

# Dental Education and Research Priorities in Kazakhstan

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Dental education is one of the important part of medical education in Kazakhstan. There are four Dental Schools in Kazakhstan. The Doctor of Dental Medicine (D.M.D.) and Doctor of Dental Surgery (D.D.S.) degrees are identical with respect to educational curriculum. Both degrees indicate that the graduate is prepared to practice as a general dentist. The curriculum for both degrees is set by the Ministry of Health of Kazakhstan. Dental school programs leading to either the D.M.D. or D.D.S. degrees are five years long, but from next year in accordance with Kazakhstani new national reforms of educational and health care systems implemented in 2005, 1 year internship will be included. It is well known that the ideal primary health care system for each country depends upon the socioeconomic development and the health status of the population. Primary health care-centered system in one of the main priorities of our new health care program. For all medical academies, including dental schools, own medical centers will be established by governmental financial support. Dental school programs will be 6 years long, including 1 year intensive clinical internship. After dental school, some dentists may choose to pursue a specialty within dentistry. This requires extra training in the form of fellowships. Some of the specialty options are orthodontistry, periodontistry, and oral or maxillofacial surgery.

Students that intend to apply for dental school must take the Integral National Admissions Test (INAT). Ministry of Education and Science establishes which scores from this exam are acceptable for admission into any dental school. The INAT covers basic natural sciences, reading comprehension in the natural and basic sciences, quantitative reasoning and perceptual ability. The INAT is normally taken several months prior to applying for dental school. A personal statement in which the applicant shares with the admissions committee their motivation for attending dental school as well as any strengths they will bring as a student is also required.

Generally, the first two years of the dental program will be spent on the biomedical sciences. These years are considered "pre-clinical" and focus on oral diagnosis and treatment. The subjects covered typically include anatomy, biochemistry, embryology, physiology, histology and pharmacology. The three clinical years of the dental programs are spent treating patients with a variety of oral diseases under the supervision and guidance of the faculty. This part of the training is usually carried out through rotations in the various clinical settings available to the medical academy. Semipalatinsk State Medical academy has own dental clinic. There are also programs

that allow students to pursue the master of science (M.S.) or doctor of philosophy (Ph.D.). Students that obtain both a dental and Ph.D. degree typically pursue careers in academic dentistry.

## Dental Research Priorities in Kazakhstan

The Ministry of Health of Kazakhstan and Dental School of the Semipalatinsk State Medical Academy established some research priorities for the period spanning 2002 to 2007. Those priorities were:

1. Congenital Oral and Craniofacial Diseases in the area adjacent to the Semipalatinsk Nuclear Test Site
2. Some clinical features of Dental, Oral and Craniofacial Disorders in the Semipalatinsk Region of Kazakhstan
3. Clinical Approaches to the Diagnosis, Treatment and Prevention of Dental, Oral and Craniofacial Disorders

The experts focused on oral infectious and inflammatory diseases, host-bacterial interactions, mucosal immunology. Some features of induction, development and clinical manifestation of dental and oral disorders, including various congenital diseases, caries, periodontal diseases, mucosal infections, oral cancer, and infectious diseases with oral manifestations have been studied among exposed and non-exposed population in the Semipalatinsk Region of Kazakhstan in comparison with other regions. Recent research projects also focused on the repair of hard and soft tissues, and tissue engineering, genetic research. Other topics were craniofacial anomalies and developmental biology, oral cancer research, pain research, and autoimmune disease, including the study of the oral manifestations and complications of genetic conditions and of chronic systemic diseases and disorders such as cardiovascular disease, pulmonary disease and diabetes, and the impact of oral disease on systemic health. The experts suggested that the interaction between oral health and systemic diseases are very important issue. It was noted that prevention of oral, dental and craniofacial diseases should be under special control of the Ministry of health and local dental clinics.

There are various training programs in dental research of Kazakhstan, including a Master's in Clinical Research and Ph.D. degree program. Semipalatinsk State Medical Academy in collaboration with the Dental School of Hiroshima University proposed at the first time the Ph.D. degree program, which is very helpful for Kazakhstani young specialists.

Master's programs in clinical research should be

very rigorous to solve the current deficit in well-trained clinical researchers and clinical practitioners.

Our experts together with specialists from Dental School of Hiroshima University (professor T. Okamoto) have done some joint research projects in the area adjacent to the Semipalatinsk Nuclear Test Site. Molecular-epidemiological study of oral and maxillofacial disorders among the residents of the Semipalatinsk Nuclear Test Site area was a first International study of this kind in Kazakhstan. The purpose of that study was to investigate a possible relationship between long-term radiation exposure by nuclear testing and predisposition of oral and maxillofacial disorders among residents from regions adjacent to the Semipalatinsk Nuclear Test Site (SNTS).

Screening study included an examination and assessment of oral cavity condition and dental disorders, interview on residential and health history, nationality, as well as oral hygiene, nutritional and smoking habit, review of local primary public health clinic documents, blood sampling for genetic research. The study strongly suggested that the inhabitants in exposed villages adjacent to SNTS might be considered as a population at risk for high frequency of cleft palate and tooth loss due to the radiation exposure. This study also suggests more detailed molecular research of the nature of dental disor-

ders in the area surrounding the SNTS. Exposed inhabitants with oral and dental disorders from villages adjacent to the SNTS are really needed a specially designed rehabilitation program. Unfortunately, providers in rural primary care settings have an unacceptably small understanding of evaluation of exposed patients and what is available for their appropriate diagnosis and effective treatment.

We are planning from next year to conduct research on genetic and environmental determinants that affect oral health. Also oral care needs of the HIV/ AIDS population issues of interest to our dental school. The Ministry of Health of Kazakhstan and Ministry of Education and Science will provide scholarships for students that desire to enter fields of academic dentistry and improve the research base within the dental fields. This would also encourage all dental school students to study abroad to get Ph.D. degree in foreign universities. Partnerships and research collaboration will be established with leading foreign universities and dental schools, which will benefit to the world scientific and academic community. We trust that our research and clinical collaboration with the Dental School of Hiroshima University will be deeper and more fruitful at the nearest future.