boards may also want to consider utilising private dental practice providers, or investing in the community-based facilities of other primary health care providers (eg, primary health organisations or Māori oral health providers). Publicly funded dental facilities operated in conjunction with a DHB-funded contract would be expected to conform to the standards outlined in this Guideline. Contracting with private dental practices should be considered, particularly where investment in public dental facilities would not lead to a productive facility, and where access to an appropriate workforce or service coverage may be better achieved in conjunction with a private dental practice provider.

3.5 Calculating the number of treatment chairs required

The decision whether to invest in a public dental facility and the size of that facility is affected by many factors, and this Guideline is provided to assist in planning a facility to ensure it meets the needs of a particular population. DHBs should consider the productivity anticipated from new clinical facilities, and this should be based on the productivity anticipated from the dental chair.

But while dental chair productivity is important, it is not the only factor. Other considerations are the demand for dental services, the level of oral health need in that population, and the proportion of the overall service that it is anticipated will be delivered from the publicly funded facility.

The following formula may be used to assess the number of chairs required. Based on the total number of days available, calculate the actual hours available by subtracting the number of non-clinical hours from the total hours available. Then, assuming half-hour appointments, multiply the actual number of available hours by two. This gives the number of patient appointments per year each chair can support. This is illustrated in the following example, which works through the steps, based on a number of assumptions.

1. Assume total days available = 47 weeks x 5 days = 235 days.
2. Therefore, total hours available = 235 days x 8 hours/day = 1880 hours.
   (This excludes public holidays and an annual closedown period = 5 weeks.)

To calculate the non-clinical time:

3. Assume chairside cleaning allowance = one hour/day (half hour between and after sessions = 235 hours.
4. Assume 80% occupancy = 376 hours (this allows for meetings, training and allowance for managing the work patterns of part-time staff, etc).
5. Therefore, total non-clinical hours = 611.
6. Available hours = 1880 hours per annum – 611 (total non-clinical) = 1269 hours per annum (or 5.4 hours/day).
7. Assume a predicted 12,000 appointments per year.
8. Based on half-hour appointments, each dental chair has the capacity to support 11 patient appointments per day, or 2585 patient appointments per year.
9. Therefore, 12,000 appointments per year require 4.6 chairs.

District Health Boards should carefully consider the critical assumptions in this planning (eg, 30-minute appointments, number of days available) and assess whether differing productivity and efficiency assumptions are more realistic for the DHBs actual situation.

On the basis of this information, DHBs need to consider full-time equivalent output/productivity levels, appointment not kept rates (which may be higher in the public sector), and facility configuration options to achieve an optimum staffing mix and maximum efficiencies.
4 Operational Policies

There are a wide range of national, regional and local regulations and policies relevant to the planning and delivery of oral health services and facilities. For details on these, refer to the ‘References and Further Reading’ at the back of this Guideline.

4.1 Accessing services

Child and adolescent patients generally access dental services through an enrolment procedure, which may include referral from other health care providers. Ongoing care is provided, including a recall system that must be managed by the provider.

Access by adults may involve self-referral or referral from other health care providers, including private practice dentists, general medical practitioners, medical specialists, dental therapists and hospital-based clinicians. Adults often receive episodic periods of dental care, with relatively few receiving regular dental care through recall arranged by public dental providers.

4.2 Patient management and flow

Patients attending the dental unit will report to reception, where appointments will be made or confirmed, and personal details taken or previous records retrieved. After this, patients will be directed to the waiting area.

Patients may be accompanied by support people, who may include parents and caregivers, whānau and other children. Consideration must be given to providing facilities with sufficient room to accommodate all support people. When the dentist is ready for them, patients move from the waiting area to the treatment areas.

The design of the facility must allow easy access to clinics for patients, including those with disabilities. The unit must also be designed to prevent unauthorised access from the reception / waiting area into the treatment and sterilisation area, and from the treatment area to the sterilisation area. This means creating a barrier by way of a door.

4.3 Anaesthesia

This Guideline does not apply to the provision of day surgery under general anaesthesia from a day procedure unit or operating suite. Dental care provided in the facilities described in this document will generally be undertaken under local anaesthesia. Patients needing a higher level of care, such as Level 3 services or general anaesthesia (mainly children and adults with special needs) will be referred to a suitable provider, and may be placed on sessional lists depending on the level of service and anaesthetic policies of the facility. However, if the facility is to provide sedation services, equipment and staffing must comply with the Dental Council of New Zealand Code of Practice on Sedation.3

3 Dental Council of New Zealand: Conscious Sedation for Dental Procedures; April 2006.
4.4 Medical emergencies and patient recovery

Facilities for managing medical emergencies must be appropriate to the agreed level of care to be provided by the facility and within the scope of practice relevant to the operators. Facilities, staffing and space must comply with the codes confirmed for each dental clinician.

4.5 Instrument reprocessing

We anticipate that the majority of reprocessing of re-usable surgical instruments will be provided on-site in the dental facility.

On-site instrument reprocessing and sterilisation

It is mandatory for facilities providing on-site instrument reprocessing to have a dedicated area to support this process. The following standards are specific to instrument reprocessing:

- AS/NZ 4815:2006
- AS/NZ 4187:2003
- Dental Council of New Zealand Code of Practice: Control of Cross Infection in Dental Practice.

(See also section 8: Infection Control.)

Off-site instrument reprocessing and sterilisation

Contaminated instruments and equipment could be sent to a central sterile supply (CSS) or a regional off-site provider for sterilisation. On the one hand this would necessitate a significant increase in the numbers of instruments, increased support for transporting instruments between the two sites, and an increase in the workload of the CSS. On the other hand this option may reduce the operational and infrastructure outlay, particularly at small facilities, and increase the service provider’s ability to apply, monitor and improve quality standards. Providers should complete a cost–benefit analysis of the available options in relation to their service plan.

If off-site instrument reprocessing and sterilisation are used, the facility will still require appropriate space for receiving and storing instruments and equipment, separating waste and reusable items, and disposing of and/or packing contaminated goods.

4.6 Radiology

There must be the capacity for individual or shared intra-oral dental radiography facilities in all oral health units. Shared facilities must address privacy and safety issues. Facilities for processing film should be readily available, and may be carried out in the unit or outsourced. Services should also consider the costs and benefits of digital radiography.

Refer to Dental Council of New Zealand Codes of Practice: Emergencies in Dental Practice.
Orthopantomogram\(^5\) (OPG) and other extra-oral radiography facilities will only be established in large, hospital-based units. The option to outsource dental radiography from radiology departments should be considered.

All equipment must be tested for electrical and radiological safety before being installed. In the design stage it is essential to address wall shielding and to create controlled areas that ensure operator exposure is managed within the National Radiation Laboratory guidelines.\(^6\) (See also section 10.8: Radiation screening.)

4.7 Dental records

Current dental records should be stored adjacent to reception, using fixed metal shelving or a compactus system to allow administrative staff easy access. Archive space for non-current records may be off-site, but health records must be accessible within a reasonable timeframe.

Health records must be retained for the minimum period required in the Health (Retention of Health Information) Regulations 1996. Regulation 5 states:

> In these regulations the minimum retention period in relation to health information which relates to an identifiable individual, means a period of 10 years beginning after the date on which the provider provided health services or disability services, or both, to that individual.

Individual DHB policies may require longer periods of retention and should be considered when planning the facility.

Electronic records are an increasingly used alternative, but they must be stored and backed up appropriately.\(^7\)

4.8 Supplies

Relatively few dental supplies are a standard part of a hospital’s main supply inventory. Most items will be ordered by and stored within the dental facility. We anticipate that items available on the hospital’s stores inventory will be drawn on an imprest system.

There should be a designated goods delivery entry, with or without a loading dock. Larger units acting as a ‘hub’ for smaller clinics in the area will require additional storage space, and a packing area with bench space to prepare materials for redistribution.

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\(^5\) An Orthopantomogram, or OPG, is a special type of x-ray looking at the lower face that displays both the upper and lower teeth in a long flat line.

\(^6\) Refer to: National Radiation Laboratory C7 – Code of Safe Practice for the Use of X-rays in Dentistry, 1991.

\(^7\) Refer also to: NZS 8153:2002, health records, local DHB policy, and Dental Council of New Zealand Code of Practice: Patient Information and Records.
4.9 Waste disposal / mercury
Dental facilities generate a number of waste products that have the potential to be discharged to the waste-water system through dental vacuum suction systems. Mercury discharge is a significant concern, and dental clinics are recognised as potential contributors to mercury contamination of the environment. Project staff should refer to their relevant local authority for guidelines on disposing of both liquid and solid wastes, back-flow prevention and waste-water disposal.8

4.10 Laboratory
The need to include a dental laboratory in an oral health facility will depend on the age of the main patient group and the services to be provided. Options include outsourcing dental technology services or providing an ‘in-house’ service. Consider providing a minor prosthetic adjustment area even if an in-house laboratory is not required.

The management of noise and dust, and infection control, must be considered at the facility design stage.

4.11 Information and communication technology (ICT)
Planning ICT systems to support clinical and operational activities is an essential part of the design and configuration of any facility. The number, size and position of workstations, including desk space and computers, will be determined by the facility’s functions and should be supported by an ergonomic assessment in relation to the facility’s staff.

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8 Refer to: Standards NZ Waste Management Standard (NZS 4304: 2002). Note that this standard is due for review. Environmental issues (eg, management of contaminated waste and developing solutions) may result in additional requirements to the existing standard New Zealand Dental Association Practice Guidelines.
5 Facility Location

The ideal is a ground-floor location for ease of access by high volumes of outpatients. If the facility is in an upper-level floor, access by escalator is required as well as stair access.

If positioned in school grounds, the facility should be easily accessed, with minimal or no disruption caused to the school, by children, adolescents and members of the public who may attend the facility but not have a relationship with the school. Locating fixed clinics and pads for mobile units, on the school boundary is therefore desirable.
6 Functional Areas and Design

6.1 Functional areas
The functional areas of an oral health facility will comprise:
- entry / reception / waiting
- clinical treatment areas (surgeries)
- plant room
- store room
- x-ray development
- sterilising room
- staff offices
- staff amenities
- cleaner’s room.

6.2 Shared or common areas
The requirements for common areas will depend on the level of service and the type of facility provided. The common areas will primarily be entry, reception, waiting and toilet facilities for patients, plus support areas for staff (staff room, tea and coffee making facilities and bathroom facilities).

Access to these areas must be available at all times the service is operating. When facilities are located in a school, wider health facility or other multi-purpose location (eg, a community centre), agreements will need to be reached between health services and school boards or other facility operators to ensure access to common areas when dental services are in operation. However, appropriately negotiating these arrangements may substantially decrease the costs associated with designing, building or refurbishing facilities and utilising shared area agreements should be considered where possible.

Entry / waiting
This area is ideally situated where it has easy access from the parking areas for outpatients. The design of the entrance will depend on whether the unit is accessed from inside a building or directly from outside. In the latter instance, an airlock will be required. Entry to the clinic must allow easy barrier-free access for people with disabilities, including people in wheelchairs, and must comply with the New Zealand Building Standards. Disability access should include space for a wheelchair parking bay.

There should be a dedicated waiting area that allows, as a minimum, the same number of places as there are surgeries, plus a seat for a supporter (particularly for parents, who are encouraged to be present when their child is treated). A children’s play area may be located adjacent to the main waiting area.
Reception
Reception will accommodate one or two staff depending on the size of the unit. The counter must have one wheelchair-accessible section. It is recommended that the reception area enable the collection and management of account payments. A duress alarm may be provided.

Patient and visitor amenities
Patients and their supporters should have access to – either in the facility or in close proximity – a toilet, including hand-washing, with disabled access.

6.3 Dental surgery design

Single-room: examination (Level 1 facility)
Single-room design for examination incorporates all services and equipment required for the assessment and preventive care of one patient, and is appropriate when:
- dental equipment is limited to a single dental chair, along with light and compressed air
- an existing space lends itself to this form of design
- privacy for patients is required.

Single-room: treatment (Level 2 and above facility)
Single-room design for Level 2 treatment incorporates all services and equipment required for the assessment and treatment of one patient. It is recommended that at least two single room surgeries be provided in a facility. Privacy for patients and wheelchair access is required.

Open-plan design (Level 2 and above facility)
In an open-plan surgery design, surgeries, each accommodating one dental unit are arranged in pairs with shared hand-washing, x-ray and storage facilities located between them and separated from each other with partial height partitions. The design must ensure privacy from the circulation corridor. Management of x-rays and patient privacy will need careful consideration.

The advantages of an open-plan design include:
- space efficiency
- cost efficiencies through shared resources (eg, dental assistants, x-ray units)
- an environment for teaching and supervising clinicians.
Multiple room surgeries

A multiple room surgery is recommended for proposed community clinics in urban areas or centres of sufficient population. These facilities may include a combination of single-room dental surgeries accommodating one dental unit and/or surgeries with an open-plan design accommodating two dental units. The final configuration and number of surgeries and dental units will depend on the population served and the facility’s functions (e.g., clinical training). Multi-room facilities could accommodate from four up to eight dental chairs.

Larger community-based facilities with multi-room surgeries have the advantage of offering the opportunity to:

- engage a dental team consisting of a dentist, dental therapists, dental assistants and administration/reception staff
- improve access to services through increased open hours
- offer training programmes for health professionals and support personnel.

6.4 Dental surgery layout

A typical dental surgery has the dental unit positioned close to the centre of the room or cubicle, with the foot of the chair facing away from the entry. This is the preferred orientation of the unit because it addresses both privacy and modesty concerns for patients, and ensures easy staff movement in and out of the room and a ready means of exit if a patient becomes aggressive.

The dentist or dental therapist and dental assistant operate around the head of the chair, with the operator normally positioned on the right side of the patient. A dental assistant’s workstation is located behind the head of the chair with adequate operating space, and incorporates the storage of dental materials and equipment, disposable items, and a work surface for retrieving and mixing dental materials.

In both single-room and open-plan surgery designs, the dental assistant’s workstation and adequate shared storage units for equipment and disposable items should be specifically designed for user accessibility, space efficiency, infection control and the easy maintenance of a clean, clutter-free work environment. The dental surgery is essentially designated a dirty area, with all sterilising services carried away from the surgery to a separate sterilising area.
7 Support Areas

The extent to which the following support areas are included in an oral health facility will depend on the size and location of the unit:

- plant room
- instrument reprocessing / sterilising
- resuscitation trolley bay
- stores – supplies and equipment
- linen store
- x-ray processing
- laboratory
- cleaner’s room
- disposal room.

In small, single-surgery units serviced by a visiting dentist or dental therapist, for example, the full range of facilities will probably not be appropriate. Arrangements will need to be made for services not available on site, which will commonly include sterilising and laboratory needs.

7.1 Laboratory

Laboratory work is likely to be outsourced. However, if included in the clinician’s scope of practice there may be a minimum requirement for a small area in larger community-based clinics where staff are able to trim, adjust or polish dentures or appliances. There may also be a need to pour impressions before they are sent out to a laboratory.

7.2 X-ray processing room

The requirements will depend on the type of processor. The options for film processing are dark-room or daylight processing. A dark room will be required if a processor without a daylight loader is used, while a processor with a daylight loader can be positioned in an assigned bench area of the facility.

The minimum space requirement is 6 m². Water and waste facilities and storage for chemicals are required. Radiographic film processing will not be required if digital radiography is utilised, but additional IT software and hardware will need to be considered and accommodated.

7.3 Staff offices and amenities

If no dedicated staff room is provided, provision must be made for staff amenities in a secure environment. Depending on the type of facility and location, the staff room and toilets may be shared with other units. If there is no dedicated staff room, a small beverage bay, separate from the clinical facilities, may be considered, or this may be located within a larger facility (eg, a health centre or school). It is not acceptable for food and beverage to be consumed in clinical or sterilisation process areas.
Offices and workstations must comply with ergonomic recommendations as to their size and allocation.

A tutorial room will be required in larger facilities that support student teaching and staff in-service training. Smaller units may share a similar type of room, or access this from facilities located elsewhere.

### 7.4 Information technology

Planning IT systems to support clinical and operational activities is an essential part of any facility configuration. Items to consider are:

- the patient management system
- telecommunications
- other technology (eg, digital radiography, telemedicine).

### 7.5 Car parking

Ready access to parking will be necessary for patients and their supporters, including disabled drop-off and parking. Facility planners should refer to the local council by-laws for the required number of car parks which will be facility specific, and determined by its function, size and location.
8 Infection Control

8.1 Environmental

The planning and construction of any new facility must incorporate the principles of environmental control to minimise contamination from particulates and micro-organisms. Consideration should also be given to work flow and surface finishes.

The general layout of the dental surgery is based on a streamlined design applying infection control principles. The surgery design must focus on minimising the number of surfaces likely to be exposed to aerosols, by concealing equipment (other than that associated with the dental chair) or removing certain items (eg, the x-ray viewer and administration area) away from the zone of aerosol contamination.

Aerosol contamination can be reduced by ensuring that a minimum area of 1 m radius around the reclining patient’s head is clear of work surfaces and unnecessary equipment. The minimum recommended surgery size to achieve this (and to allow for access and equipment) is 4.5 m x 4 m. The use of high-volume evacuation equipment and providing barriers over surfaces is also important to minimise aerosol effects. In addition, regular cleaning of the facility must be undertaken to minimise the number of micro-organisms in the environment and to keep all surfaces clean and tidy.

Procedures must be implemented for the safe handling and appropriate disposal of contaminated materials and waste. Hands-free access to bins for paper and clinical waste is recommended.

8.2 Personal hygiene and protection

Hand-washing facilities in every dental surgery are essential, and must not be combined with sinks used for other purposes, such as decontamination and instrument cleaning. Emphasis should be given to the use of hands-free facilities, where possible (eg, elbow or knee operated taps or infra-red-activated operating lights and hand-basin taps). Note, however, that infra-red taps can be a maintenance problem because they require two technicians (plumber and electrician) to service them, and the flow rate cannot be adjusted by the user.

Appropriate personal protective equipment (such as gloves, protective eyewear, gowns and face masks) must be used to reduce the risk of exposure to blood and body fluids. Access to dispensers and storage for personal protective equipment must be considered in each surgery to ensure their ease of use.

Storage and space for the disposal of contaminated goods and access to transport by an approved carrier for used/contaminated items must be available.

9 Aerosols are generated by the dental handpiece and air/water syringes.
8.3 Instrument reprocessing area

The main function of the instrument reprocessing area is to make contaminated equipment used in oral health care fit for re-use. The area must accommodate a waste collection point, and equipment cleaning and sterilisation area, and a storage area for sterile goods. The design should permit a flow of activities from dirty to clean to sterile. It has been estimated that 5 m of bench space is required for these activities.

The provision of a hand-washing facility in the decontamination area is a standard precaution for controlling infection.

Storage must be arranged so that the items are protected from environmental contamination.

The size of the space and the equipment selection will depend on the number of surgeries being serviced, workplace processes, and staffing (ie, the number of staff requiring access to the sterilising area at any one time). Consultation with local infection control personnel and sterilisation staff is advisable.

Advice for the design and layout of these areas is contained in AS/NZS 4815:2006 and AS/NZS4187:2003, and Dental Council of New Zealand Code of Practice: Control of Cross Infection in Dental Practice.
9 Health and Safety

9.1 Overview

We endorse the Queensland Health (2004) *Oral Health Facility Design Guidelines* following recommendations regarding health and safety:

The facility must provide a safe working environment which will not cause any risks to the health of the occupants. In addition to those risks and hazards commonplace in health care environments, there is specific occupational health and safety issues associated with oral health facilities.

Examples of health and safety issues of particular relevance to oral health facilities include:
- leaning over reclined patients to provide treatment
- working with infectious materials
- heat and noise associated with sterilising procedures
- working with potentially harmful chemicals.

9.2 Sole operator


Factors such as professional isolation, personal safety and problems managing cross-infection control were identified as significant issues for sole operators. The development of new service delivery models and facilities will provide opportunities for addressing issues relating to sole operators.

We anticipate that new clinical facilities will not be designed for sole operators, and that the minimum operating staff levels will involve a dental clinician (dental therapist or dentist) and a dental assistant. The service models the service intends to operate under (eg, shared (2:1 or 3:2 or other) or 1:1 dental assistants) must be considered. This will affect the workforce plan, patient flow and operating chair requirements for each facility.
10 Building Services and Environmental Design

All services must satisfy the service level and procedure requirements for the specific facility. Services should be designed and installed in a manner that will allow easy access for maintenance and cause only minimal disruption when maintenance is required.

10.1 Electrical systems

The requirements for electrical installations in health care facilities are those set out in NZS 3003.1:2003 – Electrical Installations. At the time of writing, a draft New Zealand standard DZ 6115, Electrical Installations, Mobile Electro-medical Connectable Installations was under development. Designers of new mobile facilities should review the status of this standard and apply accordingly.

Uninterruptible power supply (UPS) systems are required in all clinical areas where it is essential to maintain facility operations during a power outage and/or to protect electronic data. Note that large UPS systems are heavy and expensive.

10.2 Patient privacy

The Health and Disability Commissioner’s Code of Health and Disability Services Consumers’ Rights Regulation 1996, Right 1, provides for the ‘Right to be treated with respect’. As an example, the Health and Disability Commissioner’s (1998) Report on Canterbury Health Limited discusses areas that were, in her opinion, a breach of Right 1(2):

The dental clinic was open plan, with three dental chairs sharing the same area, resulting in no privacy for consumers during consultations. In addition, new patients were required to provide personal information at the front desk, which was located in the waiting area.

The planning and design of oral health units must ensure that every consumer has his or her privacy respected.

10.3 Security

Some form of access deterrent or barrier is required between the waiting area and clinical/administrative areas. Controlled after-hours access will be necessary and should be possible independently of other facilities within which the facility is located (e.g., school, health centre). Security of records, staff property and (when required) monies must be considered during the facility design stage.

Consideration may be given to a duress alarm system at reception and in surgeries. Factors to consider include where the alarm would sound and who would be alerted.

Facilities must have clear entry and exit points. In general this will require having two external doors.
10.4 Acoustics

Noise levels should not exceed those established in the Department of Labour Control Guide, *Management of Noise in the Workplace*.

10.5 Lighting

Natural light is not essential in surgeries, although colour-corrected light is necessary for colour matching dental restorations (not patient observation). However, bear in mind that views through a window improve the work environment.

10.6 Access and mobility

Access for patients in wheelchairs and other mobility aids must comply with New Zealand Building Standards.

10.7 Information and communication technology (ICT)

The requirements for ICT systems will be determined by the type and function of the facility. Facility planners need to consider requirements for telecommunications such as telephone and intercom systems, and computers to support an electronic clinical record, with the option to include digital radiography and all administration functions. Consideration should be given to ensuring ICT systems are available in all surgeries and administration areas.

It may be desirable to install voice-data outlets, Master Antenna Television (MATV) in waiting rooms and background music.

10.8 Radiation screening

All x-ray equipment and rooms must meet the radiation safety requirements of the National Radiation Laboratory (NRL). In the design stage it is essential to address wall shielding and create controlled areas that ensure operator exposure is managed within the NRL guidelines (0.5 mm lead equivalent; 1.6 mm galvanised steel is acceptable).

Refer to NRL – C7, Scope of Practice for the Use of X-rays in Dentistry (June 1991). The purpose of this code is to provide criteria for working procedures, x-ray equipment and protective materials necessary for the use of x-rays in dental diagnosis according to currently accepted standards of safety. Conformity with this code may be taken as a primary indication of compliance with radiation protection legislation.

10.9 Heating, ventilation and air conditioning

Air conditioning is desirable in all clinical areas during standard operating hours. The capacity to override air-conditioning time clocks to provide emergency service in either one surgery or the total unit after hours may be required.
Provision must be made to ensure an adequate air supply, with filters appropriate to the facility, and for exhaust from the steriliser in the reprocessing room and suction unit exhaust in the plant room. Air intake to the compressor should also be considered. Separation of air intake and exhaust discharges must be maximised, and as a minimum comply with requirements of the New Zealand Building Code.

All occupied areas should be heated with thermostatically controlled heaters, which may be part of an air-conditioning system. Portable heaters and unflued gas heaters should not be installed in patient areas.

Film-processing areas and sink units used in connection with the regular cleaning of x-ray processors must be provided with adequate exhaust ventilation to ensure they are capable of containing, diluting and removing any vapour released from the process, and preventing the spread of fumes from chemicals into occupied spaces).

**10.10 Water**

Dental units require water filtered for particulate matter. Water metering to the clinical area may be required for waste management purposes depending on local authority regulations.

Operating units generally have integral suction systems, which remove contaminated water and body fluids from the operation site. This waste requires coarse filtering (usually integral to the unit) and separation of heavy metals, followed by disposal.

**Portable suction units**

Over the last decade many DHBs have purchased portable suction units, which are fitted with a debris filter only. Increasingly there is a requirement for an amalgam separator on all suction unit waste-water lines. The process for the daily disposal of waste water from the suction unit canister will depend on the local authority regulations. In order to convey exhausted air outside, the user must fit an extension hose from the unit to the outside of the building.

As facility planning will focus on multiple chair facilities it is likely that the current extensive use of portable suction units will be replaced with suction units housed in a plant room. New facilities should incorporate the use of a suction plant outside the dental surgery to control noise and air emissions, and to improve waste-water management.

**10.11 Medical gases**

Which medical gases are used will depend on the level of service provided by the facility. Oxygen must be available in all dental surgeries but may be delivered via a portable bottle for emergencies. For level three services piped gases may be preferable where nitrous oxide sedation is used, as there are cost savings with larger cylinders, fewer problems moving machines with bottles, less likelihood of running out of gas, and a reduction in manual handling of heavy equipment.
10.12 Plant room and supply lines

A plant room of sufficient size to accommodate all the mechanical and electrical plant is required. Service supply lines (compressed air, vacuum, extraction systems, etc) and plumbing lines may be run under a suspended floor slab, overhead, or through channelled concrete. Supply lines can also be in external ducting, with short, straight under-floor ducts to service the connection point for the dental unit. Services should not be incorporated into a concrete slab because this makes future maintenance and modifications difficult and expensive.

Design and routing of service supplies can critically affect system performance and should be discussed in detail at the facility design stage. It is essential that all installations allow for easy service maintenance and the future alteration, expansion or upgrade of equipment.

The plant room must be adequately ventilated to allow for the proper operation of equipment and to relieve the heat produced by motors and other equipment.

10.13 Interior finishes

Internal finishes in dental facilities are important in meeting compliance with infection control and health and safety standards. Wall surfaces should be smooth, impervious and easy to clean, work benches and surfaces should be durable and constructed of non-porous material with integral splash backs at walls for easy cleaning. Stainless steel is desirable in areas of high use.

Floor in all wet areas should be finished with vinyl sheeting, coved at walls.

Carpet or similar soft flooring option may be installed in the reception, waiting areas and staff office and meeting areas only.

Consideration should be given to acoustic ceilings.

The width of doors must allow ease of passage for trolleys, equipment and personnel and provide disabled access in patient areas.

The selection of window coverings should address the control of sunlight. This is an essential requirement in all surgeries and desirable in frequently populated rooms.

10.14 Dental surgery joinery

All joinery is to be constructed from moisture resistance Board. There is to be no exposed timber, ie, surfaces including drawers must be laminated or of moulded plastic, to maintain infection control standards.

Orientation and arrangement of joinery will be affected by room shape, window and door location.

The arrangement of the desk area, cupboards and drawers can vary depending on the service requirements. In general there are two standard sets of drawers, one next to
the write up desk and the other positioned for easy access by the assistant. The balance of the bench space is filled with storage cupboards and rubbish collection bins.

An open section under the bench top to ‘house an assistant cabinet is recommended. The mobile cabinet will have specific drawer sizes for storage of dental instruments and materials.

10.15 Signage

It is recommended that external signs will clearly indicate the Community Oral Health Facility, its address, phone number and operating hours. Internal signs will direct patients and identify rooms as appropriate.

Decisions on design and placement of signage should be in accordance with the DHB Signage Policy.

10.16 Fire requirements

Fire requirements are site specific and should be addressed during the facility design stage.
11 Mobile Dental Units

11.1 Overview

Mobile dental units will usually be commissioned for use in remote, rural locations where the cost-effective and accessible delivery of dental services from fixed facilities is not possible. Mobile services may also be used in some urban settings for populations that do not have easy access to a fixed facility, or where outreach services to high-need populations are required.

Units may be towed or self-propelled, ranging from smaller, one-chair, high-volume examination and preventive care units, to two-chair units that can be used for examination, preventive and treatment services. It is important to consider the size and practicality of the unit needed in relation to the locations it will be required to service. Appropriate access to a suitable site and services (concrete pad, electricity, clean and waste water, data and phone) must be available at each location.

Mobile units appear to be similar in cost to fixed facilities to develop but can have significantly higher maintenance and depreciation profiles, increasing their overall cost to operate. Parking, security, relocation of units and staff transport costs need to be factored into the overall cost of providing services from a mobile facility.

11.2 Planning considerations

The general principles that apply to developing fixed facilities apply to mobile facilities. The following list includes issues that are recommended for particular consideration when developing and designing a mobile facility. (Note that this list is not all-inclusive.)

- Layout and cabinetry design: these must support the purpose, ergonomic needs, instrument reprocessing, staff numbers and staff mix, and patient throughput and waiting areas.
- Chassis: a durable, watertight, reinforced floor is recommended. Insulation should provide the best possible protection from outside temperatures.
- Levelling jacks: there should be one on each corner to provide stability when the unit is stationary.
- Access: there should be two doors – nearside front and rear.
- Steps: these should be fold-away, lockable when in position, and incorporate a handrail.
- Awnings: there should be awnings over both doors.
- Windows: tinted security windows are best, with insect screens and blinds.
- Services: these will include a compressor, evacuator motor, water inlet, and pump for the base of the dental chair(s).
- Mounting brackets: these are required for lights, the x-ray unit and dental unit.
- Electrical services: these must comply with AS/NZS 3001 – Electrical Installations – Relocatable Premises (including caravans and tents) and Their Site Installations, and AS/NZS 3000, known as the Australia/New Zealand Wiring Rules.
• Water supply: use a dual system so that town water can be used when available, plus storage tanks beneath the vehicle floor (but protected from road damage).
• Filtered water supply: this is required for the dental unit and sinks.
• Water filter: use a filter suitable for use in dental units, and locate this with the water pump.
• Hot water system: use a tank with a minimum 25 litres capacity.
• Waste disposal: solid and water waste must comply with territorial local authority and regional council requirements where the unit will be operated.
• Compressed air: a reticulation system is required to service the dental units.
• Air conditioning: use one unit per chair; roof-mounted. Condensate must drain outside the vehicle.
• Internal finishes: cabinetry and bench tops must be easily cleaned.
• Sinks/basins: there should be a minimum of two clean and one dirty.
• ICT connections: these include phone and data lines.

Equipment: must be properly secured to be protected from road shock and vibration, and wall-mounted x-rays and lights must be secure in-transit. Water and air lines must not leak, on-board power generators cannot make too much noise and/or vibration, and equipment must be properly placed to ensure there is adequate space for dentists and technicians to operate.

The maximum width for a standard vehicle is 2.5 m, which is considered too narrow to accommodate the functional areas required in an oral health facility. A wider facility may be constructed, although DHBs should note that there are additional operating conditions imposed on these vehicles, such as a restriction in travelling times.

The Land Transport New Zealand Information sheet 1.10, revision 4, Policy and Planning, Vehicles (October 2005), provides a comprehensive guide to the standards required for different vehicles. It sets out the definitions of the different vehicle classes and the standards that must be met by vehicles of each class. DHBs must refer to the Land Transport New Zealand requirements when planning their mobile facilities.

11.3 Policy and practice considerations
Mobile units require significant thought as to the operational policies that will be applied to the use of the unit. The following list includes issues that are recommended for consideration when developing and designing a mobile facility:
• unit garaging, and the maintenance and relocation programmes (see also Land Transport New Zealand vehicle classes and standards)
• fire and emergency
• appointment and administration systems
• records management – including the transport, storage and retrieval of patient files
• management of medical emergencies
• infection control and the sterilising process
• source of supply of consumables
• waste disposal – solid and water
• a clean water supply
• x-ray film processing and radiation protection
• staffing – clinical and administration support
• access to shared and common areas.
12 Dental Facility Upgrades and Refurbishments

The guidelines for new fixed facilities apply to investment in fixed facility upgrades (eg, remodelling and refurbishment of existing school-based dental clinics). In planning facility upgrades, a decision must first be made about the level of care to be provided from the facility, including the number of dental units, staffing and support services required.

If the facility cannot accommodate the recommended schedule of accommodation, design and layout (footprint), then service planners and providers must consider relinquishing the facility, extending the facility, constructing a new facility, or exploring alternative options for delivering oral health services to that community.
13 Components of a Unit

The oral health unit will consist of a combination of standard components and non-standard components, depending on the level of service to be provided and the type of facility.

13.1 Standard components

Examples of standard components to be considered in facility design can be found in room data sheets contained in this section of the guideline, the Public Dental Clinic Technical Information Kit – Dental Health Services, Victoria, and the Queensland Health Oral Health Facility Design Guidelines. Facility planners and designers are encouraged to refer to these documents for specific information about room requirements.

13.2 Non-standard components

Facility design should provide for non-standard components according to the Operational Policy and Functional Brief. Below are examples for:

- dental surgery
- sterilising room
- plant room
- dental laboratory.

13.3 Dental surgery

Description and function

The surgery is used for consultation, examination and treatment of patients – some of whom will be accompanied by parents/whānau – and for the storage of equipment and materials associated with such treatment. Wheelchair access may be required.

Location and relationships

The surgery will be associated with the sterilisation room and waiting room.

Considerations

These include:

- sound proofing
- medical gases (oxygen)
- air conditioning
- floors and walls – these must be non-porous, smooth and easily cleaned
- RCD-protected electrical fittings
- lighting – natural, plus high-intensity colour-corrected artificial lighting
• fibre-optic data cable or copper cable (Category 6 – fibre used to connect buildings together) connection to reception
• walls – these may require reinforcement for weight-bearing equipment.

Fixtures and fittings will include:
• dental chair
• specialist fittings (eg, overhead light, x-ray unit, dental unit)
• computer terminal
• x-ray viewer
• operator’s chair
• assistant’s chair
• hand-washing facilities (elbow-touch taps or infra-red)
• support persons’ chairs
• dental cabinetry and overhead cabinets
• intercom and/or duress call
• bins for general waste, clinical waste and sharps
• whiteboard
• clock
• wall mirror.

13.4 Instrument reprocessing room

Description and function
There needs to be a designated room for cleaning and sterilising instruments and equipment. Its size will depend on the number of surgeries and the availability of staff. It has been estimated that a bench area of 5 m will be required to support the entire process.

Design and layout must enable a ‘dirty to clean’ work flow. This can be achieved by having two adjoining spaces with a ‘hatch’ or walkway between them, or simply by careful arrangement of benches and equipment, depending on the size of the unit.

In particular, there must be ‘zones’ for the following functions:
• receipt of contaminated instruments
• cleaning (rinsing, scrubbing, ultrasonic)
• decontamination (washer/disinfector)
• packing and sealing
• sterilising
• cooling
• storage.

Storage within the room must be enclosed and protected from environmental contamination (heat, splash contamination).
Equipment and fit-out of the unit should include:
- stainless steel benchtops with inset sinks for cleaning and rinsing
- ultrasonic cleaner
- hand basin
- washer/disinfector
- packing bench with shelves for storing packaging materials and a heat sealer
- steriliser (plumbed or portable/benchtop)
- cooling bench
- storage.

**Function and relationships**
The instrument processing room should be adjacent to the dental surgeries and dental laboratory, centralised to reduce the distance between these areas.

**Considerations**
These include:
- non-slip flooring
- equipment specifications – sterilisers, disinfectors, etc must comply with relevant Australian/New Zealand standards.

13.5 **Plant room**
The plant room will house equipment including water filtration equipment, dental suction plant and air compressors, and medical gas storage. Note: medical gas cut-off valves should be easily accessed, and not in the plant room.

The plant room must be a minimum of 6 m², but the actual size will depend on the amount of equipment to be accommodated, and the layout.

**Location and relationships**
The plant room should be located to minimise the impact of noise and heat generated by equipment on adjacent areas. Access to the plant room though an external door is recommended, because internal access may present noise issues.

**Considerations**
Services required for equipment may include compressed air, cold water, and both single- and three-phase power. Additional requirements may include floor wastes and reservoirs for waste water, external exhausting for suction system air discharge, and room ventilation.

Remote isolation switches for plant should be considered (the sterilising room or reception are ideal locations) so that plant can be easily shut down at the end of the day. The room should be acoustically treated and, if possible, positioned away from the
surgery. Adequate ventilation for equipment operation and heat removal must be provided.

13.6 Dental laboratory

Description and function
This functions as an area for adjusting and polishing dentures, and for constructing prosthetic appliances and other items relating to dental treatment (unless outsourced).

Location and relationships
The dental laboratory should be located with ready access to the dental surgery rooms.

Considerations
These include:
- lighting – a natural / fluorescent mix for colour matching
- moisture-resistant joinery – all surfaces (including drawers) must be laminated or made from moulded plastic for ease of cleaning
- a storage area for models
- inclusion of a plaster trap under the sink is advised if the use of plaster for dental models is envisaged
- non-slip vinyl flooring
- mechanical debris/dust extraction (external exhausting) through hoods in polishing bays and at desk-tops
- natural gas connections and air outlet(s)
- a master trap, if there is going to be model pruning.

Equipment may include:
- plaster bins
- skip for waste plaster
- ultrasonic cleaner
- model trimmer
- plaster vibrator
- casting machine
- polishing machine
- dental lathe
- vice
- boil-out unit
- Bunsen burners
- vacuum-former
- processing tank.
## 14 Dental Surgery Equipment

The following section will assist DHBs and facility planners with the selection and purchase of suitable dental equipment, design features and installation requirements.

**Table 1:** Essential items of dental equipment where installation must be considered at the design and layout stage

<table>
<thead>
<tr>
<th>Item</th>
<th>Features for consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dental operating unit</strong>&lt;br&gt;Dental chair</td>
<td>Back rest size; position and width of back/base hinge; programmed positions; foot-operator controlled; upholstery design; position of service box; headrest design</td>
</tr>
<tr>
<td>Cart, including handpiece delivery system</td>
<td>Over patient, cart or wall mounted; self-contained or mains water supply</td>
</tr>
<tr>
<td>Light</td>
<td>Colour corrected; safety shield/shade and easily cleaned</td>
</tr>
<tr>
<td>Cuspidor</td>
<td>Over patient; cart or wall mounted</td>
</tr>
<tr>
<td>Assistant triplex and suction</td>
<td>High-volume evacuation; housing; air quality; noise; central system vs individual unit; wet, dry or semi-wet system; amalgam separation; exhaust; filters; ease of cleaning; service intervals; piping design</td>
</tr>
<tr>
<td><strong>Suction unit</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Compressor</strong></td>
<td>Oil-free; housing; noise; size (related to surgery numbers); peak drawdown demand; service intervals</td>
</tr>
<tr>
<td><strong>Autoclaves</strong></td>
<td>Before purchasing autoclaves, consider your planned sterilisation and instrument reprocessing system. Either: office-based – class of autoclave relevant to NZ standard; maintenance (self-contained with drier); availability of parts; door design; loading system; cylinder size; cycle-reporting system; validation and calibration system or central sterile supply (CSS) based – talk to your DHB infection control service; consider logistics, equipment inventory and staff availability for central processing</td>
</tr>
<tr>
<td>‘Other’ infection control equipment</td>
<td></td>
</tr>
<tr>
<td>Ultrasonic cleaner</td>
<td>Bench-top or inbuilt; dimensions; calibration and validation systems</td>
</tr>
<tr>
<td>Instrument washers</td>
<td>Bench-top or inbuilt; loading system; loading flow; manual handling; door type and dimensions</td>
</tr>
<tr>
<td><strong>X-ray equipment</strong></td>
<td></td>
</tr>
<tr>
<td>Camera</td>
<td>Fixed vs mobile; Kvs; digital (DC) or analogue (AC); collimation; arm length; stability; head size; control panel – position and ease of use</td>
</tr>
<tr>
<td>Image system</td>
<td>Digital or film based; will you require intra-oral only, or extra oral systems (eg, Panoramic)?</td>
</tr>
<tr>
<td>Digital</td>
<td>Sensors; reusability and lifespan of sensors; IT structure – includes network, cabling, servers integration with public access computer systems (PACS)</td>
</tr>
</tbody>
</table>
Warranty, service back-up and supply of parts must be considered when purchasing all items of equipment.

**Table 2:** Clinical equipment for consideration and installation requirements

<table>
<thead>
<tr>
<th>Item</th>
<th>Feature to consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra-oral camera</td>
<td>• Mounted or stand-alone</td>
</tr>
<tr>
<td></td>
<td>• Head size</td>
</tr>
<tr>
<td></td>
<td>• Lensing system</td>
</tr>
<tr>
<td></td>
<td>• Software</td>
</tr>
<tr>
<td></td>
<td>• Imaging system</td>
</tr>
<tr>
<td>Air abrasion unit</td>
<td></td>
</tr>
<tr>
<td>Diagnostic laser</td>
<td></td>
</tr>
<tr>
<td>Treatment laser</td>
<td></td>
</tr>
<tr>
<td>Other new technologies</td>
<td></td>
</tr>
</tbody>
</table>

The following equipment does not have specific installation requirements, but is essential in a dental facility and needs to be considered in the design and layout of surgeries:

- curing light
- amalgamator
- dental handpieces – high-speed, low-speed, air motors
- sonic or ultrasonic scalers
- operator chair
- assistant stool
- bio-test incubator
- endodontic equipment – surgical motor and handpiece
- automated handpiece-oiling system is desirable.
## 15 Information and Communication Technology (ICT)

Planning IT systems to support clinical and operational activities is an essential component of any facility design and service reconfiguration. The following table lists items for consideration when planning a dental facility.

**Table 3: Items to consider when planning an oral health facility**

<table>
<thead>
<tr>
<th>Item</th>
<th>Feature to consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient management system (PMS)</td>
<td></td>
</tr>
<tr>
<td>• Integrated electronic clinical record</td>
<td></td>
</tr>
<tr>
<td>• Partial data capture</td>
<td></td>
</tr>
<tr>
<td>• Manual systems</td>
<td></td>
</tr>
<tr>
<td>• Hardware – laptop or personal computer</td>
<td></td>
</tr>
<tr>
<td>• Server</td>
<td></td>
</tr>
<tr>
<td>• Connection:</td>
<td></td>
</tr>
<tr>
<td>- dial up</td>
<td></td>
</tr>
<tr>
<td>- landline</td>
<td></td>
</tr>
<tr>
<td>- broadband</td>
<td></td>
</tr>
<tr>
<td>• Software support</td>
<td></td>
</tr>
<tr>
<td>• IT expertise</td>
<td></td>
</tr>
<tr>
<td>• Systems maintenance</td>
<td></td>
</tr>
<tr>
<td>• Local area network or wider area network (LAN/WAN)</td>
<td></td>
</tr>
<tr>
<td>• Storage and back-up of files</td>
<td></td>
</tr>
<tr>
<td>• Scheduling</td>
<td></td>
</tr>
<tr>
<td>Telecommunication – internal network and external network</td>
<td>Private automatic branch exchange (PABX) vs individual lines</td>
</tr>
<tr>
<td></td>
<td>Landline or cellphone based</td>
</tr>
<tr>
<td>Linkages</td>
<td>To the provider organisation systems (eg, intranet)</td>
</tr>
<tr>
<td></td>
<td>Internet access</td>
</tr>
<tr>
<td>Other technology</td>
<td>Digital camera</td>
</tr>
<tr>
<td></td>
<td>Telemedicine</td>
</tr>
<tr>
<td></td>
<td>Personal data assistants (PDA)</td>
</tr>
</tbody>
</table>
References and Further Reading

1. New Zealand

Documents


New Zealand standards

- NZS 3003:1 2003 – Electrical installations – Patient areas of hospitals and medical and dental practices.
- NZS 4303:1990 – Ventilation for acceptable indoor air quality.
- NZS 4304:2002 – Management of healthcare waste (refer also to local body regulations for waste management requirements pertaining to water and sewerage).
- NZS 8142:2000 – Infection control.
- AS/NZS 4187:2003 – Cleaning, disinfection and sterilising reusable medical and surgical instruments, and equipment and maintenance of associated environments in health care facilities. This standard sets out procedures and process development which can be validated for the cleaning, disinfection and sterilisation of reusable medical and surgical instruments and equipment, and maintenance of associated environments in health care facilities.
- AS/NZ 4815:2006 – Office-based health care facilities not involved in complex patient procedures and processes. This standard sets out procedures and process development, which can be validated for the cleaning, disinfection and sterilisation of reusable medical and surgical instruments and equipment, and maintenance of associated environments in office-based health care facilities not involved in complex patient procedures and processes.
Relevant regulations and codes of practice

- Code of Health and Disability Services Consumers’ Rights Regulation, Health and Disability Commissioner, 1996.
- New Zealand Health (Retention of Health Information) Regulations, 1996.

Dental Council of New Zealand codes of practice

- New Zealand Code of Practice: Medical Emergencies in Dental Practice (endorsed by Dental Council of New Zealand March 2005).
- New Zealand Dental Association and Dental Council of New Zealand Code of Practice: Conscious Sedation for Dental Procedures, April 2006.

Scopes of practice


Other sources

- District Health Board policies.
- Local territorial authority requirements.
- Land Transport New Zealand requirements.
- Regional council requirements.

Websites

- Dental Council of New Zealand (www.dentalcouncil.org.nz)
- District Health Board Oral Health Tool Kit (www.newhealth.govt.nz/toolkits/oralhealth.htm)
- New Zealand Dental Association (www.nzda.org.nz)
- New Zealand Dental Therapists Association (www.nzdta.co.nz)
2 Australia


Appendix 1: Policy Framework for this Guideline

The strategic vision for oral health is shaped by the principles of the following key health strategies:

- *New Zealand Health Strategy*
- *He Korowai Oranga: Māori Health Strategy*
- *Primary Health Care Strategy*
- *Health of Older Persons Strategy*
- *New Zealand Disability Strategy.*

Key documents that have influenced these guidelines are:

Appendix 2: Role Delineation and Organisation of Dental Care

This Guideline recommends a role delineation and organisation system with a hierarchy of levels of care, from less complex to more complex, with consideration given to local needs, resources, cultural diversity and geographical constraints. This appendix considers in more detail the service characteristics of the four levels of service based on the American Society of Anaesthesiologists (ASA) Patient Status Classification System, and how they relate to the different facility types.

Level 1

Level 1 means access to examination and preventive oral health care for normal healthy patients or patients with mild systemic disease delivered from a fixed (purpose and non-purpose built) or mobile dental facility in a community. The following service characteristics are considered essential for a Level 1 service.

Table 4: Service characteristics essential for Level 1 service

<table>
<thead>
<tr>
<th>Feature</th>
<th>Service characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client group</td>
<td>Referral/recall from the community population, primarily the eligible child and adolescent population but may include examination for high-needs groups (eg, special needs and the older persons).</td>
</tr>
<tr>
<td>Services provided</td>
<td>Examination and preventive oral health services.</td>
</tr>
<tr>
<td>Staffing</td>
<td>Dental therapist or dentist, supported by a dental assistant.</td>
</tr>
<tr>
<td>Facilities</td>
<td>Single dental chair/exam.</td>
</tr>
<tr>
<td>Support services</td>
<td>Must have a well-defined route of access for general dental treatment services for patients identified with treatment needs.</td>
</tr>
<tr>
<td>Links with other providers</td>
<td>Links with schools, dentists, hospital dental services.</td>
</tr>
</tbody>
</table>

Level 2

Level 2 involves examination and treatment oral health services for normal healthy patients or patients with mild systemic disease delivered from fixed or mobile community facilities. Level 2 services comprise the characteristics of Level 1 service, with the addition of the following service characteristics.
Table 5: Specific Level 2 characteristics

<table>
<thead>
<tr>
<th>Feature</th>
<th>Service characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client group</td>
<td>Referral from health providers and community agencies for child, adolescent, low-income adult and special-needs populations.</td>
</tr>
<tr>
<td>Services provided</td>
<td>Examination, assessment and general dental treatment services.</td>
</tr>
<tr>
<td>Facilities</td>
<td>A surgery to accommodate two dental units for the provision of general dental care. A minimum of two chairs is recommended, with the option to extend to a larger facility for this level of facility. With the exception of unusual circumstances, planners should avoid single-chair units. Privacy for patients – open plan surgery must be separated by partial height partitions. Administration functions should be separated from the operative area. A separate instrument reprocessing area, or off-site instrument reprocessing at a CSSD facility.</td>
</tr>
<tr>
<td>Relationship and support areas</td>
<td>For small surgeries, support and staff areas may be shared with adjoining facilities or located in adjacent on-site buildings (eg, school facilities).</td>
</tr>
<tr>
<td>Links with other providers</td>
<td>Links with schools, dentists, hospital dental services.</td>
</tr>
</tbody>
</table>

Level 3

Level 3 service involves examination and treatment oral health services with the ability to offer sedation services for normal healthy patients or patients with mild systemic disease delivered from community or hospital-based facilities. Level 3 services comprise the characteristics of Level 2 services, with the addition of the following service characteristics.

Table 6: Specific Level 3 characteristics

<table>
<thead>
<tr>
<th>Feature</th>
<th>Service characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client group</td>
<td>Referral/recall from the community population, including children, adolescents, low-income adults, and those with special needs and adults.</td>
</tr>
<tr>
<td>Services provided</td>
<td>Examination and treatment oral health services with the ability to offer sedation services for normal healthy patients or patients with mild systemic disease, delivered from a community or hospital-based facilities.</td>
</tr>
<tr>
<td>Facilities</td>
<td>Multi-chair, community-based – the final number of surgeries and type (shared/single) will depend on the community served. Reception; medical gases (oxygen supply); recovery area.</td>
</tr>
<tr>
<td>Staffing</td>
<td>Dentist with additional training to meet the DCNZ Code of Practice. Dental assistant to support sedation. Staff trained to meet the Medical Emergencies in Dental Practice Standard including sedation. Administration staff.</td>
</tr>
</tbody>
</table>
Level 4

Level 4 involves examination and treatment services with the ability to offer sedation services for normal healthy patients, and examination and treatment services for patients with mild or severe systemic disease delivered from a hospital-based facility.

Primary, secondary and tertiary services are provided from these sites. It is anticipated the facility requirements will be similar to those for a Level 3 service, but this service will be supported by anaesthetists and anaesthetic technicians, nursing, laboratories and general hospital support staff.

The following table outlines the relationship to the model of care and facility types.

Table 7: Relationship between models of care and facility types

<table>
<thead>
<tr>
<th>Facility type</th>
<th>Level of service</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Offsite</td>
<td>Dark grey</td>
</tr>
<tr>
<td>Mobile</td>
<td>Medium grey</td>
</tr>
<tr>
<td>Community</td>
<td>Medium grey</td>
</tr>
<tr>
<td>Hospital</td>
<td>Light grey</td>
</tr>
</tbody>
</table>

Key

Dark grey: good synergy, whereby the facility supports and is appropriate to the planned level of service.

Medium grey: health service planners should proceed with caution – the service may be better served by an alternative facility or the facility will be under-utilised.

Light grey: poor synergy and/or utilisation – these options should not be considered when developing the service and facility plan.
Appendix 3: Schedule of Accommodation

The accommodation schedule indicates example rooms and spaces for community oral health facilities and dimensions for one-, two-, four- and six-chair facilities.

The areas are indicative and space can be potentially reduced and/or combined where an oral health facility is collocated with other services.

<table>
<thead>
<tr>
<th>Room/space</th>
<th>1 chair – Level 1</th>
<th>1 chair – Level 2</th>
<th>2 chairs</th>
<th>4 chairs</th>
<th>6 chairs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantity</td>
<td>Area</td>
<td>Total</td>
<td>Quantity</td>
<td>Area</td>
</tr>
<tr>
<td>Entry/airlock</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Reception</td>
<td>1</td>
<td>10</td>
<td>10</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Store – files</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Store – photocopier/stationary</td>
<td>Share – 0</td>
<td>Share – 0</td>
<td>Share – 0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Administration office</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Waiting</td>
<td>1</td>
<td>10</td>
<td>10</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Child play area</td>
<td>Incl. in waiting</td>
<td>– 0</td>
<td>Incl. in waiting</td>
<td>– 0</td>
<td>1</td>
</tr>
<tr>
<td>Bay – wheelchair park</td>
<td>Share – 0</td>
<td>Share – 0</td>
<td>Share – 0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Toilet/baby change – disabled</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>30</td>
<td>30</td>
<td>35</td>
<td>80</td>
<td>89</td>
</tr>
<tr>
<td><strong>Treatment areas</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dental surgery – single standard</td>
<td>0</td>
<td>14</td>
<td>0</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Dental surgery – single large</td>
<td>1</td>
<td>18</td>
<td>1</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Dental surgery – double</td>
<td>0</td>
<td>40</td>
<td>0</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>Recovery area</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Resuscitation trolley bay</td>
<td>Share – 0</td>
<td>Share – 0</td>
<td>Share – 0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>18</td>
<td>18</td>
<td>36</td>
<td>84</td>
<td>120</td>
</tr>
<tr>
<td><strong>Support areas</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X-ray processing (dark room)</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>OPG room (if required)</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Dental laboratory (if scopes of practice require)</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Instrument reprocessing room</td>
<td>1</td>
<td>8</td>
<td>8</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Bay – linen trolley</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Store – general/repacking</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Cleaner’s room</td>
<td>Share – 0</td>
<td>Share – 0</td>
<td>Share – 0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Disposal room</td>
<td>Share – 0</td>
<td>Share – 0</td>
<td>Share – 0</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Plant room</td>
<td>1</td>
<td>6</td>
<td>6</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Goods reception/loading dock</td>
<td>0</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>18</td>
<td>21</td>
<td>33</td>
<td>78</td>
<td>101</td>
</tr>
<tr>
<td><strong>Staff areas</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bay – beverage</td>
<td>Share – 0</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Staff work room</td>
<td>0</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Workstation</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Staff/meeting room</td>
<td>0</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Toilet – staff</td>
<td>Share – 0</td>
<td>Share – 0</td>
<td>Share – 0</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>5</td>
<td>8</td>
<td>25</td>
<td>34</td>
<td>40</td>
</tr>
<tr>
<td><strong>Total net area</strong></td>
<td>71</td>
<td>77</td>
<td>128</td>
<td>276</td>
<td>350</td>
</tr>
<tr>
<td>Discounted circulation %</td>
<td>25.0%</td>
<td>17.75</td>
<td>25.0%</td>
<td>19.25</td>
<td>25.0%</td>
</tr>
<tr>
<td><strong>Total gross area</strong></td>
<td>88.75</td>
<td>96.25</td>
<td>161.25</td>
<td>364.3</td>
<td>462.0</td>
</tr>
<tr>
<td><strong>Gross area per chair</strong></td>
<td>88.75</td>
<td>96.25</td>
<td>80.83</td>
<td>91.08</td>
<td>77.00</td>
</tr>
</tbody>
</table>
Appendix 4: Example Floor Plans

DHB strategic asset plans undertaken in 2005 outlined facility options ranging from one- to eight-chair surgeries. On the basis of this information example floor plan layouts for building new facilities have been provided for one-, two-, four- and six-chair facilities. The plans are one possible response to the requirements of the guidelines and standards outlined in this document and are provided as an example.

DHBs will be required to commission detailed drawings for their agreed facilities. It would appear that there is significant opportunity for a collaborative approach for procuring final facility drawings.

Floor plans are included for the following facilities:

- Facility to accommodate one dental unit, x-ray processing, instrument reprocessing, plant room, store, patient waiting, and reception/office area.

- Facility to accommodate two dental units, centralised instrument reprocessing, reception and administration, staff work stations, support areas (x-ray processing plant room, records), public toilet, patient waiting, staff toilet and staff room.

- Facility to accommodate four dental units, centralised instrument reprocessing, reception and administration, support areas (x-ray, plant room, records), stores and supplies, patient waiting, patient toilet, staff offices, staff/meeting room and toilet(s).

- Facility to accommodate six dental units, centralised instrument reprocessing, reception and administration, support areas (x-ray, plant room, records), stores and supplies, patient waiting, patient toilet, staff offices, staff/meeting room and toilet/s. A separate consultation room may be considered for a facility of this size.

- An overlay of the dimensions permissible for mobile dental facilities on the one dental unit facility diagram to provide an indication of the space available to accommodate a dental facility.
Appendix 5: Quantity Surveyor Costs

A quantity surveyor can provide facility cost estimates based on the floor plans, the facility guideline and a brief description from the architect.

Particular note should be taken of the cost exclusions listed in quantity surveyor reports. The impact of many additional costs are site specific and must be taken into consideration to determine the project budget, which will form part of the business case submission.

Where costs for rebuilding/remodelling exceed those of new buildings, DHBs are encouraged to review their plans and carefully consider the advantages and disadvantages of the planned facility in preference to a new building. Or an alternative site may be utilised as a dental surgery. Issues of land ownership and operational costs must be taken into consideration.

DHBs will need to obtain quantity surveyor costs of their agreed facility plans, but it would again appear that there is an opportunity for a collaborative approach for procuring buildings where DHBs have jointly procured facility plans.