

The East Carolina University School of Dental Medicine's Approach to Dental Workforce Education and Reaching Underserved Areas

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Access to preventive and oral health care services in many areas of our state remains problematic. This paper discusses oral health needs of North Carolinians and how a new model of dental education at East Carolina University addresses these issues by providing care where it is most needed.

Dental caries remains the number one chronic disease of childhood, even though it is entirely preventable. Nearly 40% of North Carolina kindergarteners have caries in primary teeth by the time they start school [1]. Oral health problems also impact many adults in the state. North Carolina's Behavioral Risk Factor Surveillance System (BRFSS) reported that, in 2008, 21.3% of all residents 65 years of age and older had had all of their teeth extracted [2] and about half (47.8%) of all those 18 years and older had had permanent teeth extracted [3]. More than 69,000 visits to North Carolina emergency rooms in 2009 were related to oral health problems, with disorders of the teeth and jaws as the 10th most common reason for all emergency visits [4].

The need for care is great, but access to oral health care services in many areas of the state remains problematic. The growing gap between the oral health needs of the people in our state and the capacity to meet those needs is dependent on many factors; however, the availability of a dentist and the dental team is fundamental. A new model of dental education at East Carolina University (ECU) offers an opportunity to provide care and contribute to the growth of a responsive oral health care workforce.

North Carolina's Dental Workforce

The majority of North Carolinians enjoy good oral health and benefit from a well-prepared private practice workforce that, over the years, has provided excellent care and has successfully improved oral health in the state. Historically, however, a significant portion of the population has not been able to access adequate care. Dental education can play a significant role in addressing this need.

North Carolina ranks 47th nationally in dentists per capita, with the lowest ratios in rural areas of the state [5]. According to Census data, North Carolina is the fifth fastest growing and the 10th largest state in the country [6]. It is projected that it will be the seventh largest state in the country with a population over 12 million people by 2030 [7]. Maintaining a dental workforce that can meet these rising demands is paramount to the oral health of the state's population.

In the 10-year period ending in 2007, the number of dentists in 44 counties did not keep pace with the growth of the population [8]. The Cecil G. Sheps Center for Health Services Research at the University of North Carolina (UNC)-Chapel Hill reports that the dentist to population ratio for the state was 4.4/10,000 in 2009 compared to the national average of 6.0/10,000. Even with increased enrollment in the UNC-Chapel Hill School of Dentistry and the addition of the ECU School of Dental Medicine graduates in 2015, the Sheps Center projects a decline in the number of dentists in the state to 4.2/10,000 by 2015; this ratio is expected to remain until 2020 [9].

The state's population is almost evenly divided between 15 urban and 85 rural counties [10], but the dentists are concentrated (5.7/10,000) in the urban counties (Katie Gaul, North Carolina Health Professions Data System, written communication, May 10, 2012). The rural counties lag far behind with only 3 dentists for every 10,000 people, a ratio that has been virtually the same since 1979. There are 28 counties where 2 or fewer dentists serve as many as 10,000 people (ie, the dentist to population ratio is $\leq 2/10,000$ population). Four counties including Tyrell, Camden, Hyde, and Gates¹, all in the eastern part of the state, have no dentist at all [8]. In rural and underserved areas, primary care dentists

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¹According to the North Carolina Health Professions Data System, preliminary 2011 data and local correspondence indicate that there is now a dentist actively practicing in Gates County. The information referred to in this article refers to licensure data effective through October 2010.

(general and pediatric) who accept Medicaid patients are the most needed.

In addition to existing shortages in rural areas and the challenges of a rapidly growing population, there are also challenges inherent in the makeup of the current dental health workforce in North Carolina. While over three-fourths (78%) of all dentists in the state are general dentists, only 4% are pediatric dentists. Additionally, the dental workforce lacks diversity, when compared with the state population. Minorities comprise 33% of the state population, while minority dentists comprise only 15.8% of the dental workforce [9]. The need for pediatric dentists and dentists who reflect the diversity of the state is significant. Furthermore, the dental workforce in North Carolina is aging, with almost one-third (31%) of the dentists 55 years of age or older. Dentists in rural areas are, on average, 3 years older than their counterparts in the urban counties [8]. The workforce shortage and maldistribution of dentists will likely worsen if these and other challenges are not addressed.

The East Carolina University School of Dental Medicine

In 2007, the North Carolina General Assembly appropriated funds for ECU to develop a School of Dental Medicine with a pre-doctoral class size of approximately 50 students per year. The dental school will also be starting an Advanced Education in General Dentistry Residency Program in the summer of 2012 and further plans to add a Pediatric Dental Residency Program in 2013. The school's primary objectives are to improve the health and quality of life of all North Carolinians by educating well-qualified primary care dentists who will also be leaders. These individuals will meet the chronic and growing oral health needs of the state and will lead the nation in community-based oral health education. The school will address current dental workforce issues in 2 complementary ways—by educating primary care dentists and providing care in rural and underserved areas across the state. Blending the education of dentists with the provision of oral health care across the state in dental school facilities is unique in dental education and is at the core of how the School of Dental Medicine intends to achieve its goals.

During the first 3 years of the curriculum, students at the School of Dental Medicine engage in traditional curricular elements in the basic and dental sciences, along with laboratory and clinical experiences. The integrated curriculum focuses on developing students' problem-solving and critical thinking skills—with an emphasis in public health—to prepare them for the fourth-year extramural exposure.

Although there are similarities to traditional schools in the first 3 years, there are subtle yet distinctive underlying differences that are fundamental to the School of Dental Medicine's unique senior year and rural primary care focus. An important prerequisite is recruiting and selecting students who value the school's mission of service in underserved areas of the state. A basic assumption is that the

individual most likely to practice in an underserved area is someone who is returning home to that area to provide care for the people they have known all their lives. Another important aspect of recruiting and selecting students is ensuring that the applicant pool reflects the diversity of the state.

At the heart of ECU's approach is a model supporting opportunities for graduates to practice in rural or underserved areas. Since large educational debt burdens can limit practice options, lower tuition (due to being a state-supported school), scholarships, and loan repayment programs are all vital if graduates are to have the freedom to practice in areas of need.

Community Service Learning Centers

Community Service Learning Centers (CSLCs) are community-based, economically sustainable dental practices of the School of Dental Medicine where students and residents provide care and advance their skills and knowledge under the supervision of dental faculty. Students, residents, and faculty live within the communities they serve. These centers are integral to the school in achieving its mission.

Selection of the CSLC sites is contingent on a number of criteria including educational requirements, the need for enhanced access to dental care, and sustainability to ensure long-term success. Ultimately there will be 10 CSLCs, all collaborating with primary care partners and serving rural and underserved regions. For example, Ahoskie, the site of the first CSLC, is being developed in collaboration with Roanoke-Chowan Community Health Center and Vidant Roanoke-Chowan Hospital and serves a 4-county region (Hertford, Northampton, Bertie, and Gates). Five CSLC sites have been selected to date, with Ahoskie opening in May 2012, followed by Elizabeth City opening in the fall of 2012. Additional sites include Sylva and Spruce Pine in the western part of the state, and Lillington, which is south of Raleigh.

The CSLCs will be similar in size and configuration and will closely resemble a large (16-chair) dental practice. In addition to dental operatories, a sterilization area, a business office, and a reception area, they will have an operatory equipped with a wheelchair lift, telecommunications capabilities, a seminar room, and a student study area. In addition, the 10 CSLCs will comprise a network of practices across the state, each monitored by a comprehensive management system that will track financial, patient, and student data. The network will be professionally monitored and managed centrally in Greenville for overall performance.

Workforce Education

The CSLCs physically extend ECU's dental school beyond the traditional campus to give students and residents the benefits of the Greenville campus with the added advantages of a unique expanded educational experience in a real dental practice environment. Further, by having students live in rural areas, the program intends to expose students to the challenges of obtaining health care, as well as to enhance

their cultural sensitivities as they learn to appreciate the rich diversity in the state. Senior students will have 3 rotations, each lasting 9 weeks at 3 different CSLCs. The CSLC faculty will be full-time School of Dental Medicine faculty who are comprehensive general dentists, and who are fully immersed in all aspects of the school's 4-year curriculum. A favorable student to faculty ratio will encourage quality mentoring. The curriculum for the senior year will emphasize current literature, patient experiences, and critical thinking in focused seminars. Delivering these focused seminars will depend heavily on the use of electronic technology and video conferencing to bridge educational environments across the state.

Access to Oral Health Care

The ECU School of Dental Medicine will have a positive impact on access to oral health care by delivering a full range of preventive and restorative care in CSLCs and by graduating dentists with the desire and expertise to practice in underserved areas. The CSLC patient population will consist of indigent, Medicaid, sliding-fee scale, and privately insured patients, with Medicaid patients being the predominant insured population. Because the educational needs of senior students include a full range of clinical dental experiences (eg, bridges, placement, and restoration of implants, etc.), the service mix must include some procedures for patients who have the ability to pay for procedures that are not covered for indigent or Medicaid-eligible patients. Leveraging technology through tele-dentistry will enhance the level of services available at the CSLCs by connecting specialists in Greenville with patients at the CSLCs.

Sustainability

Long-term sustainability is critically important to the success of the CSLCs. North Carolinians will depend on the CSLCs as dental safety net providers, thus making community/patient support vital for their success. Financial sustainability will depend on adequate revenues generated by the faculty, residents, students, and dental hygienists from an adequate mix of adult and child Medicaid, sliding-fee scale, self-pay, and privately insured patients. Faculty will provide patient care while supervising and mentoring students and residents. In addition to the continuation of adult Medicaid, key factors for sustainability include the ability to recruit and retain outstanding faculty and staff, community outreach and education, the state's support of facility costs and faculty salaries, and federal Graduate Medical Education support.

Educating the dental workforce and addressing growing oral health care needs in North Carolina are complex issues with multifaceted solutions. Leadership from all communities and sectors of interest will be required. It is clear that

the dental profession, including the dental education community, must engage with our policymakers and the public to develop long-term solutions. The ECU School of Dental Medicine offers one solution that can make a difference in ensuring more North Carolinians receive needed oral health care services. **NCMJ**

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