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## Perspective

## Dental curriculum for medical students in Taiwan: A preliminary survey

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Since the Taiwan Government Medical School (established in 1899) included the dentistry subject into its medical curriculum for medical students in 1918, it had opened a new era of inclusion of dental curriculum in medical

education in Taiwan. Until the end of the Japanese colonial period (1985–1945), medical students in Taiwan were required to take the course of dentistry. Although the dental curriculum for medical students at that time had the function of allowing them to be qualified to perform dental services after becoming physicians and such a medical education system no longer existed after the World War II, this tradition was continued to maintain in the medical school of National Taiwan University (NTU) after the war, and medical students of NTU also had to take the course of “Introduction to Dentistry” until 2011.<sup>1,2</sup> The dental curriculum in the medical school could provide medical students with an understanding of dental-related diseases and the scope of stomatology, which acted as an important

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**Table 1** The basic information of dental curriculum for medical students in Taiwan in the 2022 academic year (2022–2023).

Course title	Grade	Semester	Required or elective	Number of credits	<sup>a</sup> Responsible instructor's specialty	<sup>b</sup> Composition of teachers	<sup>c</sup> Course content	Teaching method	Grading	Course material
<b>School of Post-Baccalaureate Medicine</b>										
1. Kaohsiung Medical University (a private university in the south of Taiwan with a dental school on the same campus)										
Dental Medicine Introduction	3	Second	Required	1	FD	Type A	B, D, E	Lecture <sup>d</sup>	Final exam	Handouts
2. I-Shou University (a private university in the south of Taiwan without a dental school on the same campus)										
	3	Second	Required	2	OS + FD	Type B	A, B, F	Lecture	Midterm exam, oral presentation, #hand-on practice, participation	Handouts, reference books
<b>School of Medicine</b>										
1. National Cheng Kung University (a public university in the south of Taiwan with a dental school on the same campus)										
Introduction to Oralogy	4	Second	Required	1	OS	Type A	A, B, E	Lecture	Final exam, participation	Handouts
2. Chung Shan Medical University (a private university in the central region of Taiwan with a dental school on the same campus)										
Introduction to Dentistry	2	First	Elective	2	OS + OP + SND	Type A	B, C, E	Lecture <sup>e</sup>	Final exam	Handouts, reference books
3. China Medical University (a private university in the central region of Taiwan with a dental school on the same campus)										
Introduction to Dentistry	4	Second	Required	1	Prosthodontics	Type A	B, E	Lecture by asynchronous online learning	Midterm exam, final exam, written report, participation	Handouts, reference books
4. Kaohsiung Medical University (a private university in the south of Taiwan with a dental school on the same campus)										
Dental Medicine Introduction	5	Second	Required	1	FD	Type A	B, D, E	Lecture <sup>d</sup>	Final exam	Handouts
5. Fu Jen Catholic University (a private university in the north of Taiwan without a dental school on the same campus)										
Introduction of Oral Medicine	4	Second	Elective	2	Endodontics + FD	Type C	B, C, E	Lecture	Final exam, written report, participation	Handouts
6. MacKay Medical College (a private college in the north of Taiwan without a dental school on the same campus)										
Introduction to Oral and Maxillofacial Medicine	4	First	Required	1	OP + FD	Type D	B, E, F	Lecture	Midterm exam, final exam, written report	Handouts, reference books

#Hand-on practice included wire fixation technique and oral examination.

<sup>a</sup> The abbreviations of various specialties of dentistry were shown as follows: oral and maxillofacial surgery (OS), oral pathology (OP), endodontics (Endo), prosthodontics (Prosthodontics), family dentistry (FD), and special needs dentistry (SND).

<sup>b</sup> Composition of teachers was shown as follows Type A: Lots of dental school teachers Type B: A chief dentist of the university-affiliated hospital (E-Da Hospital) Type C: Lots of dentists from another medical center (Shin Kong Wu Ho-Su Memorial Hospital) and a dentist of the university-affiliated hospital (Fu Jen Catholic University Hospital) Type D: Two dentists from a medical center (MacKay Memorial Hospital) with the same system as the college.

<sup>c</sup> Course contents were shown as follows: A: Oral structure and function B: Oral diseases and treatment C: The relationship between oral diseases and systemic diseases D: Oral clinical manifestations in patients with systemic diseases E: Introduction to various specialties of dentistry F: Tooth-numbering system.

<sup>d</sup> Medical students from the school of medicine and those from the school of post-baccalaureate medicine were taught in the same class.

<sup>e</sup> Medical students (2 year-grades) and dental students (1 year-grade) were taught in the same class.

bridge between medical and dental educations. At present, some medical schools in Taiwan still provided dental courses to their medical students. In this article, we searched and analyzed the information related to dental curriculum for medical students in Taiwan in the 2022 academic year (2022–2023).

In addition to 3 newly-established schools of post-baccalaureate medicine in 2022, currently, there were 2 schools of post-baccalaureate medicine and 13 schools of medicine in Taiwan. Among them, there were 8 universities with both medical and dental schools. In this analysis, the course inquiry systems from websites of all universities with medical schools were used to filter their dental curriculum for medical students in Taiwan in the 2022 academic year. Of all schools, 2 (100%) schools of post-baccalaureate medicine and 6 (46.15%) of 13 schools of medicine offered dental curriculum for their medical students in Taiwan in the 2022 academic year. Moreover, 4 (50%) of 8 schools of medicine with a dental school on the same campus and 2 (40%) of 5 schools of medicine without a dental school offered dental curriculum to medical students. The basic information of these dental curricula is shown in Table 1. Because 2 classes (one class had medical students from the school of medicine and the other class had medical students from the school of post-baccalaureate medicine) in Kaohsiung Medical University were combined for the teaching convenience, there were totally 7 classes that provided dental curriculum for medical students in the 2022 academic year. These dental courses were mainly offered to senior (4th year-grade and above) medical students. Of the 7 classes, the dental curriculum was a required course in 5 and an elective course in 2. Moreover, the number of credits for the dental curriculum for medical students were either one or two credits. The responsible instructors for teaching the dental curriculum were all dental specialists with 1–3 specialties. Among all the responsible instructors, 4 had specialty of family dentistry, 3 had specialty of oral and maxillofacial surgery, 2 had specialty of oral pathology, one had specialty of endodontics, one had specialty of prosthodontics, and one had specialty of special needs dentistry. In term of composition of teachers, all 4 medical schools with a dental school on the same campus used their dental school teachers to teach this dental course. However, the other 3 medical schools without a dental school on the same campus used senior dentists from their university-affiliated hospital or other medical centers for teaching this dental course. We summarized 6 main topics of the dental course contents taught in the 7 classes in Table 1. Of the 7 classes, oral diseases and treatment was taught in 7 classes, introduction to various specialties of dentistry in 6 classes, oral structure and function in 2 classes, the relationship between oral diseases and systemic diseases in 2 classes, tooth-numbering system in 2 classes, and oral clinical manifestations in patients with systemic diseases in one class. It should be noted that the analysis was based on the description of dental course found from the websites, and actual teaching contents might be adjusted. Moreover, lectures were used as the main teaching method in the 7

classes, and lecture by asynchronous online learning was used in one class. In most classes, multiple assessments were used for grading, while all classes used handouts (self-made teaching materials) as the major teaching materials.

The primary medical staff including primary care physicians have very little learning on treating oral health problems or maintaining good oral health, although they are more numerous in number than dentists and should be taught to address disparities in oral care. They could play an important role in helping prevention of oral diseases and improving access to oral care for their patients.<sup>3</sup> In a 2009 national survey of 88 medical schools in the United States, 9 (10.23%) of 88 medical schools did not offer any oral health courses for their medical students.<sup>4</sup> According to our findings, in Taiwan, the opportunity was indeed very rare for medical students to learn about oral medicine. Of the 13 medical schools, 7 (53.85%) did not offer any oral health courses for their medical students, indicating that the problem of separation of medical and dental educations is very serious in Taiwan. However, currently only dental courses of 1–2 credits were offered to medical students in Taiwan. In order to provide complete medical care including oral care to the patients, the cooperation between medical and dental staffs is often required. The dental course can provide knowledge that bridges oral health to total body health.<sup>5</sup> Especially, the tooth-numbering system is a common language of communication between physicians and dentists, but it was rarely taught in the medical schools in Taiwan. It is indeed a big challenge to achieve such a great goal just by learning the oral medicine course of 1–2 credits only. For this reason, developing a consistent standard of syllabus and teaching materials for the dental course for medical students and promoting it in the medical schools in Taiwan is a precise direction in the future. In fact, a comprehensive dental specialist system has been implemented in Taiwan, and a wealth of professional dental teachers can be expected. Therefore, a well-planned dental curriculum for the medical students is an achievable goal.

## Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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