

Chapter 3.3**BALANCING THE ROLE OF THE DENTAL SCHOOL IN TEACHING, RESEARCH
AND PATIENT CARE; INCLUDING CARE FOR UNDERSERVED AREAS**

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Abstract

Inequalities within dentistry are common and are reflected in wide differences in the levels of dental health and the standard of care available both within and between countries and communities. Furthermore there are patients, particularly those with special treatment needs that do not have the same access to dental services as the general public. The dental school should aim to recruit students from varied backgrounds into all areas covered by the dental health-care team and to train students to treat the full spectrum of patients including those with special needs. It is essential, however, that the dental student achieves a high standard of clinical competence and this cannot be gained by treating only those patients with low expectations for care. Balancing these aspects of clinical training is difficult. Research is an important stimulus to better teaching and better clinical care. It is recognised that dental school staff should be active in research, teaching, clinical work and frequently administration.

Conclusion: Maintaining a balance between the commitments to clinical care, teaching and research while also taking account of underserved areas in each of these categories is a difficult challenge but one that has to be met to a high degree in a successful, modern dental school.

Key words: *Dental education, research in oral health sciences, patient care, underserved areas, special health care needs, under-represented minority recruitment,*

The dental school in the context of a university: acquisition of competences by dental students

Dental schools should be placed within universities closely associated with the other health sciences. This does not necessarily need be a physical closeness but it should at least have links to the other health sciences in the areas of teaching, delivery of clinical care and research. Dentistry is a health science with its own strong scientific base. As well as having a background in numerous areas of human biology and medicine, some dental subjects, especially dental materials, relate closely to the natural sciences and engineering. Management of dental diseases and prevention are closely linked to the social as well as the basic sciences (1, 2). Consequently dentistry should interact with several other university disciplines and this will vary according to the different emphases existing in different dental schools.

It is important for university and health authorities to recognise the seemingly obvious point that the mouth is part of the human body and that the separation of dentistry from medicine should only be one of administrative convenience. There is a need in all models of health care to recognise the need to integrate dentistry into the whole structure of health care on an equal footing with the other health care disciplines. This may have been more easily achieved in those countries where stomatology was the discipline covering dental subjects but where a strong link to medicine was maintained. Many recent developments in dentistry have not, however, been sufficiently adopted into stomatology models and so the dental model is the one currently most favoured, with due acknowledgement to the creation and maintenance of links to other health care disciplines (3). Where traditional dental curricula have been revised to meet current needs of competency, care has been taken to ensure a proper integration of medical subjects into several areas of the dental curriculum (4). It is often not sufficient, however, merely to adopt parts of the medical curriculum for dentistry without adapting these courses specifically for dental students and other students in oral health disciplines, such as dental hygienists or therapists. One example of the need for curriculum revision is that of the changing dental needs of the elderly, in many developing as well as developed countries, where members of this section of the population have increasingly retained many of their natural teeth and require numerous special treatments in order to maintain oral health and function (5, 6).

In many countries the dentist is likely to work increasingly as leader, of a dental team comprising dental assistants, hygienists, therapists and technicians. Training of people in these complementary professions to dentistry should be integrated, at least in part, into the dental school in order to emphasise the concept of training for provision of all aspects of oral health care. Perhaps the time has come for a new name for the dental school, in order to reflect the clinical, academic and scientific changes that have occurred in recent decades. Such an institution may be better termed a school or institute of oral health.

Clinical training may be carried out in different forms not only in a distinct and separate dental school clinic/institute of oral health but also more closely linked to a medical school and general hospital. This should reflect an increase in collaboration and not, merely, a geographical link. While such collaboration may be beneficial for patients themselves as well as the professions of dentistry and medicine, it is not certain that medicine and the other health-care professions are yet prepared for increasing collaboration. Some, or even most, of the clinical training of dental health-care professionals may increasingly be carried out in community and outreach clinics (7, 8). The aim of such clinics is to reinforce the idea of training members of a

dental/oral health team and to help solve the problem of a shortage of suitable patients in traditional dental school clinics. Outreach clinics of this type should, nevertheless, be closely linked to the mother institution in order to ensure quality control of the teaching and that the dental student attains the necessary competences. It is also necessary to consider carefully how research will be integrated into dental training when the clinical work is performed in outreach clinics. Different forms of such clinics will develop, as circumstances will differ between countries and even communities within any given country. As with medical training, exposure of dental undergraduates to the work of qualified specialists in various dental fields is highly desirable as it helps students appreciate the limits of their own skills and the circumstances where referral to a specialist is necessary.

Patterns of dental health and disease vary markedly between communities, countries and world regions. This provides considerable challenges to educators as relevant subjects for teaching may vary between countries and regions within them but also will vary with time in any given area. The working group wished to emphasise this factor that illustrates the need for regular review of curricula in individual dental schools or other institutes of oral health. To this end modern communications and the establishment of networks, such as the Global Network of dental educators proposed by IFDEA (<http://www.ifdea.org>; Valachovic, personal communication) should help even under-privileged areas to keep up with relevant developments in the field of dental science and practice. Recruitment of students to dental school from geographical areas thought to be underserved with respect to dental manpower, may be an effective way of increasing the level of dental care in their home communities but this is a policy that requires constant vigilance if it is to be effective (9).

Dental education is closely linked to research in the oral health sciences (4) and as such, dental schools frequently serve as centres of excellence in this field for the communities they serve, examples would include epidemiological research and research into treatment outcomes. Furthermore, the local needs of the community where the dental school is situated often figure largely in determining the clinical material available for teaching purposes. This should then enable dental schools to tailor their teaching to the communities where the graduates will be seeking employment. The towns or cities where training is obtained as well as the place of secondary education have been shown to influence the place of practice of the dental graduate. (10, 11). Specialists are also drawn to practice in close proximity to where their training took place (12). While this may have many advantages for local provision of oral health care, dental schools need to ensure that the teaching, both clinical and theoretical, is adequate for the students to attain the necessary competences required of a new dental graduate in most or all of the major areas of clinical dentistry (13). This is particularly the case in Europe where mutual recognition of dental qualifications within the European Economic Area is mandatory and yet no checks are made on the training of new graduates or the competence of individual dentists to practise in the area of their choice. Having acquired the necessary competences for practice, the dentist should be aware of the need for continuous professional development and how to achieve this (14). The role of dental schools in providing high quality lifelong learning relevant to the community and profession was an area that the working group felt could be further developed.

With respect to graduates from underserved areas, there is a possibility that the opportunities afforded in the place of training may lure these graduates away from returning home, thus producing a "brain drain" (15, 16). This problem may only be solved with regulation or legislation but human rights issues also figure in the debate that is not confined merely to dental training. There is a need to have international policy on migration of trained manpower (17).

Specialist care and specialist training in dental hospitals

Dental schools and hospitals are often responsible for providing specialist care in most or all areas of dental specialisation. Such care sometimes requires collaboration between disciplines both within dentistry and with medical colleagues. Numerous clinical advances are also appropriately placed within dental schools and hospitals at least in the initial years of their development. This gives opportunity for advanced clinical training and research and is the environment in which further training in dentistry is appropriately placed. Here senior academics will oversee the continued development of junior and intermediate colleagues in research, teaching and clinical specialisation. The dental school and hospital thus plays a vital role in the continuing development of the profession. Such a role can only be fulfilled by the relevant authorities recognising the needs of the dental school beyond the undergraduate teaching programme and ensuring that funds, staff and facilities are appropriate for the dental school to fulfil this wider role.

Underserved areas of clinical treatment

Needs of the underserved patient

Students should be exposed to the needs of underserved patients (18, 19). This broad category of patients includes those that have been unable to obtain standard dental care within the community where they live for socio-economic reasons. In addition there are patients with special needs for oral and dental care. These patients include those with underlying diseases or disease risk that may be exacerbated by oral and dental disease as well as those patients with an underlying disease and/or taking medication that causes exacerbation of oral and dental disease. Some examples of underserved patients in this group are given below. Patients in this category may only require treatment similar to that given to ordinary healthy patients provided as a part of general dental and oral health care, while others may require special treatments such as relative analgesia or anaesthesia for otherwise routine dental procedures. There are also patients with special needs who may require special dental treatment (20), potentially throughout the life of the patient.

It is clear that dental students and other members of the dental team should be exposed to the needs of such patients in undergraduate and postgraduate training. The experience gained by the dental student from treating underserved patients is often considerable, but the working group emphasised that it should not be part of health care policy merely to allow patients from these groups to form the learning material for clinical dental students. The dental school teaching clinics should not be regarded as a means of providing low cost dental care to underserved patients. Often socio-economically disadvantaged patients, for example, have low expectations for oral health and will thus be less demanding for the type of quality treatment to which the student and the dental school should be aspiring. Compromises often have to be made but the dental student should train treating patients selected on the basis of his or her educational needs. Provision of dental care for patients not meeting the needs of teaching should be treated in the health or social services. Once a patient has been selected as suitable for treatment by a student, however, the needs of the patient should be the primary focus of the dental student and the teaching should then emphasise comprehensive care, so that both the patient and the student come to appreciate the need for achieving total oral and dental health and not just the satisfactory completion of a few specific items of treatment.

Members of the working group felt that there was a need for more time to be made available in the dental curriculum for teaching the care of patients with special needs, for researching these patients and their needs and for setting up appropriate patient care regimens suitable for teaching purposes. More pro-active teaching of the dental and oral health-care needs of underserved sections of a given population has been shown to lead to improvements in the provision of health care to these underserved segments of society, not least by the dentists on graduation (21). This issue caused some intense discussion within the working group. The need of the student to attain the appropriate diagnostic and treatment competences in order to become a modern dentist is not necessarily compatible with the need of the community to provide dental care for that community. This is especially true with respect to some patients with special needs, those with low expectancies for dental care (22) and patients unable or unwilling to undergo treatments that are, perhaps, expensive whilst being regarded as being an integral part of modern dentistry. Such a dilemma can really only be solved by the dental student carrying out procedures dictated by the need to acquire necessary competence in a wide range of dental treatments while hospital-grade staff (or equivalent) carry out those treatments that are not going to advance undergraduate training. Finance to the dental school should distinguish between the funds required for academic training and the finance required for routine clinical work that is not part of academic training. The problem of introducing dental students to the treatment of patients with special needs is increasingly covered in the literature (19, 23, 24). Such patients may provide useful experience for undergraduates if they were assisting an experienced clinician or specialist. Learning the limitations of general dental practice and when to refer patients to specialist clinics is a valuable part of dental training.

Providing for patients with special needs can be met in some situations with outreach clinics, sometimes in areas of deprivation, or in specific clinics for patients with special needs. Again some of the treatment would have value in undergraduate teaching while most would be more appropriate for clinical postgraduate training or non-academic clinical work. Setting up elective studies with patients having special needs is one way to introduce the problem to the dental undergraduate. Assisting specialists is often fruitful, but the academic training needs first and foremost to meet the criteria of clinical competence and this should have priority for the undergraduate.

Patients without ready access to dental care

Although patients may be examined, investigated and a treatment plan drawn up there was often no guarantee that this treatment would be forthcoming as many dental schools were solely teaching and research institutions without the budget to run extensive clinical services, or the obligation to treat all types of patients. This is usually a matter for the relevant health authorities and not the dental school. Providing dental services in rural and remote areas can be difficult as there is often insufficient work to keep a dentist in full employment.

Sometimes the geographical areas where patients existed that were known to require treatment were unsafe and dental students and, indeed clinical staff, were not willing to work in outreach clinics in areas perceived as being dangerous. The "Institute for Oral Health" should ensure that care is available for all sections of society and types of patient. Not all require treatment of a dentist and it should be possible to utilise other members of "the dental team", where such exists, to provide at least some types of care for these groups of patients to improve their access to care.

Types of patient

Many dental and oral diseases are strongly linked to lifestyle. Patients with special needs were often disadvantaged and unaware of the effects of their lifestyle on their general health. Often such patients have low expectancies/ aspirations with respect to their oral and dental health and are, consequently, not suitable for the purpose of teaching some of the more advanced forms of clinical dentistry. There is a dilemma in trying to resolve the educational and ethical issues in patient care that are often incompatible in the case of patients with special needs. As a result, treatment of patients with special needs is, too often, merely a subject taught theoretically without the possibility of much clinical practice. The dental school and hospital has an obligation to teach ethical considerations associated with dental practice, even if the opportunities and, especially, the necessary finance, for transferring these ethical considerations into practice in any particular dental school are limited.

Specifically, dental schools may have particular patient groups that are underserved in the student clinics.

Examples of patients with special needs that may seek treatment in a dental school:

Medically complex patients

This type of patient is increasingly encountered in dentistry and consequently the modern dental student needs to learn how to cope with the special problems (25). History taking, cooperation with medical and other colleagues in the health-care sector can help to assess the patient properly and to determine the possibilities for treatment.

Elderly

The needs of the elderly are rarely adequately represented in dental school clinics (19, 26, 27). Some provision of healthy elderly patients may be made but the institutionalised elderly patient rarely features in the patients treated in a dental school (28). While whole patient care with no age limits may be a format for teaching clinical dentistry in a manner resembling private dental practice, it is probably necessary to seek out specific patient groups, such as institutionalised patients, residents of nursing homes in order to meet the needs of a modern, broadly-based, clinical curriculum. Paedodontics is an accepted discipline within dentistry but gerodontics has not yet achieved the same level of recognition, or the necessary degree of inter-disciplinary care and interaction with medical colleagues (29).

Phobic patients

Patients with odontophobia are common, especially among those receiving little or no dental treatment. Students need to be taught to recognise these patients (30), and help them overcome their problem as well as ensure that the necessary treatment is carried out. Often there are financial problems as the extra costs and time involved in treating odontophobic patients may not be fully covered by the relevant health system.

While some educational institutions may meet the challenges of odontophobia, it is clear that this remains a serious challenge for which the new dental graduate is often ill prepared (31, 32). A consequence of this is that such patients may not be willingly

accepted by the new dental graduate in his or her own dental practice. Teaching dental student's methods of sedation may be helpful up to a point but students need also to learn that sedation is not a way to solve the problem of odontophobia in all cases.

Cranio-facial disorders

One of the most common cranio-facial disorders is that of cleft palate. The involvement of medical, dental, nursing and other specialist disciplines in the integrated treatment of these cases is necessary. Involvement of dental students, even as observers, is probably too little in many cases (33).

Balancing the needs of the patient and the teaching/ learning needs

It is important to focus on the needs of the patient. Although sometimes the patient is suitable for the student it is often the case that the student is simply available to treat the patient, without much thought being placed on the teaching or learning value of the contact. Balancing these different needs is difficult. Over-treatment, in order to meet demands of the curriculum and/ or the student, must be avoided; so should the use of students as mere service-providers. Patient-orientated teaching may be appropriate but care has to be taken to see that the student has the opportunity to demonstrate a wide range of competences. Clinical service provision, for example by trainee specialists or employed dentists may enable a teaching unit to provide necessary dental care for patients while transferring suitable patients to a student clinic for procedures that have value in training the dental student.

Costs to the patient may also limit treatment possibilities. The type of patient seeking care may not have the level of expectancies from their treatment that the dental school wishes to impart to its students. Assessment methods will need to be adjusted if a dental school moves from teaching-led care to patient-led care. Maintaining progress and high standards is difficult when the expectations of the patient are limited. Recent advances in clinical simulation may help resolve this problem by providing close-to-realistic experience of clinical procedures for which suitable patient material is not available to the dental student. Such simulation also has an important place in continuing education of the dentist.

Student experience must be recorded in order to judge the competences accumulated. Sharing patients may be necessary in order to get experience to as many students as possible although this has the disadvantage of removing the benefit for the student of having completed whole patient care.

Research

The question is often posed as to why do clinical teachers need to do research, both clinical research and basic biological research. Research is widely regarded, however, not only as being useful *per se* but should also serve as a stimulus to teaching by providing new ideas and information. Teaching of dental students should take place in a research environment. This will enable students to understand scientific methods in order to be able to have an evidence-based practice. Student research projects can be very stimulating and encouraging for staff and students.

Funding for research in dentistry is not usually of the same scale as in medicine although, again, exceptions exist. Clearly it is difficult to encourage academic staff in dental schools to carry out research if the necessary financing is lacking. Collaboration between researchers is likely to lead to more productivity in this aspect of dentistry. There should be a scientific partnership that in order to stimulate junior staff to do research where basic science is used to answer clinical problems. Research levels are perhaps lower in dental schools than other schools/departments within any given University but there is certainly a huge variation between output of research between countries (34). It is not surprising that larger countries produce more research in total but smaller countries tend to produce more publications per capita. The working group agreed that the research profiles of dental schools should not be identical to one another but particular research strengths should be encouraged wherever they exist. Scientific quality as measured by weighted impact factor gave results not entirely consistent with quantity in the study of Gil-Montoya *et al.*, (34). Often basic biological and materials science is strong whereas clinical research to the doctoral (PhD) level is less strong. However, exceptions to this certainly exist, however. Student research projects are often stimulating to the student but finding supervisors is difficult and funding is usually a problem. Furthermore, there is no clear answer to the question as to whether or not student research leads to an increase or decrease of the overall research activity of the Dental School.

The increase of MS and PhD students from less developed areas of the world developed countries may establish links for the future and help speed up the development of dental schools in less developed countries. Collaboration between developed and developing countries for research purposes should always meet exacting the ethical standards expected of the developed country. In order to guarantee that no exploitation is occurring in the research, it should clearly be for the mutual benefit of both communities.

Promotion within dental schools based purely, or largely, on research is not a good thing as there are so many areas within dentistry that should be stimulated by promotion. A career pathway should include teaching, research and clinical practice with flexibility to concentrate on any one or more of these.

The International Association for Dental Research has a variable membership fee structure (see <http://www.iadr.org>) that is based upon the wealth classification of the World Bank (<http://siteresources.worldbank.org>). This means that members from the poorest countries of the world only pay a registration fee that covers the marginal cost of being a member. This type of policy is helpful in trying to balance out some of the problems faced by low resource countries in attempting to participate in the world forum of dental research. Access to journals in printed or electronic formats is also a problem for many dental schools in underserved areas of the globe. Cooperation between countries or regions in dental research is a potent method of stimulating the underserved communities. Strategies are urgently needed for collaborative research efforts between the developed and developing areas of the world in the various fields of dentistry.

It is to be hoped that the inequalities present today in the provision of dental care, provision of dental education and the quantity and quality of dental research will be

reduced considerably in the near future through active international collaboration and the application of knowledge already acquired by one section of the population to assist and speed development in those areas of the world and population groups where the best current knowledge and practice is not yet fully applied.

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