PART 1: INTERPROFESSIONAL CARE AND THE DENTAL PROFESSION

# Interprofessional Dental Care: An International Perspective

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**Abstract:** *The COVID-19 pandemic enhanced the known importance of good interprofessional communication and cooperation to ensure proper patient care. In dentistry, there is often no proper integration across teaching, research, and care. There is too little communication and cooperation among the members of the dental team and the health care team in general. There is a critical need to improve coordination and cooperation among dental professionals and with medical professionals in general. Health in all policies should include addressing interprofessional medical and dental care at all stages of professional human resource training and service planning. Dentists should play a leadership role since they are frontline professionals in the prevention, early detection, and treatment of oral and systemic diseases.*

**Knowledge Transfer Statement:** *Postgraduate dental training programs can use the recommendations from this article to improve clinical teaching and ensure the education and competency of dental residents.*

**Keywords:** schools, universal health insurance, universal health coverage, multidisciplinary team, curriculum, multidisciplinary health team

## Introduction

Interprofessional dental care has been a topic of discussion for many years at the associational and governmental levels. Interprofessional health care in general has been discussed for many years. In 2010, the World Health Organization (WHO; 2010) stated that "collaborative practice (CP) strengthens health systems and improves health outcomes. CP in healthcare occurs when multiple health workers from different professional backgrounds provide comprehensive services by working with patients, their families, carers, and communities to deliver the highest quality of care across settings."

This vision was shared by the FDI World Dental Federation (2015) regarding dental care, which claimed that "dentists are the front-line medical professionals in the prevention, early detection, and treatment of oral and systemic diseases. They should therefore play a leadership role within the oral health profession and in relation to other health professions to improve oral health and thereby contribute to the improvement of general health and quality of life for all." FDI promoted CP because, "in terms of service delivery, CP improves access and quality. Furthermore, CP involves costs. The evidence also indicates that CP improves mutual trust and accountability among providers and results in better coordinated care."

Historically, the doctor and dentist have been responsible for treating patients, teaching apprentices, and publishing fruits of research for the common good. Nevertheless, in many countries, the relevant institutions have developed separately, which is true more so in dentistry than in medicine. Medical schools teach in hospitals that provide (secondary) medical treatment to the community. Dental schools usually provide clinical treatment to patients needed for the training of the undergraduate students, but often, they are not part of the treatment network to the community. In addition, in many countries, such as Sweden, Latvia, Finland, and the United States, dental research institutions that are devoted

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solely to research have been founded. Therefore, interprofessional practice is not only a suggestion to meet the need for harmonization and the sharing of best practices but also a paradigm shift in the provision of service.

The present situation in 2 countries is described here.

## Israel

### Primary Dental Care

For children up to the age of 18 years, primary dental care is provided in the community by 4 health management organizations (HMOs) as part of the universal health coverage (UHC) provided by the national health insurance law (NHIL; Natapov et al. 2016). Dental care is provided in HMO clinics and contracted private clinics. Similarly, they provide the dental care ensured by law for elderly individuals from 72 years of age and older.

### Dental Education

There are 2 dental schools in Israel. One is an independent faculty at the Hebrew University of Jerusalem, and the other is a school in the Faculty of Medicine at Tel Aviv University. Both schools educate dental surgeons, and the number of accepted students beginning in their first year is increasing. The facilities are similar, as the clinical teaching is done in the dental school building situated in a well-off neighborhood (Tel Aviv) or the outskirts of the town (Jerusalem). While they are prepared to provide primary dental care (Faculty of Dental Medicine 2023a; School of Dental Medicine 2023b), they are not contracted by HMOs for primary care treatments to the age groups eligible by law (children from birth to age 18 years and elderly individuals aged 72 years and older). With respect to treatment for the general community, they are not situated in the neighborhood where they are needed most; thus, accessing prospective patients is not easy for the dental community. The dental school in Jerusalem provides shuttle services for children from near-Jerusalem villages to provide enough patients for its students. Student treatment of the adult population is offered at a very low price, mainly to cover expenses such as materials and laboratory work. Secondary care (complex dental treatment or complex dental cases) is provided at dental schools but by registrars (residents) rather than students.

### Dental Research

Both schools have a robust research institute and regard it as an important part of their activity (Faculty of Dental Medicine 2023b; School of Dental Medicine 2023a).

### Integration

While there could have been easy interprofessional integration in dental care, the UHC did not solve it and may have even widened the gap. The NHIL entrusted dental treatment to the 4 HMOs. The HMOs do not see dental education (not even postgraduate) as their responsibility. Additionally, they feel that the NHIL does not allow them to provide community care by professionals who are not properly licensed. The proper (legal) way to solve this problem has not yet been identified. Research has been conducted in general hospitals but has rarely been conducted in dental clinics.

### Dental Hygienists

Dental hygienists are recognized and licensed professions in Israel. Historically, they were educated only in dental schools alongside dental students but with minimal interaction or joint courses. Currently, there are options for education in colleges independent from dental schools. This situation occurs because, legally, dental hygienists can practice only under the supervision of a dentist. These 2 professions are integrated in the teaching phase by a multidisciplinary team.

### Medicodental Interprofessional Cooperation

Despite the fact that the dental school is an independent faculty at the Hebrew University, adjacent to the Faculty of Medicine, interprofessional teaching is currently limited. Fifty years ago, in my student years (S.P.Z.), we studied in the preclinical years with medical students, with most classes in the medical school building. Since then, the format has changed, and the number of joint courses has slowly decreased. At Tel Aviv University, the dental school is part of the Faculty of Medicine, yet teaching has been separated since it was established.

The specialization curriculum of oral and maxillofacial surgery (OMS), oral medicine, oral pathology, and pedodontics includes compulsory clinical training in various medicine disciplines and dental public health registrars' studies for a master of public health. For the other specialties, clinical training in medical disciplines is optional and rarely chosen.

Historically, OMS has been the most prevalent dental department in general hospitals in Israel. It practices in an interprofessional way. It has recently become prevalent among OMS surgeons to earn an MD diploma after specialization since this allows them a freer practice without requiring assistance from a medical professional in some operations. Since the 2010 reform in dental care in Israel (Natapov et al. 2016), there has been an ongoing effort by the Division of Dental Health to add pedodontics and oral medicine services to general hospitals, but this is a slow and painstaking process with fierce competition for posts. At present, only half of general hospitals provide dental services.

With respect to community care, dental and medical services are separate, except in Meuhedet HMO (caring for approximately 15% of the population), where they are usually in the same establishments.

## Italy

### Primary Dental Care

For children up to the age of 18 years, primary dental care is provided by the

National/Regional Health Service (NHS/RHS). However, there are differences among regions. Dental care is mainly provided by private solo dental practices, but the number of group practices is growing.

### Dental Education

There are 34 dental schools in Italy. Some are private institutions, but the majority are public universities that are usually connected with a hospital structure. Most schools educate dental surgeons and hygienists, as well as specialists in orthodontics, pediatric dentistry, and oral surgery. There are various continuing education and further study opportunities, such as microscopic endodontology, implantology, and aligners, which are usually connected with research or industrial activities in the territory.

Most schools provide dental care to the population in their neighborhood as a contract with the NHS/RHS, forming part of their remit for the usage of structures owned or borrowed by the NHS/RHS. In these hospitals, dental and medical care is provided in the same setting as UHC. This is important for the exposure of trained students to compromised health conditions, especially for underserved/fragile populations and developmentally disabled populations. Some limitations remain present for unregistered migrants or "rough sleepers" (i.e., those who sleep outside or in places not intended for habitation) at the institutional level, as only emergency services are provided as UHC; however, volunteer associations are trying to cover this aspect while dental/interprofessional care forms part of integrated care. Similarly, patients in need of special care benefit from more interprofessional care, as most medical and dental care is part of a specific pathway to book all appointments without any bureaucratic delay for these patients, clearly showing that interprofessional care is possible but organizationally demanding.

According to the recently approved law on state examinations, a candidate has to provide evidence of a number of hours of training for patients during the 6-year course of their dental degree (similarly, during the 3-year course of dental hygiene), which must be examined with local order institutions with a special consideration of ethical behavior.

### Dental Research

All schools have a robust research tradition and regard it as an important part of their activity.

### Integration

Postgraduate programs are planned together by universities and the NHS/RHS, so postgraduate students are integrated into a hospital's interprofessional environment. Therefore, formally, it is feasible to train young staff in clinical situations according to the WHO-requested integrated conditions, but there is an increase in territorial integration to reduce hospital congestion. Regional governments are funding this "breaking the walls of hospitals" after the COVID-19 outbreak. The availability of intermediate-level operators is still under discussion and planning.

Private practitioners are already offering integration in the dental care of other medical and sanitary professionals, as it is currently being requested by patients. This might represent a viable model to induce the public sector to develop a similar evolution.

### Intraprofessional Integration

Dental teaching is traditionally a discipline-based profession, according to the Institute of Medicine (IOM; IOM Committee on the Future of Dental Education and Field 1995: 102). It has a "specialist role model, student-centered instruction, segmented patient care, procedure focus with numerical requirements." The dental student should learn the care provided by a general dentist: "generalist role model, patient-centered education, continuity of patient care, evaluation and management focus with competency criteria." Dental research is a basic mission of dental teaching, and they are usually integrated.

The service side was the third aspect incorporated. With advances in medical and dental research, sophisticated technology and demand for high-quality medical care in medical centers and hospitals have increased the importance of university medical centers and medical profession schools, and patient care has evolved in a distinct way. Dental schools must regard patient care as a "distinct mission that is related but not subservient to the missions of education and research" (IOM and Field 1995: 174).

Dental schools' teaching and clinics are student and performance centered, not patient centered. The schools teach students to provide patient-centered treatment from a student-centered perspective. Patient-centered care involves all aspects of service, including valuing patient time, scheduling appointments, and setting up clinics.

One possible solution to better integrate the service side is for dental schools to have satellite clinics (outreach opportunities) in the community in which students, as part of their undergraduate training, provide dental services under the guidance and supervision of faculty. This brings the service to the community and makes it more accessible. Several dental schools use this option. This solution was proposed and discussed at the Jerusalem Dental School; it has not yet been implemented, although the university senate voted for closer relationships with the community. As expected, the main problems were raised by the teaching faculty; this is a lesser problem when trainee specialists (licensed professionals) are involved.

New or recent graduates from UK dental schools must complete a 1-year program of dental foundation training to be on the National Health Service (NHS) Performers List. Placement on the list allows dentists to treat NHS patients in general dental practice (NHS England 2022). Although it is not part of the required training for licensure, regulators felt that additional practice is needed by the new graduates in the service aspect to provide high-level treatment.

Supervision is provided by approved practitioners, not necessarily by dental school faculty.

### Interprofessional Integration

The WHO (2010) reported that "interprofessional education is a necessary step in preparing a 'collaborative practice-ready' health workforce that is better prepared to respond to local health needs. Interprofessional education occurs when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes." According to Donnoff (2017), the motif of the Harvard School of Dental Medicine is as follows: "The school's mission is 'to develop and foster a community of global leaders dedicated to improving human health by integrating dentistry and medicine at the forefront of education, research, and patient care.' At commencement, dental graduates are welcomed into a 'demanding branch of medicine.'"

In most other settings, dental and medical teaching is largely separate. The history of how and why this happened is described in the IOM report (1995: 35–42). There is some integration in postgraduate teaching, as shown earlier, mainly in oral and maxillofacial surgery, as in Queen Mary in London (Faculty of Medicine and Dentistry 2023).

In several countries, the integrated educational structures are called a *medical and dental school*—for example, at Queen Mary in London and KNUST in Ghana (Kwame Nkrumah University of Science and Technology; College of Health Sciences 2023). This is a promising sign, although it does not ensure integrated curricula. In Europe, there is a similar variety of medical integration into dental schools, with a slowly growing trend.

The situation regarding integrated dental and medical teaching in Europe would be completely different if the harmonization of higher education in the European Union (European Economic Community at that time) had taken a different path in 1978 (Bánóczy 1999). In Portugal, Spain, Italy, and Austria (and Hungary until 1952), "stomatological dental education in Europe was based on the general medical diploma, which considers oral medicine to be equivalent to any other medical specialization" (Bánóczy 1993). According to Bánóczy, "the esteem with which stomatologists were held by medicine was higher in these countries than in other countries where dentists were educated independently. However, in the stomatologists' countries, the prevalence of dental caries and periodontal diseases peaked by the last third of the 20th century, in contrast to other countries where independently educated dentists were working."

The IOM committee (1995: 108–9) suggested "closer integration" based on "educational and clinical substance." This includes the following elements:

> 1. Dental students would take basic science courses that would be the same as or similar to those taken by medical students. . . .
>
> 2. Basic science courses for dental and medical students . . . would include conditions or problems relevant to oral disease and would not, in any case, be divorced from clinical care.
>
> 3. Dental students would have required clerkships in relevant areas of medicine (the way trainee specialists do).
>
> 4. Dental faculty have sufficient experience in clinical medicine so that they can impart medical knowledge to dental students.
>
> 5. Dental licensure examinations should be redesigned to increase the emphasis on critical thinking and clinically relevant knowledge of systemic disease and physiology.

The services provided to patients can improve and be made more accessible by joining forces with public health nurses. For example (Morón and Singer 2023), a

> synchronous videoconference training program was effective for increasing the oral health knowledge of participating school-based nurses. Moreover, the nurses effectively applied their acquired knowledge in delivering preventive oral health measures to children in public elementary school settings. Given the high prevalence of untreated dental caries among low-income, public schoolchildren, it is clear that public school-based nurses are key partners in efforts to increase access to oral health care for these vulnerable and underserved children. The results obtained in this study suggest a viable opportunity to increase state, school, and community partnerships to address the imperative of reducing oral health disparities and barriers to oral health care access.

Another example showed that public health nurses "believed that oral health preventive services should be incorporated into their daily work. During in-depth phone interviews, nurses stated that the integration of the program into their busy daily schedule was realistic and appropriate" (Natapov et al. 2018). The nurses "readily embraced the simple caries risk assessment tool and it became an integral part of their toolkit."

The same applies to elderly patients. It is time for them and for their dentists to learn new habits (Zusman and Mersel 2023). In a simple trial by Mullan et al. (2023), all pharmacy, dental, and dental therapy undergraduate students reported increased reflective competence in interprofessional work following a 2-hour gerodontology case-based workshop. Dentists and nurses view their collaboration as indispensable for promoting the oral health of nursing home residents. Hamacher et al. (2023) described a lack of time and competence in the oral and dental care of home residents, which should be countered with new roles of responsibility for specially qualified nurses in cooperation with dentists. According to Mara (2023), "existing models of interprofessional practice in geriatrics such as adult day programs, nursing homes, long-term care facilities, home care, and simulated learning experiences are avenues to implement interprofessional education (IPE) experiences."

Another example of improved service to patients due to close cooperation between dental and medical professionals was observed during the COVID-19 pandemic, as described by Natapov et al. (2021). At the beginning of the pandemic, only emergency dental treatments were provided. The close cooperation concluded that "the risk of SARS-CoV-2 transmission within the dental setting was low, and the adherence to national infection control guidelines was high. Elective dental care was safely delivered during the pandemic."

FDI (2015) shares the WHO approach and "recognizes that there is no one-size-fits-all approach and that delivery of health services will depend on contextual factors and country needs. The dental profession should be recognized as a driving force behind CP. The dental profession should be part of political dialog at the national and global levels, and recognized as a central driving force behind the development of competencies for CP and the implementation of any CP model."

### Larger Perspective

If we look at the issue in a broader context, the science itself currently has to "reorganize." The International Science Council's report (2021) states that "understand and frame current global challenges as intertwined natural and social problems, and therefore give prominent leadership roles to the social sciences, arts, and humanities, without negating the important contributions from physical, natural, engineering, medical, and other applied sciences." Dental health is an integral part of the 5 main missions:

> Food: eating adequate, healthy diets without consuming nature's bounty
>
> Water: replenishing natural reservoirs to provide enough clean water for all
>
> Health and well-being: being whole and well in body, mind and nature
>
> Urban areas: thriving in places while stewarding the natural environment
>
> Climate and energy: shifting to clean energy while restoring a safe climate

The task is not easy for universities, as stated by the European Network of Innovative Universities (2022) in its note on interdisciplinarity:

> Due to the dominating academic traditions and structures, the vast majority of researchers and students act in a system which is fragmented and departmentalized. This makes it increasingly difficult for universities to contribute sufficiently to solving complex global challenges, which require a mindset based on a cross-disciplinary and nonlinear understanding of reality. Communicating, thinking and acting across disciplines and professions needs to become a common working method at universities without negating the importance of single disciplines.

Their suggestion is as follows:

> It is strongly recommended to create effective structural incentives for renewing the academic mindset toward accepting and practicing serious communication across disciplines. This is the main challenge that we need to overcome to be able to reach a truly new wave of innovation and implement new innovative structures around research, education, and collaboration with all sectors of society to promote innovation from a broad perspective.

### Artificial Intelligence

Undoubtedly, artificial intelligence (AI) is the next "big thing" in our private and professional life. AI already has to be integrated into professional education since "a deeper, more reliable and accurate understanding of our patients' health and conditions may allow a more targeted prediction-based assignment of therapies. Care may become more precise and personalized, with greater effectiveness and safety. Moreover, AI may allow services at higher scale and efficiency to be provided by a more diversified workforce" (Schwendicke et al. 2023). Dentists who understand AI language are able to communicate more directly with other professionals.

## Conclusions

There is wide consensus that to achieve interprofessional health care, integration should start in the training phase—that is, in medical schools, dental schools, and nursing schools. Unfortunately, most natural tendencies are counterproductive to this goal. Therefore, international, orchestrated, synchronized organizational initiatives are needed.

Health in all policies should include addressing interprofessional medical and dental care at all stages of professional human resource training and service planning. Dentists should play a leadership role since they are frontline medical professionals in the prevention, early detection, and treatment of oral and systemic diseases.

## Author Contributions

S.P. Zusman, C. Paganelli, contributed to conception and design, data acquisition, analysis, and interpretation, drafted and critically revised manuscript. All authors gave their final approval and agreed to be accountable for all aspects of the work.

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