The Need for Dental Education in Arkansas

Submitted in Response to House and Senate Interim Committees on Public Health, Welfare and Labor

Request Dated July 6, 2007

Interim Study Proposal

(ISP 2007-173)

August 20, 2008
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The Need for Dental Education in Arkansas

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I. Executive Summary

In the 2007 Legislative session, the Arkansas General Assembly had a specific concern for the dental health status of Arkansans. The House and Senate Committees on Public Health, Welfare and Labor requested an interim study of the future of dental education in the State of Arkansas, specifically the need for a College of Dentistry at the University of Arkansas for Medical Sciences (UAMS). See Appendix A:

A study committee was established, broadly representative of the Arkansas State Dental Association, the Arkansas State Dental Board, the Arkansas Children’s Hospital Dental Service, The Arkansas Department of Health Office of Oral Health, the UAMS Area Health Education Centers (AHEC) Program, and the UAMS College of Health Related Professions, Department of Dental Hygiene. Consultation was obtained from dental educators at the University of Tennessee College of Dentistry, Texas A&M Baylor Dental College, and St. Louis University Center for Advanced Dental Education.

The findings in this report show that there is a vast unmet need for dental healthcare in Arkansas. In a sample of 7,100 third grade children in public schools throughout Arkansas in 2003, 61% had evidence of current or past cavities, 31% had untreated cavities, 21% were in need of routine care, and 6% needed urgent dental care. A small sample of high school students showed that 81% had current or past cavities, 31% were referred for routine dental care, and 12% for immediate attention. Arkansas has only one school-based dental center, the Future Smiles Clinic at Wakefield Elementary.

A specific concern deals with the lack of dental care for those without insurance. According to a 2007 Arkansas Department of Health, Oral Health in Arkansas report, oral health is an issue for persons of all ages, races, & geographic locations throughout Arkansas. The Oral Health America National Grading Project 2003 gave the following Oral Health Report Card to Arkansas:

Access to Care
Dentist Availability F
Access to Medicaid Providers D
Dental Insurance Status of elderly F
Oral Health Status D+

There has been much publicity about the very low rank of Arkansas in the Health Status Report by the Commonwealth Fund. Poor oral health is one of the major findings that lowers the overall Arkansas rank nationally to 48th.

The National Conference of State Legislatures issued a Rural Health Brief in 2008 citing the high price of ignoring oral health. The U.S. Surgeon General’s report on oral health states emphatically that oral health is integral to overall health. New research is pointing to associations between chronic oral infections and heart and lung diseases, stroke, low birth-weight, and premature births. Associations between periodontal (gum) disease and diabetes have long been noted. He further states that we see a “silent epidemic” of dental and oral diseases across the country. Many experience
needless pain and suffering, as well as financial and social costs that diminish the quality of life at work, at school, and at home. Tooth decay is the single most common chronic childhood disease—five times more common than asthma. Untreated, it usually progresses to an infection of the nerve and blood supply to the involved tooth, which may result in an abscess, cellulitis, and sometimes even death. Oral and pharyngeal cancers are diagnosed in about 30,000 Americans each year, and 8,000 people die annually from these diseases.

The strong correlation between economic development and access to a broad range of healthcare is an uncontested truth. Without adequate healthcare, economic development will not flourish in Arkansas, and oral healthcare is a significant component of comprehensive healthcare. The Arkansas dentist to population ratio is well below the national average. It is not coincidence that Arkansas has both a very low oral health status and a small dental workforce. They must be related.

Shortages of dentists in rural and inner city communities continue unabated. The lack of dentists to serve Medicaid and low-income populations is troublesome. Most dentists in Arkansas, even if they participate in Medicaid, participate at a minimum. The need for government involvement in this area persists, as the private market typically fails to distribute the health workforce to underserved and uninsured areas, improve the racial and ethnic diversity and cultural competence of the workforce, and promote adequate dental health of children.

It is very significant to note that from 2004 to 2008, there has been virtually no growth in the number of dentists in Arkansas. The average age of dentists in Arkansas is 50 years. More than half (52%) of our currently practicing dental workforce is age 50 or older, with over one-fifth (21%) of that workforce age 60 or older. National data indicate that up to 46% of male dentists age 60 and over are part-time practitioners.

Within the next ten years, we are faced with the harsh reality that fully half of the existing dental workforce in Arkansas will be retired or nearing retirement age. If the flow of new dentists into our state during the next ten years is equal to the past ten years, Arkansas will lose 25% of its dentist workforce. During the same period, Arkansas’ population is projected to exceed 3.3 million.

Dental practitioners are not equally distributed across the State of Arkansas. Four counties do not have any dentists at all, and seven counties have 40 or more dentists. Greater than 60% of the state’s dentists practice in just eight counties. These 8 counties account for 41% of the state’s population. The distribution of dental hygienists is similar. The 1,039 dental hygienists are also, not unexpectedly, most likely to be located in more urban areas.

In 2008, if Arkansas were to meet the national average of 60 dentists per 100,000 population, a 48.5% increase is needed if ALL dentists are counted. If only those who work 30 hours or more per week are counted, a 60% increase is needed.

Arkansas has never had a college of dentistry. It has relied primarily on interstate agreements to obtain dentists for our state. Without a college of dentistry, Arkansas
has made a wise choice to execute interstate agreements. However, simple analysis causes one to question whether it is a wise choice for the future.

Dental education is among the most expensive of the health professions. The lack of Arkansas in-state education places a severe impediment on students of lower income families who want to become dentists. Is a dental education for Arkansas students to be available only to children of wealthy families?

There are two dental hygiene programs in the State of Arkansas: the University of Arkansas for Medical Sciences (UAMS) and the University of Arkansas at Fort Smith (UAFS). Together, the two programs have the potential to provide the state with 50 new graduates each year as well as provide continuing education opportunities for the dental workforce. An increase in dental hygienists should parallel the increase in dentists in our state.

**Arkansas is one of only three states in the nation with a population of more than 2.5 million that does not have a college of dentistry.** All of the states that share our borders have Colleges of Dentistry, as do all the other states in our south central and southeast regions. This report establishes that there is definitely a need for a college of dentistry in Arkansas and the study committee recommends that action. The number of dentists educated through the SREB interstate agreements has failed to provide the dental workforce needed. Arkansas is among the two states in the U.S. with the lowest number of dentists per 100,000 population. Continued reliance on the SREB agreements alone will assure that Arkansas remains in that bottom tier of states.

Establishing a new college of dentistry is a long term process. Meanwhile, this report recommends that an organizational component be developed within UAMS in July 2009 responsible for developing a complete plan for a college of dentistry, and to provide leadership and necessary funding for related initiatives. The organizational component would be named the Arkansas Center for Dental Education and report directly to the Chancellor. Several initiatives of the Center are described in the report that are logical, timely, and would provide supportive infrastructure for dental education beginning long before a college of dentistry could graduate its first class.

An Arkansas Center for Dental Education is needed to serve as a forerunner of a UAMS College of Dentistry. It should be noted that UAMS has initiated several centers that went on to provide outstanding benefits for Arkansas. Among those are the Winthrop P. Rockefeller Cancer Institute, the Jones Eye Institute, and the Reynolds Institute on Aging. All began as Centers within UAMS.
Dental Study Committee Members

Charles O. Cranford, DDS, MPA, Committee Chair
Former Vice-Chancellor for UAMS Regional Programs
Former Executive Director, Arkansas AHEC Program
Professor, UAMS College of Public Health

Ann B. Bynum, EdD
Associate Vice Chancellor, UAMS Regional Programs
Director, UAMS Rural Hospital Program
Co-Director, UAMS Center for Distance Health

W. Gene Jines, DDS, FICD
Private Practitioner
Current President, Arkansas State Dental Association
Past President, Arkansas State Board of Dental Examiners

Robert L. Jolly, DDS, FICD
Private Practitioner
Member, Arkansas State Board of Dental Examiners

James D. Koonce, DDS, MSD
Director, Dental Services, Arkansas Children’s Hospital
Chief, Pediatric Dentistry, Arkansas Children’s Hospital

Susan Long, EdD., RDH
Professor and Chairman, UAMS Department of Dental Hygiene

Lynn Douglas Mouden, DDS, MPH, FICD, FACD
Director, Office of Oral Health, Arkansas Department of Health
Professor, UAMS College of Public Health
Associate Professor, University of Tennessee College of Dentistry
Associate Professor, UAMS College of Health Related Professions

Staff

Robin A. Howell
Project Manager, Arkansas AHEC Program
II. Introduction – Oral Disease: the Neglected Epidemic

No greater proof need be given to show that there is a vast unmet need for dental healthcare in Arkansas than the more than 3,000 persons (1,542 in 2007 and 1,569 in 2008), who came to stand in line, some overnight, to receive free dental care. This occurred initially in 2007, and again in May 2008, when the Arkansas State Dental Association (ASDA) with support from Delta Dental and others, sponsored a 2-day “Mission of Mercy” at the Statehouse Convention Center. What was done was not cosmetic dentistry: it was relief from pain. A total of 2,597 fillings and 5,590 extractions were performed.

“It shows there’s significant need that’s not being met,” said Dr. Joe Pinney, a dentist from Sherwood. “This is sort of a Band-Aid for the problem. I don’t know what the real solution is.”

A publication by Arkansas Children’s Hospital, entitled Natural Wonders – The State of Children’s Health in Arkansas included data from a report on dental care. Excerpts from that report follow:

In a sample of 7,100 third grade children in public schools throughout Arkansas in 2003, 61% had evidence of current or past cavities, 31% had untreated cavities, 21% were in need of routine care, and 6% needed urgent dental care. From 2004–2006, approximately 4,300 children were screened, with 57% showing evidence of current or previous cavities and 27% having untreated cavities; 22% needed routine dental care, and an additional 9% were referred for urgent dental care.

A small sample of high school students (124), of whom 91% were non-white, showed that 81% had current or past cavities, 31% were referred for routine dental care, and 12% for immediate attention. Only 15% of the children and 17% of the adolescents in Arkansas have had sealant applied to their teeth.

Arkansas has only one school-based dental center, and it is located in Wakefield Elementary School in southwest Little Rock.

The unmet needs of Northeast Arkansas led the United Way of Northeast Arkansas to request a comprehensive study of unmet community needs by the Arkansas State University-Center for Social Research. Qualitative and quantitative data were collected in two stages: from October 15, 2006-March 11, 2007 and from April 3-May 15, 2007. A specific concern deals with the lack of dental care for those without insurance in the community, an issue that specifically affects the adult population.

According to a 2007 Arkansas Department of Health, Oral Health in Arkansas report, oral health is an issue for persons of all ages, races, & geographic locations statewide:

- 60% of dentists practicing in Arkansas are located in just 8 of 75 counties;
- 23% of adult Arkansans have lost 6 or more teeth due to decay or gum disease;
- 10% of children and adolescents screened during 2004-06 were referred for urgent dental care;
- 57% of oral/pharyngeal cancers identified during 1999-2003 had spread to nearby tissues or to more distant sites before diagnosis;
- 15% of children screened in 2004-06 had sealants, as did 21% of adolescents;
- 60% of adults screened in 2004 reported receiving routine dental care, as did older adults screened in 2005;
• 26% of adults use smokeless tobacco, compared to 14% of adolescents;
• Only 62% of the state’s population is served by community water systems receiving fluoridated water.  

The Oral Health America National Grading Project 20035, funded in part by The Robert Wood Johnson Foundation, gave the following Oral Health Report Card to Arkansas:

Access to Care
Dentist Availability F
Pediatric Dentist Availability D

Access to Medicaid Providers D
Significant Medicaid Dental providers D
Dental Insurance Status of elderly F

Oral Health Status D+

A follow up report in 2005 awarded nine states an “A for Effort” grade to recognize progress, including Arkansas, with the noted progress primarily recognizing the formation of the broad-based oral health coalition, “Smiles: AR, U.S.” This award acknowledges that there is growing awareness and momentum in Arkansas among certain groups that recognize how essential oral health is to overall good health. However, much work remains to be done to address the actual needs.6

Dental caries, or tooth decay, is the most prevalent oral disease in the United States. Untreated dental caries usually progresses to an infection of the nerve and blood supply to the involved tooth, which may result in an abscess, cellulitis (infection of soft tissue), and sometimes even death.7

The consequences of not being able to access care can be catastrophic. Last year, newspapers were filled with stories of 12-year-old Deamonte Driver of Prince George’s County, Md., a Washington, D.C. suburb, who died of a brain infection caused by untreated dental disease. On and off Medicaid and occasionally homeless, he was not able to get care.

“Deamonte Driver’s inability to obtain timely oral healthcare treatment underscores the significant chronic deficiencies in our country’s dental Medicaid program,” said Kathleen Roth, DDS, during a March 27, 2007, congressional hearing held in response to the incident. She was president of the American Dental Association at the time.8

There has been much publicity about the very low rank of Arkansas in the Health Status Report by the Commonwealth Fund. Poor oral health is one of the major findings that lowers the overall Arkansas rank nationally to 48th. More specifically, the percentage of children with both a medical and dental preventive care visit in the past year was only 49%. The mean for all states was 59.2%; five states averaged 72.6%. Arkansas is not alone in having poor dental health status. Although there has been substantial improvement in oral health on a national level in the last 20-30 years, due to water fluoridation, topical fluorides, and an emphasis on prevention, oral diseases are still pandemic in the United States, as the following statistics show:
• 60% of adolescents experience gum infections;
• 84% of 17-year-old school children have had tooth decay, with an average of eight affected surfaces;
• African-American, low-income children aged 2-4 years have two to six times more untreated tooth decay than their peers;
• Over 30,000 Americans are diagnosed with oral and pharyngeal cancer each year and about 7,800 die annually;
• 29% of adolescents have severe or very severe malocclusion;
• 99% of adults aged 40-44 years have had tooth decay, with an average of 30 affected surfaces;
• 30% of those aged 65 and older have no teeth at all;
• Low-income seniors aged 65-74 years are almost four times as likely to have no natural teeth as high-income seniors;
• People without health insurance have four times the rate of unmet dental needs as those with private insurance. 
• 16% of emergency room visits are for orofacial injuries;

The National Conference of State Legislatures issued a Rural Health Brief in 2008, titled "Where Have All the Dentists Gone?" The paper discusses the problems and cites the high price of ignoring oral health. Some of those costs are:

• Tooth decay and associated pain interfered with daily activities for 4 to 5 million children and adolescents a year.
• Research has shown chronic oral infections can lead to heart and lung diseases, diabetes and stroke, as well as premature births and low birth weights, according to the U.S. Surgeon General's report, "Oral Health in America."
• The elderly lose their dental insurance when they retire, and Medicare does not pay for routine care. Hence, nearly a third of those over 65 have untreated cavities.
• About two-thirds of the states cover adult dental care to some extent through Medicaid, but in the past two years a number have cut or limited coverage in an effort to control spiraling costs. Twenty-five states are reducing or eliminating dental benefits; 27 are restricting eligibility; 17 are increasing co-pays; and 37 are freezing or reducing payments to dentists and other providers.

For additional discussion of what some states are doing to reduce the consequences of ignoring oral health needs, see full text of the Rural Health Brief in Appendix B.

Arkansas' oral health data certainly fares no better than the national data. A 2008 Adult Oral Health Survey, conducted by the Arkansas Department of Health, Office of Oral Health with the Community Health Centers (CHCs) of Arkansas, Inc., revealed the following findings from a sample of 1,650 lower income adults coming to one of the State's CHCs for medical or dental services:

• 71% stated they have had at least one permanent tooth removed because of tooth decay or gum disease;
• 20% had lost six or more teeth because of tooth decay or gum disease;
• 49% said that within the past year, they needed a dentist but did not seek care;
• 74% stated that "cost" was the primary barrier to seeking dental care, with "no dentist available" being the second highest barrier.
California has joined a public health education campaign designed to address the availability and need for accessible dental care for nearly 15 million dentally uninsured Californians. "People don’t realize the magnitude that oral health plays in their overall health and the treatment and management of other diseases. Our public education campaign begins with our children because establishing proper oral health habits now will help them for a lifetime." California’s new law, AB 1433, requiring children to receive dental checkups in their first year of public school is an important first step in highlighting the importance of oral health and making it a part of a comprehensive public healthcare program. In California, one half of all student absences each year are related to dental problems.

In the year 2000, the first-ever Surgeon General’s report on oral health was released, with the following key points:

- Oral health is integral to overall health. Simply put, one cannot be healthy without oral health. New research is pointing to associations between chronic oral infections and heart and lung diseases, stroke, low birth-weight, and premature births. Associations between periodontal disease and diabetes have long been noted. Oral health must be a critical component in the provision of healthcare, and in the design of community programs.
- Great progress has been made in understanding the common oral diseases, such as tooth decay and gum diseases. Even so, the bad news is that we still see a “silent epidemic” of dental and oral diseases across the country. Many still experience needless pain and suffering, complications that devastate overall health and well-being, as well as financial and social costs that diminish the quality of life at work, at school, and at home.
  - Tooth decay is the single most common chronic childhood disease—five times more common than asthma and seven times more common than hay fever;
  - Oral and pharyngeal cancers are diagnosed in about 30,000 Americans each year, and 8,000 people die annually from these diseases;
  - Nearly one in four Americans aged 65-74 years have severe periodontal disease;
  - Oral clefts are one of the most common birth defects in the United States, with a prevalence rate of about 1 per 1,000 births.

People with disabilities and complex health conditions are at greater risk for oral diseases that, in turn, further complicate their health. See Appendix C.

We must build an effective health infrastructure that meets the oral health needs of all Americans and integrates oral health effectively into overall health. We must remove the barriers between people and oral health services.

Private health insurance is designed to be the cornerstone of the American healthcare system. Dental insurance is only a small part of that foundation, and is missing entirely or a very weak foundation for the majority of Americans. Unfortunately, a reality is that some people view oral healthcare as optional, a low priority, and may include procedures they want to avoid. Some will not seek non-emergency oral healthcare even if it is covered by Medicaid or private health insurance. Those persons exist in all states. That challenge is a health education issue.
II. Arkansas Dental Workforce - Current and Projected

The strong correlation between economic development and access to a broad range of healthcare is an uncontested truth. A comprehensive healthcare system is a top priority for new businesses and families considering relocation. Consequently, without adequate healthcare, economic development will not flourish in Arkansas. An adequate dental workforce is an essential component of comprehensive healthcare.

This report will describe how the dental workforce in Arkansas compares to other states, but it will not define exactly how large the workforce should be. That is because no one knows. However, two things are known. One, the Arkansas workforce is well below the national average and, two, if the barriers to oral healthcare were removed, the demand would overwhelm the current workforce. Demand, rather than need, is the benchmark for a practicing dentist. Demand is not driven by need as much as it is by income and education level, by the presence or absence of dental insurance, and by the presence or absence of dental care easily accessible. Thus, removing barriers and increasing the workforce at the same time is the obvious best dual strategy. A parallel also seems obvious. It is not a coincidence for Arkansas to have both a very low oral health status and a small dental workforce. They must be related.

When there is no single, universal benchmark for the number of dental workforce needed, how does a state establish a workforce goal? Is being equal to the average of our border states the appropriate goal, or is it the average of all states? Those comparisons are found in this section. Neither of these goals is likely to be attained without a college of dentistry in Arkansas.

One reason for making the above statement is that the output of Colleges of Dentistry has decreased over the past 25 years. In the 1960’s and 1970’s there were increases in the number of dental school graduates; peak enrollment was in the 1980-81 academic year. In the 1970s, several dental schools were considered "regional schools" and there were federal grants to encourage growth of class size and the regional concept. Today, that concept (regional) is almost extinct, and federal grants have been gone for a long time. It is now more an attitude of "every state for itself." It is not unreasonable to assume that decreasing dental school enrollment combined with population growth is a train wreck waiting to happen in states that have no in-state means to educate their dentists.

The overall shortage of providers in Arkansas is further exacerbated by geographic maldistribution of existing providers and persistent socio-economic barriers. General shortages of most health professions in rural and inner city communities continue unabated. The lack of dentists to serve Medicaid and low-income populations is troublesome. The need for government involvement in this area persists, as the private market typically fails to distribute the health workforce to underserved and uninsured areas, provide adequate information and analysis on the nature of the workforce, improve the racial and ethnic diversity and cultural competence of the workforce, promote adequate dental health of children, and assess the quality of education and practice.
It is widely agreed that the greatest opportunities for influencing the various environments affecting the health workforce lie within state governments. States are the key actors in shaping these environments, as they are responsible for:

- Financing and governing health professions education;
- Licensing and regulating health professions practice and private health insurance;
- Purchasing services and paying providers under the Medicaid program; and
- Designing a variety of subsidy and regulatory programs providing incentives for health professions to choose certain specialties and practice locations. \(^{14}\)

The Arkansas State Board of Dental Examiners is the entity responsible for granting the initial license to dentists in Arkansas, and for approving annual renewals. According to their records in July 2008\(^ {15}\):

1,331 dentists were licensed in the state of Arkansas
  - 1,175 of these dentists were actually practicing in Arkansas
  - 156 of these were NOT practicing in Arkansas
  - 14% indicated that they worked less than 30 hours per week
  - An average of 3% do not renew their licenses each year

The number of NEW dentists licensed in Arkansas (over the past 10 years):

<table>
<thead>
<tr>
<th>Year</th>
<th>NEW Dentists Licensed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>23</td>
<td>332</td>
</tr>
<tr>
<td>1999</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>26</td>
<td></td>
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<tr>
<td>2001</td>
<td>28</td>
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<td>2002</td>
<td>29</td>
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<td>2003</td>
<td>35</td>
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<td>2004</td>
<td>39</td>
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<td>2005</td>
<td>36</td>
<td></td>
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<tr>
<td>2006</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>39</td>
<td></td>
</tr>
</tbody>
</table>

The table below shows the total number of dentists licensed in Arkansas in each of the last five years, and of that number, those who were practicing in Arkansas:

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Licensed in AR</th>
<th>Practicing in AR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>1,303</td>
<td>(1,129)</td>
</tr>
<tr>
<td>2005</td>
<td>1,277</td>
<td>(1,125)</td>
</tr>
<tr>
<td>2006</td>
<td>1,324</td>
<td>(1,165)</td>
</tr>
<tr>
<td>2007</td>
<td>1,294</td>
<td>(1,149)</td>
</tr>
<tr>
<td>2008</td>
<td>1,331</td>
<td>(1,175)</td>
</tr>
</tbody>
</table>

**It is very significant to note that from 2004 to 2008, the table above indicates virtually no growth in the number of dentists.**

Current data from the Arkansas State Board of Dental Examiners indicate that of the majority of dentists in Arkansas, (82%) are practicing general dentistry. The rest are specialists, including oral surgeons (4%), orthodontists (6%), pediatric dentists (3%), endodontists (2%), periodontists (2%), as well as prosthodontists (less than 1%).

A typical dentist will have a career around 40 years. National data indicate that up to 46% of male dentists age 60 and over are part-time practitioners. Over all age groups, 30% of female dentists work part-time, compared to 15% of male dentists. In Arkansas, 86.7% of the dentists are male and 13.3% are female. \(^ {16}\)

The average age of dentists now licensed in Arkansas is 49.9 years, as detailed below:
Licensed Dentists in Arkansas by Age Group\(^{17}\)

<table>
<thead>
<tr>
<th>Age</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 40:</td>
<td>350</td>
</tr>
<tr>
<td>40-49:</td>
<td>295</td>
</tr>
<tr>
<td>50-59:</td>
<td>403</td>
</tr>
<tr>
<td>60-64:</td>
<td>128</td>
</tr>
<tr>
<td>65 and up:</td>
<td>155</td>
</tr>
<tr>
<td></td>
<td>1,331</td>
</tr>
</tbody>
</table>

This data from the State Board of Dental Examiners reveals a frightening truth. More than half (52\%) of our currently practicing dental workforce is age 50 or older (N=686), with over one-fifth (21\%) of that workforce age 60 or older (N=283). Further, the data indicate in the last ten years, just over 330 new dentists were licensed in Arkansas. If these numbers remain consistent through the next decade, we are faced with the harsh reality and impending crisis that fully half of the existing dental workforce in Arkansas will be retired or nearing retirement age, and only a fraction of those retiring dentists will be replaced with new ones. If the flow of new dentists into our state during the next ten years is equal to the past ten years, Arkansas will lose 25\% of its dentist workforce. During the same period, Arkansas' population is projected to exceed 3.3 million.\(^{18}\)

Dentist Participation in Medicaid

Only about one third of the state’s dentists are enrolled with the Medicaid ARKids First programs, Parts A and B.\(^{19}\) Most dentists in Arkansas, even if they participate in Medicaid, participate at a minimum. Dental benefits for adults provided by Medicaid are almost nonexistent. The majority of dental services are available to children.

A study of ten states (not including Arkansas) by the National Center for Health Workforce Information and Analysis, US Department of Health and Human Services, \(^{20}\) reached the following conclusions and recommendations regarding dentist participation in Medicaid:

* To boost dentist participation in Medicaid, experts point to the need for states to not only raise payment rates, but to also...
  * Better understand dentist geographic distribution and practice patterns;
  * Consider having Medicaid offer sign-up bonuses or tax credits to dentists;
  * Simplify administrative tasks under Medicaid;
  * Educate Medicaid clients about the dental health system and the importance of preventive care;
  * Create or expand loan forgiveness programs for dentists willing to take public insurance;
  * Increase dental capacity of publicly supported providers such as community health centers and local health departments;
  * Consider increasing the number of school dental clinics and mobile vans;
  * Improve community-based training opportunities for dentists and use Medicaid funds for graduate medical education to support general dentistry residencies;
  * Revise practice acts to expand scope of practice for dental hygienists.\(^{20}\)
Maldistribution

Dental practitioners are not equally distributed across the State of Arkansas (see maps below). Four counties do not have any dentists at all, and seven counties have 40 or more dentists. Greater than 60% of the state’s dentists practice in just eight counties. (These 8 counties account for 41% of the state’s population.).

The distribution of dental hygienists is similar, with dental hygienists also most likely to be located in more urban areas, as hygienists work under the supervision of dentists.
The following table shows the dental workforce in each state, and the national average.

### National Rankings: Dentists per 100,000 population by State

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 District of Columbia</td>
<td>104.4 per 100,000 people</td>
<td>#29 Florida</td>
<td>51.0 per 100,000 people</td>
</tr>
<tr>
<td>#2 New Jersey</td>
<td>80.8 per 100,000 people</td>
<td>#30 Tennessee</td>
<td>50.8 per 100,000 people</td>
</tr>
<tr>
<td>#3 Massachusetts</td>
<td>80.4 per 100,000 people</td>
<td>#31 Arizona</td>
<td>50.1 per 100,000 people</td>
</tr>
<tr>
<td>#4 Hawaii</td>
<td>78.2 per 100,000 people</td>
<td>#32 North Dakota</td>
<td>50.1 per 100,000 people</td>
</tr>
<tr>
<td>#5 Connecticut</td>
<td>75.6 per 100,000 people</td>
<td>#33 Kansas</td>
<td>49.6 per 100,000 people</td>
</tr>
<tr>
<td>#6 New York</td>
<td>75.3 per 100,000 people</td>
<td>#34 Oklahoma</td>
<td>48.7 per 100,000 people</td>
</tr>
<tr>
<td>#7 Maryland</td>
<td>74.4 per 100,000 people</td>
<td>#35 Oregon</td>
<td>48.6 per 100,000 people</td>
</tr>
<tr>
<td>#8 California</td>
<td>73.9 per 100,000 people</td>
<td>#36 Maine</td>
<td>47.6 per 100,000 people</td>
</tr>
<tr>
<td>#9 Alaska</td>
<td>73.8 per 100,000 people</td>
<td>#37 Missouri</td>
<td>48.9 per 100,000 people</td>
</tr>
<tr>
<td>#10 Washington</td>
<td>67.7 per 100,000 people</td>
<td>#38 Indiana</td>
<td>46.9 per 100,000 people</td>
</tr>
<tr>
<td>#11 Colorado</td>
<td>63.9 per 100,000 people</td>
<td>#39 West Virginia</td>
<td>46.5 per 100,000 people</td>
</tr>
<tr>
<td>#12 Utah</td>
<td>63.7 per 100,000 people</td>
<td>#40 Nevada</td>
<td>46.5 per 100,000 people</td>
</tr>
<tr>
<td>#13 Nebraska</td>
<td>63.3 per 100,000 people</td>
<td>#41 Texas</td>
<td>46.2 per 100,000 people</td>
</tr>
<tr>
<td>#14 Pennsylvania</td>
<td>62.7 per 100,000 people</td>
<td>#42 South Carolina</td>
<td>45.8 per 100,000 people</td>
</tr>
<tr>
<td>#15 Illinois</td>
<td>62.4 per 100,000 people</td>
<td>#43 Louisiana</td>
<td>45.1 per 100,000 people</td>
</tr>
<tr>
<td>#16 New Hampshire</td>
<td>60.7 per 100,000 people</td>
<td>#44 North Carolina</td>
<td>44.9 per 100,000 people</td>
</tr>
<tr>
<td>#17 Minnesota</td>
<td>59.8 per 100,000 people</td>
<td>#45 Delaware</td>
<td>44.7 per 100,000 people</td>
</tr>
<tr>
<td>#18 Michigan</td>
<td>59.7 per 100,000 people</td>
<td>#46 South Dakota</td>
<td>44.5 per 100,000 people</td>
</tr>
<tr>
<td>#19 Virginia</td>
<td>58.1 per 100,000 people</td>
<td>#47 Georgia</td>
<td>44.4 per 100,000 people</td>
</tr>
<tr>
<td>#20 Idaho</td>
<td>57.7 per 100,000 people</td>
<td>#48 Alabama</td>
<td>43.2 per 100,000 people</td>
</tr>
<tr>
<td>#21 Vermont</td>
<td>55.9 per 100,000 people</td>
<td>#49 New Mexico</td>
<td>43.1 per 100,000 people</td>
</tr>
<tr>
<td>#22 Kentucky</td>
<td>55.7 per 100,000 people</td>
<td>#50 Arkansas</td>
<td>49.9 per 100,000 people</td>
</tr>
<tr>
<td>#23 Wisconsin</td>
<td>55.2 per 100,000 people</td>
<td>#51 Mississippi</td>
<td>39.7 per 100,000 people</td>
</tr>
<tr>
<td>#24 Montana</td>
<td>54.8 per 100,000 people</td>
<td>Weighted National Average:</td>
<td>60.0 per 100,000 people</td>
</tr>
</tbody>
</table>
PROJECTED NEED FOR DENTISTS IN ARKANSAS

If Arkansas is to meet the national average of 60 dentists per 100,000 population, the following calculation provides the number needed to achieve that goal:

In current year 2008:

- Arkansas' population in 2008 is 2,834,797\(^{23}\)
- Divide the population by 100,000 = 28.3
- Multiply 28.3 x 60 = 1,698 dentists needed to equal national average in 2008
- In 2008, Arkansas has 1,175 dentists in active practice; 1,063 of them work 30 hours or more per week
- The calculation shows that a \textbf{45\% increase is needed} to meet the national average, if ALL dentists are counted
- If only those working 30+ hours per week are used in the calculation, a 60\% increase is needed

In the year 2015:

- Arkansas' population in the year 2015 is projected to be 3,340,812\(^{24}\)
- Using the same calculation steps as above indicates that 2,004 dentists will be needed in the year 2015
- The calculation indicates an \textbf{increase of 70\% is needed}, compared to 2008, if ALL dentists are counted
- If only those working 30+ hours per week are used, an 88\% increase is needed

Dental Hygiene Workforce

According to the Arkansas State Board of Dental Examiners, in July 2008 there were a total of 1,308 dental hygienists licensed in Arkansas, with 1,183 actually practicing in the state. An average of 4\% of Arkansas' dental hygienists did not renew their licenses in each of the last two years.\(^{25}\)

The Number of NEW dental hygienists licensed in each of the following years follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>49</td>
</tr>
<tr>
<td>2003</td>
<td>56</td>
</tr>
<tr>
<td>2004</td>
<td>66</td>
</tr>
<tr>
<td>2005</td>
<td>75</td>
</tr>
<tr>
<td>2006</td>
<td>75</td>
</tr>
<tr>
<td>2007</td>
<td>69</td>
</tr>
</tbody>
</table>

The number of licensed dental hygienists in states that border Arkansas, and the number of dental hygienists per 100,000 population follow (2007):

<table>
<thead>
<tr>
<th>State</th>
<th># Licensed Hygienists</th>
<th>Ratio per 100,000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas</td>
<td>1,183</td>
<td>41.73</td>
</tr>
<tr>
<td>Missouri</td>
<td>3,032</td>
<td>51.58</td>
</tr>
<tr>
<td>Texas</td>
<td>10,124</td>
<td>42.35</td>
</tr>
<tr>
<td>Louisiana</td>
<td>1,940</td>
<td>45.19</td>
</tr>
<tr>
<td>Mississippi</td>
<td>1,200</td>
<td>41.11</td>
</tr>
<tr>
<td>Tennessee</td>
<td>3,768</td>
<td>61.20</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>1,966</td>
<td>54.35</td>
</tr>
<tr>
<td>Average</td>
<td>3,316</td>
<td>48.22</td>
</tr>
</tbody>
</table>
Arkansas is below the regional average in the number of dental hygienists per 100,000 population, which may be a reflection of the below average number of dentists in the state. Dental hygienists typically work under the supervision of a dentist, therefore, the geographic distribution of dental hygienists in Arkansas is similar to that of dentists.

For every active dentist, Arkansas has 0.89 dental hygienist. Compared to the region (Arkansas plus the 6 border states), this current ratio is close to the regional average ratio of dentist to dental hygienist.\(^25\)

<table>
<thead>
<tr>
<th>State</th>
<th>Licensed Hygienists</th>
<th>Licensed Dentists</th>
<th>DDS to RDH Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas</td>
<td>1,183</td>
<td>1,331</td>
<td>1 to 0.89</td>
</tr>
<tr>
<td>Missouri</td>
<td>3,032</td>
<td>3,169</td>
<td>1 to 0.96</td>
</tr>
<tr>
<td>Texas</td>
<td>10,124</td>
<td>12,603</td>
<td>1 to 0.80</td>
</tr>
<tr>
<td>Louisiana</td>
<td>1,940</td>
<td>2,479</td>
<td>1 to 0.78</td>
</tr>
<tr>
<td>Mississippi</td>
<td>1,200</td>
<td>1,450</td>
<td>1 to 0.83</td>
</tr>
<tr>
<td>Tennessee</td>
<td>3,768</td>
<td>3,103</td>
<td>1 to 1.21</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>1,966</td>
<td>2,362</td>
<td>1 to 0.83</td>
</tr>
<tr>
<td>Average</td>
<td>3,316</td>
<td>3,785</td>
<td>1 to 0.90</td>
</tr>
</tbody>
</table>

**Projected Need for Dental Hygienists in Arkansas**

Based on projected need for dentists detailed on the previous page, the following projections are made for dental hygienists:

**In current year 2008:**

Using the ratio of 0.89 dental hygienist per dentist, it is projected that 1,511 hygienists would be needed if Arkansas met the 2008 national average of 60 dentists per 100,000 population (or 1,698 dentists). This is an increase of 328 dental hygienists or 28% increase from the current number of Arkansas dental hygienists.

\[
1,698 \text{ dentists} \times 0.89 \text{ hygienist/dentist} = 1,511 \text{ dental hygienists}
\]

**In the year 2015:**

Using the ratio of 0.89 dental hygienist per dentist, it is projected that 1,783 hygienists would be needed if Arkansas met the national average of 60 dentists per 100,000 projected population (or 2,004 dentists). This is an increase of 600 dental hygienists or 50% increase from the current number of Arkansas dental hygienists.

\[
2,004 \text{ dentists} \times 0.89 \text{ hygienist/dentist} = 1,783 \text{ dental hygienists}
\]

The US Department of Labor, Bureau of Labor Statistics, projects a 30% increase in dental hygiene employment from 2006 to 2016.\(^{26}\)
IV. Current Education of Dentists and Hygienists for Arkansas

Arkansas has never had a college of dentistry and it is one of only three states in the nation with a population of more than 2.5 million that does not have one. Arkansas has relied on interstate agreements with seven states to obtain dentists for our state. The oldest and most productive is an interstate agreement with the University of Tennessee that has existed for many years, some say as far back as the 1940s. Historically, the University of Tennessee considered itself a regional college of dentistry, and has educated the majority of Arkansas dentists.

Up to the present, without a college of dentistry, Arkansas has made a wise choice to execute interstate agreements. However, simple analysis causes one to question whether it is a wise choice for the future. As the previous section in this report has shown, Arkansas ranks poorly among other states in the size of its dental workforce.

Interstate agreements are executed through the Southern Regional Education Board (SREB). Tables in this section indicate participation of states. A state could choose to withdraw from the Southern Regional interstate agreement; however, the institution would be required to teach-out all students already in the pipeline, and the contract would have to be changed to affect future classes.27

The Arkansas Department of Higher Education (ADHE) administers the Arkansas Health Education Grant (ARHEG) program. Currently, the state pays $15,000 for each of up to 30 Arkansas students enrolled in participating schools each year. The amount paid by Arkansas is approved biennially by the legislature. There is no requirement to pay back the State grant if the graduate does not practice dentistry in Arkansas.

In the 2003 legislative session, Act 1715 was enacted to authorize loans for dental students attending schools with SREB agreements. These loans are forgiven if the student returns to Arkansas to practice dentistry (i.e., one year for each year a loan is received). The 2008 loan is limited to $5,124.

The agreement with Tennessee is used as an example and summarized below. The payments are for the school year, beginning in 2008. Arkansas pays the University of Tennessee (UT) through SREB a sum of $15,000 per year per student. Arkansas also makes a loan available to students in the amount of $5,124. This money is paid directly to UT. Arkansas students then pay in-state resident tuition. UT has had a 14% increase in tuition for the coming year.

<table>
<thead>
<tr>
<th>Instate tuition:</th>
<th>$18,368 per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out of State tuition:</td>
<td>$43,468 per year</td>
</tr>
</tbody>
</table>

Following is the total amount of tuition money UT receives from Arkansas State funds and an Arkansas student in 2008-09 academic year:

<table>
<thead>
<tr>
<th>Paid to UT through SREB:</th>
<th>$15,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paid to UT through student loan</td>
<td>$ 5,124</td>
</tr>
<tr>
<td>In state student tuition</td>
<td>$18,368</td>
</tr>
<tr>
<td>Total received by UT for each Arkansas student</td>
<td>$38,492</td>
</tr>
</tbody>
</table>

This total is below the current out-of state tuition of $43,468 by $4,976.
The first year of dental loans (Act 1715) was in 2003-04. Only University of Tennessee and University of Louisville students received these loans. At the time of this report, 2008 graduate data was not yet available. A total of 22 students (5 from University of Louisville [UL] and 17 from University of Tennessee [UT]) received the dental loan; 3 of the 5 from UL graduated in 2005; 1 of the original 5 from UL graduated in 2006; all 17 UT students and the other 1 from UL all graduated in 2007. Of the total 22, there are 4 in repayment, 7 in deferment (due to entering military service or specialty training), and 11 in loan forgiveness practicing in Arkansas. The loans are typically offered to students in their freshman year; however, under special circumstances, a few have been allowed to enter the program in alternate years. With average out of state tuition costs exceeding $40,000 per year, the lack of Arkansas in-state education places a severe impediment on students of lower income families who want to become dentists. The cost of a dental education is among the highest of the health professions. Is a dental education for Arkansas students to be available only to children of wealthy families?

Arkansas Dental Students Participating in Interstate Agreements
(Total # of students enrolled in all four years of dental college)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Tennessee, Memphis, TN</td>
<td>72</td>
<td>75</td>
<td>75</td>
<td>78</td>
<td>77</td>
<td>77</td>
<td>77</td>
<td>71</td>
<td>70</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>Louisiana State University, New Orleans, LA</td>
<td>14</td>
<td>12</td>
<td>13</td>
<td>16</td>
<td>15</td>
<td>15</td>
<td>14</td>
<td>14</td>
<td>12</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>University of Louisville, Louisville, KY</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>10</td>
<td>9</td>
<td>10</td>
<td>9</td>
<td>6</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>University of Missouri, Kansas City, MO</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>University of Oklahoma, Oklahoma City, OK</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Baylor, Texas A&amp;M University, Dallas, TX</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Meharry Medical College, Nashville, TN</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>University of Alabama, Birmingham, AL</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total # of Students in all four years of dental college by Fiscal Year</td>
<td>102</td>
<td>105</td>
<td>108</td>
<td>114</td>
<td>114</td>
<td>115</td>
<td>114</td>
<td>109</td>
<td>105</td>
<td>97</td>
<td></td>
</tr>
</tbody>
</table>
Arkansas Health Education Grant (ARHEG) Program
Dental Expenditures Projected 2007-08

It is precarious for Arkansas to have 60% of the interstate agreement student slots (18 of 30) with one state; that state is Tennessee. Termination of that single agreement would place Arkansas in a desperate position.

By far, the largest number of the dentists in Arkansas received their education at the University of Tennessee College of Dentistry within the last ten years. The table below gives specific numbers for new dentist licenses in Arkansas from 1998-2007 and the school where they graduated.

New Arkansas Dentist Licenses Issued, 1998-2007, by School of Graduation

<table>
<thead>
<tr>
<th>School of Graduation</th>
<th>#</th>
<th>School of Graduation</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Tennessee</td>
<td>185</td>
<td>Medical Univ. of South Carolina</td>
<td>1</td>
</tr>
<tr>
<td>Louisiana State University</td>
<td>36</td>
<td>Michoacan Univ of San Nicolas</td>
<td>1</td>
</tr>
<tr>
<td>University of Oklahoma</td>
<td>16</td>
<td>New Jersey Dental School</td>
<td>1</td>
</tr>
<tr>
<td>Texas A&amp;M, Baylor</td>
<td>13</td>
<td>Southern Illinois University</td>
<td>1</td>
</tr>
<tr>
<td>University of Missouri KC</td>
<td>12</td>
<td>Temple University</td>
<td>1</td>
</tr>
<tr>
<td>University of Louisville</td>
<td>12</td>
<td>University of Illinois</td>
<td>1</td>
</tr>
<tr>
<td>University of Texas</td>
<td>6</td>
<td>University of Kentucky</td>
<td>1</td>
</tr>
<tr>
<td>University of Pittsburgh</td>
<td>4</td>
<td>University of Maryland</td>
<td>1</td>
</tr>
<tr>
<td>Meharry Medical College</td>
<td>3</td>
<td>University of AL@ Birmingham</td>
<td>1</td>
</tr>
<tr>
<td>Northwestern Dental School</td>
<td>3</td>
<td>University of Guadalajara</td>
<td>1</td>
</tr>
<tr>
<td>University of Detroit</td>
<td>3</td>
<td>University of Mississippi</td>
<td>1</td>
</tr>
<tr>
<td>University of Colorado</td>
<td>3</td>
<td>University of Nebraska</td>
<td>1</td>
</tr>
<tr>
<td>Case Western Reserve</td>
<td>2</td>
<td>University of North Carolina</td>
<td>1</td>
</tr>
<tr>
<td>Indiana University</td>
<td>2</td>
<td>Univ. of San Carlos of Guatemala</td>
<td>1</td>
</tr>
<tr>
<td>Loma Linda University</td>
<td>2</td>
<td>University of the Pacific</td>
<td>1</td>
</tr>
<tr>
<td>University of CA @ San Francisco</td>
<td>2</td>
<td>Universidad Michoacana</td>
<td>1</td>
</tr>
<tr>
<td>University of Florida</td>
<td>2</td>
<td>University of Nicaragua</td>
<td>1</td>
</tr>
<tr>
<td>University of Southern California</td>
<td>2</td>
<td>UTEC1 School of Dentistry</td>
<td>1</td>
</tr>
<tr>
<td>Universidad Evangelica El Salvador</td>
<td>2</td>
<td>Washington University (St Louis)</td>
<td>1</td>
</tr>
<tr>
<td>Columbia University</td>
<td>1</td>
<td>West Virginia University</td>
<td>1</td>
</tr>
<tr>
<td>Howard University</td>
<td>1</td>
<td><strong>Total</strong></td>
<td><strong>333</strong></td>
</tr>
<tr>
<td>Marquette University</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
All of the states that share our borders have colleges of dentistry, as do all the other states in our south-central and southeast regions. There are 57 colleges of dentistry in the U.S.; 13 states have more than one. The following 16 states do not have a college of dentistry.

<table>
<thead>
<tr>
<th>State</th>
<th>2007 Census</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>683,478</td>
</tr>
<tr>
<td><strong>Arkansas</strong></td>
<td><strong>2,834,797</strong></td>
</tr>
<tr>
<td>Delaware</td>
<td>864,764</td>
</tr>
<tr>
<td>Hawaii</td>
<td>1,283,388</td>
</tr>
<tr>
<td>Idaho</td>
<td>1,499,402</td>
</tr>
<tr>
<td>Kansas</td>
<td>2,775,997</td>
</tr>
<tr>
<td>Maine</td>
<td>1,317,207</td>
</tr>
<tr>
<td>Montana</td>
<td>957,861</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>1,315,828</td>
</tr>
<tr>
<td>New Mexico</td>
<td>1,969,915</td>
</tr>
<tr>
<td>North Dakota</td>
<td>639,715</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>1,057,832</td>
</tr>
<tr>
<td>South Dakota</td>
<td>796,214</td>
</tr>
<tr>
<td>Utah</td>
<td>2,645,330</td>
</tr>
<tr>
<td>Vermont</td>
<td>621,254</td>
</tr>
<tr>
<td>Wyoming</td>
<td>522,830</td>
</tr>
</tbody>
</table>

States Without A College of Dentistry
Dental Hygiene Education in Arkansas

There are two dental hygiene programs in the State of Arkansas: the University of Arkansas for Medical Sciences (UAMS) and the University of Arkansas at Fort Smith (UAFS). Together, the two programs have the potential to provide the state with 50 new graduates each year as well as provide continuing education opportunities for the dental workforce. All states have one or more dental hygiene programs; Arkansas has both an Associate of Science and a Bachelor of Science degree program.

University of Arkansas for Medical Sciences, Department of Dental Hygiene

Established in 1967, the Department of Dental Hygiene is an integral part of the UAMS College of Health Related Professions. The Department provides high quality dental hygiene education and training to prepare its graduates to assume the role of ethical, competent, and progressive professional practitioners. The Department is committed to addressing the oral healthcare needs of the community by providing affordable, high quality patient care as well as community service projects and continuing education programs for practicing dental professionals to support lifelong learning.

Enrolling a class of 34 students each fall semester, the Department has a total annual enrollment of 68 students and provides the state with over 70% of the Arkansas-educated dental hygiene graduates each year as well as the only baccalaureate (BS) dental hygiene education in the state. Graduates routinely excel in their entry-level knowledge and skills. Recent graduates have not only achieved a 100% first-time pass rate on the National Board Dental Hygiene Examination, they have met or exceeded the national average in all 13 subject areas as well as the case-study section of the examination. The Department currently has seven (7) full-time faculty, one (1) part-time faculty, and three (3) full-time staff.

The UAMS Dental Hygiene Clinic serves as a significant clinical component of the dental hygiene curriculum where, under faculty supervision, students provide a variety of dental hygiene services on a significantly reduced fee basis to a large patient population. In a state without a dental school and only one other dental hygiene program, the UAMS Dental Hygiene Clinic provides access to affordable preventive dental care to many Arkansans. In academic year 2007-2008, the clinic provided services to 3,114 people ranging from small children to senior citizens. This number does not include the oral health services provided to over 400 children enrolled in the Children International program at the University of Arkansas at Little Rock during the academic year. Students also receive a portion of their clinical education at Arkansas Children’s Hospital, North Little Rock VA, St. Vincent Health Clinic East, and Wakefield Elementary School’s Future Smiles Dental Clinic. A clinical rotation to Little Rock Air Force Base will begin in fall 2008.

The UAMS dental hygiene faculty recognizes that public health is an essential component of dental hygiene education. In an attempt to improve the health outcomes for at-risk persons as well as supplement the dental hygiene curriculum with pertinent and educational community service experiences, the Department has established a long history of partnerships with community agencies by participating in long-term projects, such as providing oral healthcare to the homeless in a project with Baptist Health and the Arkansas Army National Guard, sealants for children in dentally-underserved and non-fluoridated areas of the state (also with the Arkansas Army
National Guard), oral health screenings and education for children in Head Start programs, and clinical care for patients in the Arkansas State Hospital and residents of the Florence Crittenden Home. In 1998, the Department established a partnership with Children International at the University of Arkansas at Little Rock to provide preventive oral healthcare and education to children in need. Since that time, nearly 2,000 children have received dental cleaning, 800 sets of radiographs exposed, and over 1,500 dental sealants placed.

University of Arkansas – Fort Smith Dental Hygiene Program
Established in 1999, the mission of the Dental Hygiene Program at the University of Arkansas – Fort Smith (UAFS) is to provide the highest quality education while recognizing and respecting the dignity of each individual student. The program strives to provide a variety of quality academic, laboratory, preclinical and clinical learning experiences that prepare students to assume the role of a dental hygienist in a variety of practice settings. Students, while having the responsibility for their own learning, are provided with an environment for effective learning by the faculty. The faculty encourages students to attain their professional goals while realizing their individual potential as learners and beginning professionals.

The program enrolls a class of 16 students each fall semester for a total annual enrollment of 32 students. Graduates receive an Associate of Applied Science (AAS) Degree. Since the first graduating class, UAFS dental hygiene students have successfully passed all board examinations. The program does give two mock written board examinations and one mock clinical board examination to help ensure successful completion of these examinations. The program currently has three (3) full-time faculty, eight (8) part-time adjunct and clinical faculty, and one (1) full-time staff.

The UAFS Dental Hygiene Clinic serves as the clinical component of the dental hygiene curriculum. The clinic is comprised of 15 clinical operatories and three radiography rooms and provides preventive oral health services to the general public. Students have one rotation, which is to the Community Dental Clinic during their final semester.

The Cost of Dental Hygiene Education
The curriculum of both programs contains basic education courses: 34 semester credits (sc) at UAMS and 29 sc at UAFS. These courses are taken in addition to the dental hygiene curriculum which is 69 sc at UAMS and 56 sc at UAFS. For the BS degree, UAMS requires an additional 23 sc. Therefore, the UAMS dental hygiene program contains 126 sc for a BS degree, and the UAFS dental hygiene program contains 85 sc for an AAS degree.

Based on 2008-2009 tuition and fees, the approximate costs to complete just the dental hygiene curriculum* (69 sc at UAMS and 56 sc at UAFS) are as follows:

<table>
<thead>
<tr>
<th></th>
<th>UAMS</th>
<th>UAFS</th>
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</thead>
<tbody>
<tr>
<td>Tuition</td>
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<tr>
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</table>

23
* These costs are only for the dental hygiene programs and do not include the costs to complete the 29 sc of prerequisite coursework at UAFS or the 57 sc of prerequisite and BS degree coursework for UAMS.

Dental hygiene has been deemed a profession that is in "high-demand" by the Arkansas Technical Careers Student Loan Forgiveness Program. Since 2004, 41 UAMS dental hygiene graduates have taken advantage of the loan forgiveness program, while 32 currently enrolled students have applied to take part in the program upon graduation in 2009.

Both programs receive far more applications for admission than positions available. Admission is fairly competitive with approximately 5 applicants for every available position at UAMS. At UAMS, the most prominent barriers to admitting more applicants include limited clinic space for clinical education and funding for additional faculty in order to maintain adequate faculty to student ratios, as required for program accreditation.
V. Strategies That Increase the Dental Workforce

**College of Dentistry**

Currently, and in the past few years, several states, recognizing the need to increase production of dentists, have built new colleges of dentistry or expanded existing ones. Examples are Arizona, Florida, Iowa, Kentucky, Maryland, Michigan, Nevada, South Carolina, and Texas. The North Carolina legislature recently funded the development of a second college of dentistry. Until recently, Arizona and Nevada had no college of dentistry; Arizona now has two. Arkansas is one of only three states with a population of more than 2.5 million that does not have one or more colleges of dentistry. An academic health center is incomplete without one. Without a doubt, having a college of dentistry in Arkansas is the best assurance that our dental workforce will be increased.

**Center for Dental Education**

The University of Rochester (NY) and Saint Louis University (SLU) are two examples of academic health centers that have established centers for dental education. Saint Louis University has adopted a strategy similar to the one described in this report, and recommended for Arkansas. The major component of the SLU strategy is to develop postgraduate programs, along with other supporting initiatives, as the forerunner to establishing a college of dentistry.

The University of Rochester is farther along with their center focused on postgraduate education and dental research. Their center has acquired a national reputation for postgraduate education and research. Currently, the University of Rochester is in the feasibility study stage for developing a college of dentistry.

In both of the above examples, the universities are building a strong educational base in postgraduate education, demonstrating the ideal preparation for a new UAMS College of Dentistry in Arkansas. There will be a more detailed discussion of an Arkansas Center for Dental Education in the Recommendations section of this report.

**Postgraduate Dental Education**

There are nine (9) specialty areas in dentistry. Completion of postgraduate residency education is required for each. Three of these residencies are hospital based and could be implemented at UAMS and Arkansas Children’s Hospital during a preparation period for establishing of a UAMS College of Dentistry. They are Pediatric Dentistry, General Practice, and Oral and Maxillofacial Surgery. A successful Pediatric Dentistry Residency has existed in West Memphis at Crittenden Memorial Hospital for many years. It is an extension of the University of Tennessee College Of Dentistry and demonstrates a unique bi-state relationship.

Just as in medical residencies, the location of the residency program is by far the greatest determinant of the choice for practice location. Post-graduate dental education would certainly be a benefit to Arkansas.
Community-Based Partnerships

Community-based clinical partnerships are absolutely key to helping address any health professional maldistribution problems. Community partnerships, proven to be of great value by the University of Arkansas for Medical Sciences (UAMS) through the Area Health Education Centers (AHEC) Program, are possible for a college of dentistry. Many such examples exist in other states and could be replicated in Arkansas. Community partnerships influence the selection of practice by graduates as they provide dental services under the supervision of community-based faculty. This concept has immediate value for Arkansas dentists now seeking to recruit one or more additional dentists. Clinical education rotations could be developed with students at senior levels in colleges of dentistry. A 2008 Arkansas Health Workforce Vacancy Study, found 141 current vacancies with practicing dentists seeking to recruit. 31

Community partnerships also provide good opportunities to mentor students in pre-dental educational studies in our colleges and universities as well as to encourage high school graduates to select a career in dentistry. All of these and more are benefits that would accrue to Arkansas through college of dentistry/community partnerships. Below are some examples of strategies that are employed in other states. These examples are cited from presentations at national conferences on the design and benefits of such programs.

Children’s Hospitals

Children’s hospitals have been a vital part of dental student and postgraduate dental education when and where such institutions exist. Many children’s hospitals allow dental students to rotate through their dental clinics as part of the basic dental educational programs through dental schools. Children’s hospitals that are in the proximity of dental colleges, and have pediatric dental residencies, also allow dental students from the universities to rotate through the pediatric dental clinics. Currently, there are approximately 75 Pediatric Dentistry Residencies in the United States and its territories. Out of those 75 residencies, 30 of them are based in children’s hospitals.

Further, there are a number of General Practice Residency (GPR) and Advanced Education in General Dentistry (AEGD) programs around the United States and in the military and VA that utilized pediatric hospitals for their pediatric training. Many of the GPR and AEGD programs are also affiliated with general hospitals. Funding for many of the hospital based programs of recent vintage is unique and varied and innovative.

Community Health Centers

Community Health Centers of Arkansas (CHCA) would be an ideal partner with a college of dentistry in Arkansas. CHCA has 59 sites, only 18 of which now provide dental services on site. In order to meet their dental service goal for 2015, the number of dentists must increase from 12 to 30, and dental hygienists from 5 to 10. If Arkansas had a college of dentistry, both need and opportunity would exist for developing an educational relationship that would assist the recruitment of dentists and dental hygienists to meet the CHCA dental service
goal. Brief summaries follow that highlight beneficial partnerships between community health centers and colleges of dentistry in other states.

For over 20 years, the Colorado AHEC Program has ensured that dental students participate in rural rotations. In 1985, the school formally implemented the Advanced Clinical Training and Service (ACTS) Program. Through ACTS, all of Colorado's predoctoral dental students are required to complete clinical training rotations in community-based clinics. The entire spring semester of the senior year is devoted to four clinical affiliations, each lasting about five weeks, for each student. The program requires each senior dental student to spend a minimum of 100 days providing dental care to underserved populations.

Through the ACTS program, all 4th year dental students have required rotations at their choice of 50 remote community-based clinics, many of which are Community Health Centers.

In 2005-2006, ACTS students provided clinical care for over 27,000 patient encounters with an estimated market value of $3.4 million. Since 1995, the total estimated value of care provided by ACTS students has exceeded $30 million. Tracking graduates of the program demonstrate successful community recruitment and retention of alumni.32

The Michigan Department of Community Health subcontracted with the University of Michigan College of Dentistry to rotate dental students through five Community Health Centers (CHCs) to treat Medicaid beneficiaries. In one year, over 146 dental students, dental hygiene students, and dental residents rotated to five sites, averaging two weeks of service/learning experience at the CHCs. More than 8,600 additional Medicaid beneficiaries were treated at these five sites through this educational partnership. As a result, all five CHCs have hired dentists who were former students of this program to join their dental staff. The University of Michigan uses this partnership as a recruitment tool to attract students to dental school.33

In Mississippi, the Greater Meridian Health Clinic, a federally designated Community Health Center, is an outstanding example of an educational partnership for dental students and dental residents. The Greater Meridian Health Clinic (GMHC) operates three dental facilities and one mobile unit. Two of the sites are in rural locations while one is located in a small town. Two of the GMHC dentists have completed advanced training in general dentistry at the University of Mississippi. GMHC serves approximately 15,250 people per month; 2,304 (15%) receive dental services. The rules and regulations of the State Dental Board were followed. The CHC staff holds faculty appointments in the University of Mississippi College Of Dentistry.34

Arizona School of Dentistry & Oral Health (ASDOH) was founded in July 2003 with the fundamental aim of identifying applicants with strong community service backgrounds, integrating and emphasizing community and public health principles into the curriculum and graduating dentists with a unique understanding of and desire to serve communities in need.

A key component of the mission of ASDOH is the development of Integrated Community Service Partnerships (ICSP) that place students in community
settings to complete a portion of their clinical training during their fourth year. Basic requirements of a site include:

- Appropriate Policies and Procedures in place to ensure quality of care for the patient and safety for the student.
- Evidence of Standards of Care similar to that of ASDOH.
- Credentialing and calibration of some or all of the dentists as faculty of the school.
- Ongoing calibration and training on supervision and clinical evaluation of students.
- A plan for housing and local transportation for the students.\(^{35}\)

A small sample survey by the Community Health Centers of Arkansas, Inc. indicated that partnerships similar to the ones above also exist in Wisconsin, South Carolina, Missouri, South Dakota, and Idaho. Such partnerships could be developed in Arkansas and would benefit our state by expanding Medicaid services and by distributing more dentists to underserved areas.

**Area Health Education Centers**

In those states that have a college of dentistry, the Area Health Education Centers (AHEC) Program serves as a very important partner to facilitate a variety of community-based educational experiences for dental students.

North Carolina is a great example of how the AHEC program works with the University of North Carolina (UNC) College of Dentistry. The UNC College of Dentistry has strongly supported the mission, goals, and principles of the North Carolina AHEC Program for more than 26 years. The extramural Dentistry in Service to Communities (DISC) program for students continues to provide supervised experiences in the delivery of dental care to special, underserved and multicultural populations in settings such as county health departments, state institutions and correctional facilities, mental health centers, military bases, and the Veterans Administration and other hospitals. Exposure to these experiences may influence some individuals to pursue careers in similar settings. Residents in the General Practice Residency program and students in the dental hygiene program work with county health departments and provide care to ambulatory indigent patients and children in the Head Start and Smart Start programs. Oral and Maxillofacial surgery residents and residents in Pediatric Dentistry complete hospital rotations where an interdisciplinary approach to patient care is stressed. Residents participate in an array of hospital-based and surgical treatments, as well as consultative services.

In FY06, the UNC College of Dentistry budgeted 157.9 student months, and 188.6 were completed. Students participated in 125 North Carolina AHEC rotation experiences in 42 unique settings (25 community-based and 17 hospital-based). The North Carolina State Board of Dental Examiners approved two new sites this year--Rural Health Group, Inc. in Roanoke Rapids, and Stanly County Dental Clinic in Albemarle.

Dental hygiene students completed 32.4 student months of Undergraduate Externship Experiences. The DISC program for rising second- and third-year DDS students concluded a fifth year. These practical, real-world experiences
working with rural and underserved populations were extremely important because they occurred at a time when students were formulating career goals and practice choices. Clinical settings included migrant programs, community health centers, correctional centers, and health departments.36

**Health Departments**

Colleges of Dentistry and State Health Departments have skills and resources that create synergy and can leverage other resources working together to address dental workforce issues. There is no current database that details collaborations between State Health Departments and Dental Colleges.

However, in 2006 the Association of State and Territorial Dental Directors (ASTDD) and the American Dental Education Association (ADEA) conducted web-surveys supplemented by phone calls and emails of state dental directors and faculty or deans. The survey sought information on 1) relationships between state health departments and dental education institutions, 2) barriers to such relationships, and 3) ways ASTDD or ADEA could assist in promoting relationships. Most common barriers were administrative red tape, limited budgets, restrictive dental practice acts, and absence of a dental school.

- 47 state dental directors (90% response) and 46 college of dentistry faculty in 25 states participated.
- Dental directors reported collaborations with 39 colleges of dentistry and 23 allied dental education programs.
- 19 state dental directors held faculty appointments.
- 24 health departments provided funding to their academic partners for faculty expertise, equipment and supplies for research or dental services and student experiences.

Some examples of collaboration between Health Departments and Dental/ Dental Hygiene Schools follow:

**WI:** Health Department receives grant funds from the University of Wisconsin for the Beyond Lip Service program for equipment, supplies, and administrative costs for fluoride programs to local Health Departments and tribes. The State Dental Director also contracts with 2 technical colleges and the dental school to expand services to low-income groups.

**CO:** The State Dental Director is on the advisory committee for the Frontier Center, which is a 4-year grant from Delta Dental of Colorado Foundation to integrate dentistry and medicine at the workforce level. The State Dental Director is a faculty sponsor for freshman and sophomore dental students for research projects such as collecting hospital ER data with chief complaints of “toothache” to showcase what the state pays for ER visits with no resolution of the dental problem.

**NC:** Collaborates with the School of Public Health for research projects and program evaluation, including research base for the Health Department, Dental Public Health residency.

**NH:** Both Boston University and Tufts send dental students to dental clinics. The New Hampshire Dental Society and Bi-State Primary Care Assoc conduct recruiting programs where dentists visit the dental schools.
VT: Works with College of Dental Health to advocate for community water fluoridation and amending state rules to allow hygienists to practice in public health settings.

SC: The Craniofacial team at Medical University at South Carolina receives funding from Health Department, Rehabilitation Services.

PA: The Health Department provides funding for Continuing Education of oral healthcare professionals in cancer detection.

CT: State Dental Director is Assistant Dean of Community Affairs at the dental school and spends one day/week there, paid by the Health Department.37

Distance Education

Arkansas already has a well developed and supported Statewide Telehealth/Distance Learning Network encompassing many UAMS departments, all of the AHECs, and over 50 rural hospitals and clinics covering the entire state. This Statewide Network serves as an existing vehicle for many distance education courses provided by UAMS and AHEC faculty, extending a broad array of courses, services, and support resources to students and health professionals throughout the state who would not otherwise have access.

Teledentistry is a relatively new field that combines telecommunication technology and dental care. Teledentistry can extend care to underserved patient populations, such as those in rural areas, at a reasonable cost. Teledentistry provides an opportunity to supplement traditional teaching methods in dental education and will provide new opportunities for dental students and dentists.

In rural areas, where there is a shortage of specialists, the lack of comprehensive and specialized health care is a problem. Teledentistry can extend care to additional patient populations through specialized dental consultants and ease the problem of professional isolation in rural areas. Teledentistry in dental education can provide primary care professionals with easy access to efficient consultations and case-based CE opportunities. An experienced instructor is required for designing protocols, instructing students and providing necessary technical support. With thorough planning, teledentistry has a bright future.38
VI. Recommendations: Actions to Assure an Adequate Dental Workforce for Arkansas

It should be noted that this study has been undertaken to determine need for dental education within our state, and is not a financial feasibility study for a UAMS College of Dentistry. Neither financial nor staffing resources have been available to carry out such a study. A full feasibility study is proposed within the recommendations that follow.

Recommendation 1

The previous sections of the report established that there is definitely a need for a college of dentistry in Arkansas and the study committee recommends that action. A college of dentistry within Arkansas would provide the opportunity to implement several programs of great value to the State and provide the greatest vehicle for expanding the Arkansas dental workforce. A college could serve to attract Arkansas students, provide them with in-state tuition, and encourage graduates to stay in Arkansas. A faculty would be assembled to supervise the students as they conduct teaching clinics, which would ultimately provide dental services to many Arkansans who are not currently receiving oral healthcare.

The Arkansas SREB agreement with multiple dental schools, partially supports up to 30 Arkansas students enrolled in each of the 4 years of dental school. That strategy has failed to provide the quantity of dentists needed. Arkansas, after many years with the SREB agreements, is among the two states in the nation with the lowest number of dentists per 100,000 population. Continued reliance on the SREB agreements alone will assure that Arkansas remains in the bottom tier of states. However, until a college of dentistry is established in Arkansas, the Committee recommends that the SREB agreements should be continued.

Even without a full feasibility study, there are certain observations that can be made in this report concerning a new UAMS College of Dentistry. Using a formula based on population, which has been applied to existing colleges of dentistry, the enrollment goal for a college of dentistry in Arkansas would be 60 students per class. Dentistry is a 4-year educational program, thus a total of 240 students would be enrolled when the goal is reached. Practical reasoning would suggest that the College should begin with an enrollment of 30 in the first class and work up to the goal of 60 per class in subsequent years. Thirty students in the first class would equal the 30 first year students in the SREB agreements and those agreements could be terminated, as currently enrolled students graduate.

Recommendation 2

The second recommended action is to establish an organizational component within UAMS in July 2009 responsible for developing a complete plan for a UAMS College of Dentistry, and to provide leadership and necessary funding for related initiatives proposed in this section. The organizational component should be named the Arkansas Center for Dental Education and report directly to the UAMS Chancellor.

Establishing a new college of dentistry is a long term process. Up to four years will be needed for planning and construction. Then it will be four more years before the first graduating class. Meanwhile, the Arkansas Center for Dental Education will provide
significant benefits to our state. When a new UAMS College of Dentistry is established, the Arkansas Center for Dental Education should be merged into the College.

Concurrent with the development of a full plan for a UAMS College of Dentistry, the Center should implement, or collaborate with other organizations to implement, several initiatives that are logical and timely, supportive infrastructure for dental education beginning long before a UAMS College of Dentistry could graduate its first class. These infrastructure initiatives are recommended beginning July 2009.

Initiatives of the Arkansas Center for Dental Education:

(a) Develop a network of educational sites in Arkansas for clinical education of Arkansas students currently enrolled in Colleges of Dentistry in other states. Using strategies and models already proven in other states, initiate community-based education for dental students in community health centers, VA clinics, hospitals and private dental offices. The UAMS AHEC program could provide assistance in developing these sites, as demonstrated in many states. Clinical faculty in these sites would complete a formal faculty education program and become adjunct faculty in UAMS, and in the college of dentistry in which the student is enrolled. This initiative will become the foundation of a community-based education component when the UAMS College of Dentistry is opened. Meanwhile, it will serve to encourage Arkansas dental students to return to Arkansas when they graduate. Another benefit of the program is to prepare faculty for the new college. Faculty recruitment is a major task for any new college of dentistry.

(b) Develop post-graduate education programs in three dental specialties. Two years are required to initiate these hospital-based residencies. A Pediatric Dentistry residency should be established by Arkansas Children’s Hospital (ACH) and UAMS. A very capable dental staff exists at ACH, making the Pediatric Dentistry Residency extremely feasible within two years.

A hospital-based General Practice Residency Program should be established through a partnership comprised of UAMS Medical Center and Arkansas Children’s Hospital. See Appendix D for a description of the General Practice Residency Program.

An Oral and Maxillofacial Surgery Residency should be established by the same partnership. This residency has evolved as two models. One is a three-year program following graduation from a college of dentistry. The second model is a dual MD and DDS degree program requiring 5-8 years for completion.

Benefits of all of these post-graduate programs for Arkansas would be a source of dental specialists grown locally and likely to remain in Arkansas. These programs could be established to educate dental specialists beginning in July 2011, yielding a positive impact several years before a new college of dentistry would produce graduates. Another benefit of these post-graduate programs would be the development of faculty who could later also teach students in a college of dentistry.

(c) The Arkansas Center for Dental Education should work with Arkansas high schools, colleges and universities to enhance recruitment of pre dental students and provide mentoring throughout the dental education pipeline, including minority students. The University of North Carolina (UNC) College Of Dentistry has the
highest percentage of enrolled minority students among US Colleges. North Carolina and Arkansas have two of the largest and most comprehensive AHEC Programs nationally. The Arkansas Center for Dental Education and the UAMS AHEC Program should study the strategies employed at UNC to achieve their successful minority enrollment, seeking to replicate their success in the new UAMS College of Dentistry.

(d) In cooperation with the State Dental Association, the Arkansas Center for Dental Education should help provide continuing education for Arkansas dentists and dental hygienists.

(e) The Arkansas Center for Dental Education should establish a UAMS Foundation account to enable individuals and organizations to make charitable gifts and contributions to assist the sponsorship of its work and to support the development of a UAMS College of Dentistry.

(f) In collaboration with the Arkansas Medicaid Program, the Arkansas Center for Dental Education should conduct a study for the legislature of the feasibility and likely positive impact of implementing a dental school loan forgiveness or payback program based on the graduate’s Medicaid revenue from oral healthcare within a certain number of years of establishing dental practice in Arkansas. The goal should be to increase participation of dentists in Medicaid and to increase the number of dentists in underserved communities.

(g) During the remaining years of the SREB agreements, the Center should analyze and propose ways that the agreements could provide more benefits to Arkansas.

(h) The Arkansas Center for Dental Education should organize discussion to plan a UAMS College of Dentistry/College of Medicine/College of Public Health collaboration to initiate integrated curricular components concerning the consequences of poor oral health and to join forces in promoting early prevention and detection of oral disease.

It is possible for Arkansas to become a leader in the above united effort, now being recommended by national healthcare leaders, but not yet modeled in academic health centers. Oral diseases are among the most preventable, but are among the most pervasive throughout the population. This presents a major opportunity to improve health status in Arkansas.

(i) The Center should monitor the progress of national initiatives currently being explored by both the American Dental Association and the American Dental Hygienists’ Association concerning the creation of a mid-level oral health care provider. If a new level of provider comes to fruition nationally and Arkansas supports the designation, the Center would provide leadership in establishing the educational program that would be required.

The Arkansas Center for Dental Education is needed to serve as a forerunner of a UAMS College of Dentistry. It should be noted that UAMS has initiated several centers that went on to provide outstanding benefits for Arkansas. Among those are the Winthrop P. Rockefeller Cancer Institute, the Jones Eye Institute, and the Reynolds Institute on Aging. All began as Centers within UAMS.
The Committee recommends the following timeline to establish an Arkansas Center for Dental Education and a UAMS College of Dentistry:

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<tr>
<th>Date Range</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>2009 Legislative Session</td>
<td>Approve funding for Arkansas Center for Dental Education. Acquire space at UAMS and ACH and staff the Center.</td>
</tr>
<tr>
<td>July 2009 – Dec 2009</td>
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<tr>
<td>July 2009 – June 2011</td>
<td>Develop Pediatric Dentistry Residency and General Practice Residency at UAMS and ACH.</td>
</tr>
<tr>
<td>July 2011</td>
<td>Accept first residents in the two residency programs.</td>
</tr>
<tr>
<td>Jan 2010 – Dec 2010</td>
<td>Research college of dentistry accreditation standards; study facility designs and educational programs at selected Colleges of Dentistry; develop proposal for UAMS College of Dentistry.</td>
</tr>
<tr>
<td>2011 Legislative Session</td>
<td>Approve funding for a new UAMS College of Dentistry.</td>
</tr>
<tr>
<td>August 2013</td>
<td>Accept first class at UAMS College of Dentistry.</td>
</tr>
<tr>
<td>June 2017</td>
<td>Graduate first class from UAMS College of Dentistry.</td>
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## Budget Request for 2009-2011

### ARKANSAS CENTER FOR DENTAL EDUCATION

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*Arkansas Children's Hospital intends to provide the facilities and operational funding for the Pediatric Dentistry Residency Program and not draw on the amounts requested above.*
IX. References


17. Arkansas State Board of Dental Examiners, e-mail communication July 25 2008.


19. Arkansas Department of Human Services, Division of Medical Services (Medicaid). E-mail communication to Lynn Mouden from Sherry Koone. 8/1/08.


21. Arkansas State Board of Dental Examiners, e-mail communication March 5, 2008.


Arkansas State Board of Dental Examiners, e-mail communication July 22, 2008.


From 2/6/08 e-mail from June Morgan, ADHE, forwarded e-mail from Mary Agnes Larson, Associate Director, Student Access Programs and Services, Southern Regional Education Board.

From 2/29/08 e-mail from June Morgan, Assistant Coordinator for Student Financial Aid, Arkansas Department of Higher Education.


Dr. Susan Long, Chairman and Professor, UAMS Department of Dental Hygiene, e-mail communication August 1, 2008.


Michigan Department of Community Health, University of Michigan Dental School’s Partnership with Community Health Centers, Practice # 25002


From 2/23/08 e-mail from Lynn Douglas Mouden, DDS, MPH, Director, Office of Oral Health, Arkansas Department of Health: Professor, UAMS College of Public Health


X. Appendices
July 5, 2007

Dr. I. Dodd Wilson, Chancellor
University of Arkansas for Medical Sciences
4301 West Markham, Slot 541
Little Rock, Arkansas  72205

Dear Dr. Wilson:

The Arkansas General Assembly has a specific concern for the dental health status of Arkansans. The Legislative Council referred the attached proposal for an interim study of the need for a school of dentistry at UAMS to the House and Senate Interim Committees on Public Health, Welfare and Labor. The committees requested that UAMS be invited to be the lead agency in this study of the future of dental education in the state of Arkansas. The interim study was approved by the committees.

The committees took further action to approve a motion to request that Dr. Charles Cranford lead the dental study. The committees were sure that he would be your logical choice, but wanted to take this opportunity to affirm their confidence in him based on his leadership of the statewide UAMS AHEC Program. His professional education and experience in dentistry and his extensive national contacts were other considerations.

Thank you for your consideration of this matter.

Sincerely,

Representative Eddie Cooper, Chair
House Interim Committee on Public Health, Welfare & Labor

Senator Jack Critcher, Chair
Senate Interim Committee on Public Health, Welfare & Labor

EC:JC:KB:jw

Enclosure
Appendix A

Interim Study Request
REQUESTING THE LEGISLATIVE COUNCIL OF THE EIGHTY-SIXTH
ARKANSAS GENERAL ASSEMBLY TO REFER TO THE HOUSE AND
SENATE INTERIM COMMITTEES ON PUBLIC HEALTH, WELFARE, AND
LABOR A STUDY OF THE NEED FOR A SCHOOL OF DENTISTRY AT
THE UNIVERSITY OF ARKANSAS FOR MEDICAL SCIENCES.

WHEREAS, access to dental care continues to be a serious problem across Arkansas; and

WHEREAS, a report by the United States Surgeon General describes health care as the
"silent epidemic of oral disease affecting our most vulnerable citizens"; and

WHEREAS, dental disease leads not only to tooth loss, but may contribute to coronary
heart disease, diabetes, pre-term low birth-weight babies, and the disruption of a child's ability to
learn; and

WHEREAS, Arkansas does not have an in-state dentistry education program, but instead
pays other states to educate dentists who will practice in Arkansas,

NOW THEREFORE,
BE IT PROPOSED BY THE LEGISLATIVE COUNCIL OF THE EIGHTY-SIXTH
ARKANSAS GENERAL ASSEMBLY:

THAT the House and Senate Interim Committees on Public Health, Welfare, and Labor
study the need for a school of dentistry at the University of Arkansas for Medical Sciences.

BE IT FURTHER PROPOSED that the study proposed in this Interim Study Proposal
shall:

(1) Include a comparison of the number of dentists and other dental health care
personnel in Arkansas to comparable states, and project future needs in Arkansas;

(2) Describe access by Arkansans to programs and colleges that educate dentists
and other dental health care personnel;
(3) Recommend future actions to assure an adequate dental health care workforce for Arkansas; and

(4) Provide regular reports to the interim committees and a final report not later than September 15, 2008.

BE IT FURTHER PROPOSED that the House and Senate Interim Committees on Public Health, Welfare and Labor work in conjunction with the Area Health Education Centers Program of the University of Arkansas for Medical Sciences to study the adequacy of the dental health care workforce in Arkansas.

Respectfully submitted,

Representative Clark Hall
District 13

Representative Billy Gaskill
District 41

Filed: 04/03/07
Appendix B

Rural Health Brief
Where Have All the Dentists Gone?

by Dianna Gordon, NCSL

"There's a lot of pain. There's a lot of disfigurement. People can't even get jobs if they have bad teeth. No one is going to hire a person who has to hold a hand over their mouth when they talk because their teeth are so bad." So speaks Marcia Brand of the federal Health Resources and Services Administration, Office of Rural Health Policy.

And West Virginia Delegate Barbara Evans Fleischauer concurs. "During our evaluation of welfare reform, we asked people who had difficulties getting jobs why they had problems. Twenty-one percent said it was because of their teeth. I thought it was heartbreaking, a sad problem and one people don't seem to take very seriously."

It has been called the "silent epidemic." And as the nation struggles with threats of terrorism and war, a poor economy, and continuously rising health care costs and insurance rates -- improved oral health seems to have been left by the wayside. "People seem to think oral health--nice, shiny white teeth--is a luxury. It's not. We need to make it a national priority," Brand says.

Rotten teeth have taken a backseat to other national health and economic concerns, especially in rural areas where family dentists are few and far between. But the price is troubling:

- Tooth decay and associated pain interfere with daily activities for 4 million to 5 million children and adolescents a year.
- Research has shown chronic oral infections can lead to heart and lung diseases, diabetes and stroke, as well as premature births and low birth weights, according to the U.S. surgeon general's report, "Oral Health in America."
- The elderly lose their dental insurance when they retire, and Medicare does not pay for routine care. Hence, nearly a third of those over 65 have untreated cavities.
- About two-thirds of the states cover adult dental care to some extent through Medicaid, but in the past two years a number have cut or limited coverage in an effort to control spiraling costs. Twenty-five states are reducing or eliminating dental benefits; 27 are restricting eligibility; 17 are increasing co-pays; and 37 are freezing or reducing payments to dentists and other providers.

In rural areas, the lack is especially evident. Children, adults and elders with bad teeth face special challenges to better health -- lack of dentists, an even lower number of dentists who accept Medicaid or other discounted fees and reluctance by dentists to participate in managed care programs. The patients themselves also experience other barriers to good care since rural populations tend to be marked by poverty, limited education, cultural differences, lack of transportation and the absence of any kind of coordinated screening and referral processes.

**PROBLEM: BAD TEETH; SOLUTION: EARLY PREVENTIVE MEASURES**

Perhaps two of the easiest and most cost effective solutions to today's dental crisis are preventive: fluoridation of community water supplies and sealant programs.

Researchers discovered as early as the 1930s that people living with naturally fluoridated water had fewer cavities. Today, water fluoridation costs less than $1 per person per year. And it's estimated that every dollar spent on supplementing drinking water with fluoride averts $38 in dental care, according to the Journal of Public Health Dentistry.

More than 100 million Americans do not drink fluoridated water. In fact, San Diego, San Jose, Wichita, Portland, Ore.; and Honolulu are among the large cities that do not provide fluoridated water. (Note: California passed a law in 1995 to fluoridate water in large cities, so San Diego and San Jose have been proceeding to fluoridate). Fewer than 25 percent of the water systems in Utah, Hawaii, New Jersey, and Montana are fluoridated, with California, Wyoming, New Hampshire, Idaho and Mississippi water supplies only 25 percent to 50 percent fluoridated. Community water fluoridation has its opponents. A variety of groups, such as the Fluoride Action Network, Citizens for Safe Drinking Water and the Citizens for Health, oppose fluoridation because they claim it has never been tested for safety; it leads to a high incidence of fluorosis (discoloring of tooth enamel); and causes health problems such as bone fractures, cancer, and osteoporosis.

Dental sealants also are another low-cost, effective way to prevent cavities in children's teeth. Plastic material applied to the teeth, sealants form a hard, protective coating that guards against decay. Unfortunately, only 3 percent of low-income children under 8, and
less than 25 percent of children overall, have received dental sealants.

The Centers for Disease Control and Prevention (CDC) has offered grants for coordinated school health programs to encourage states to increase use of dental sealants. The Wisconsin Department of Health and Family Services has established the Seal A Smile initiative, which made available $60,000 in state money for sealant projects. The nonprofit groups Oral Health America and America’s Promise are dedicated to improving oral health for America’s children, and have partnered to provide a million dental sealants to approximately 225,000 children by 2010.

**PROBLEM: LACK OF DENTISTS**

One of the main reasons Medicaid patients don’t receive necessary dental care is because there are few dentists participating, according to Dr. Steven Steed, Utah dental director. And dentists don’t participate because of low reimbursement rates, difficulty in administration and patients failing to keep appointments (the national failure rate is approximately 30 to 50 percent).

Five years ago, Utah set out to change those patterns:

- Urban area dentists got a 20 percent increase in reimbursement rates if they treated more than 100 Medicaid patients a year.
- Rural dentists received a 20 percent reimbursement increase for all Medicaid patients treated.
- The state expanded the number of dental clinics it operated.

The rate hike initially resulted in some increases in the number of Medicaid dental providers and improved access to care -- especially in rural areas. Urban providers who treated more than 50 Medicaid patients increased.

In its Oral Health Improvement Act, the Utah Legislature also established an early intervention, prevention and awareness program and set up a case management program to help Medicaid clients.

Aging practitioners is another problem. In a survey of Alabama, California, Maine, Missouri and Montana, Professor Gary Hart, director of the Rural Health Resource Center, University of Washington, found a “significant” shortage of dentists in rural areas. And it will get worse. Hart discovered that rural dentists are older and plan to retire. There’s also a shortage of hygienists.

Aging dentists are not just a rural problem. Thirty-five percent of all dentists are over age 55. By 2014, the number retiring will exceed those entering the field.

**PROBLEM: GEOGRAPHIC ISOLATION**

When people say “rural” one of the sights brought to mind is charming little villages nestled among rolling hills. What is not immediately apparent are the sheer distances people must travel for the staples of life, including medical and dental care.

In response to these needs, states have literally put dental offices on wheels, moving mobile units across the rural landscape. These programs include the national Smiles Across America, sponsored by the nonprofit Oral Health America organization; Healthy Kids and Seniors, Phoenix; Miles for Smiles, Colorado, Nevada and Maine; and Mikes of Smiles, Illinois.

These mobile clinics offer school-based preventive care, including sealants. Staff also visit nursing homes and assisted living communities, as well as the homebound and disabled.

Diane Brunson, Colorado dental director, notes that such traveling units provide services to children who might otherwise never see a dentist, and they raise awareness of oral health.

The down sides are the difficulty in finding “mobile” dentists; providing emergency care; getting the community to buy in to the program; funding; and finding storage space for mobile units when not in use.

Despite sometimes unique and difficult logistics of such a nomadic lifestyle for staff -- the units need 50 amp connectors requiring communities to spend up to $2,000 for installation and disposing of all the water used at the dental facility) -- Colorado Miles for Smiles served 5,438 patients between August 1999 and June 2003. That was 605 days of patient care for people who may otherwise never have been able to see a dentist. Washington Smile Savers has six units serving 30,000 patients a year.

**OTHER THINGS STATES ARE DOING**

Brand emphasizes that though there is federal help by way of grants and research funding, “there is enormous demand. The solution lies in the states, and they have been extraordinary in addressing the issue.”

Delegate Fleischauer says that by combining State Children’s Health Insurance Program (SCHIP) and Medicaid money, “every state should be able to help kids from birth and help raise a generation that is cavity-free.”

In fact, West Virginia instituted a pediatric screening program at each of its community health centers that screens newborns to 2-year-olds for “early oral health intervention,” Fleischauer says.
"We have dentists at each community health center and we have doctors cooperating with them," she says. "And they've actually trained several hundred people to help patients improve their oral health. It's a unique pilot project and has a lot of potential."

Other state activities include:

- Kentucky proposed creating a new children's dental health fund from a tax on tobacco.
- New Mexico is considering providing funds to Baylor University to train dentists to work in the state.
- Minnesota is allowing guest licenses for out-of-state dentists and hygienists.
- Nebraska formed a Midwest consortium to fund dental student education for rural practices in Nebraska, South Dakota, Kansas and Wyoming. It has mandated water fluoridation for towns with populations greater than 1,000. The state also is offering tax incentives for dentists to treat Medicaid clients.
- Nevada created a hospital-based dental residency program to take care of those children brought to emergency rooms for teeth problems. The state also established its first dental school, which began accepting students last fall.
- Maine has established a cooperative relationship with a Canadian dental school to hold seats for dental students from Maine.
- Arizona has a new dental school that seeks to attract a diverse group of students interested in serving minority patients, those with special needs, and other underserved populations.
- North Carolina uses Medicaid funds to reimburse pediatricians and nurse practitioners to provide oral health screening, apply fluoride varnish, provide patient education, and refer patients to dentists.
- The curriculum at the University of Colorado School of Dentistry includes 6 to 18 weeks of community based clinical dentistry in a non-metropolitan area. This course serves the dual purpose of providing services to communities in need and attracting future dentists to rural areas.

WHAT STATES CAN DO

Obviously, the news about rural dental care is far from rosy. But there are other things state and local policymakers can consider, including using loan repayment programs for rural dentists and hygienists and exempting volunteer dentists from liability for work in mobile, community or rural health centers.

Policymakers also can work with rural high schools and colleges to recruit new dental students and establish scholarships. Besides adding dental services to rural and community health centers, revolving loan funds can be started for rural practices, as well as grants for equipment upgrades. And high tech can be added to the mix. "Teledentistry" via e-mail or video can save trips by patients and mobile units. All in all, providing the means for good oral health in rural areas can prove difficult, but there are solutions for states and communities to consider.

Contributions to this article were also made by Stephanie Wasserman, Shelly Gehshan, and Allison Cook.
Good Oral Hygiene May Reduce Your Cancer Risk

Study suggests that taking care of your teeth and gums may lower your chances of developing several types of malignancies.

There's an old adage that if you ignore your teeth, they'll go away. While that saying may be true, poor oral hygiene may do more than put you on the fast track to dentures. A study in the June issue of The Lancet Oncology finds that men with a history of periodontal (gum) disease may be at greater risk for several types of cancer. In studying 48,375 male health professionals, ages 40-75, researchers found that compared to those without gum disease, men with a history of it had a 14 percent greater risk of cancer, specifically lung, kidney, pancreatic and blood cancers. The increased risk persisted even in men who had never smoked.

The study adds to earlier research suggesting a link between periodontal disease and increased risk for cardiovascular disease and diabetes.

"It's just another reason to keep your mouth clean," says Rex Raper, DDS, a Cleveland Clinic periodontist. "If you can do that, you're going to eliminate some potential problems down the line."

INFLAMMATION TO BLAME?
Evidence suggests that inflammation, the body's immune response to injury or infection, plays a role in cardiovascular disease and cancer.

Starches and sugars in the food you eat combine with bacteria in your mouth to form plaque, which causes tooth decay. If you don't clean your teeth, bacteria accumulate beneath your gum line and can trigger an inflammatory response. The body generates inflammation to fight the infection, but in doing so it can cause more damage, according to Dr. Raper.

"If you let bacteria build up and not be cleaned on a regular basis, the body is going to try to fix things for you," he says. Inflammation eventually creates pockets between your gums and teeth that fill with bacteria and inflammatory substances. Eventually, the pockets grow deeper and can destroy the connective tissue and bony structures that anchor the teeth, resulting in tooth loss. At this point, the dangerous mix of bacteria and inflammatory substances can then access the bloodstream and travel throughout the body. It is this process that experts believe may link periodontal disease to systemic diseases, such as cancer.

TAKE CARE OF YOUR TEETH
The researchers noted that further studies are needed to confirm whether periodontal disease actually causes cancer and if good oral health can reduce cancer risk. Regardless, you don't need more reasons to maintain a healthy mouth.

All it takes is a toothbrush and dental floss. Dr. Raper says that even cleaning your teeth with a toothpick will help, as long as you break up the bacteria and plaque on your teeth.
Appendix C

Articles Related to

The Impact of Oral Health on Overall Health

Good Oral Hygiene May Reduce Your Cancer Risk

Tooth or Consequences: The costs of poor dental fitness

Saliva Can Help Diagnose Heart Attack
Tooth or consequences: The costs of poor dental fitness

The traditional divide between dentistry and medicine is shrinking as data accumulate linking oral health with overall health.


A few years ago, an extremely sick, 2 1/2-year-old boy came to the Houston office of pediatrician Ray Wagner, MD, with a 105-degree temperature. The illness, which required five days of hospitalization and a course of intravenous antibiotics, got its start in an infected tooth; which, in turn, resulted from poor dental hygiene and a lack of dental care. Dr. Wagner, who was then an assistant professor at the University of Texas Medical School, decided to use this case as a hook for an educational session on oral health.

"We discovered that early childhood caries [tooth decay] was the most common chronic disease of children," he said. "We were all shocked."

Now a staff physician at El Rio Community Health Center in Tucson, Ariz., he is one of more and more physicians who are looking at patients' mouths and teeth before moving on to their throats. These doctors are motivated by both firsthand experiences and the scientific literature documenting that health in this area makes a difference to the whole body.

An increasing number of physicians are educating patients on cleaning teeth and gums and advising parents on reducing the risk of transmitting cavity-causing bacteria from their own mouths to their children's. Fluoride varnishes are being applied to teeth in doctor's offices, and dentists are being added to the list of specialists consulted as needed.

"The mouth is part of the body," said Wanda Gonsalves, MD, associate professor of family medicine at the Medical University of South Carolina in Charleston. She began her career as a dental hygienist. "I'd really like dentists and physicians to co-ordinate more and not have the mouth treated as a totally separate entity."

The American Medical Association and other medical organizations have supported water fluoridation, but a movement is now emerging to have physicians more involved in mouth health. This interest had its start with the release of the surgeon general's 2000 report, "Oral Health in America." It pushed the message that oral health means more than teeth, is an integral part of wellness, and nondentists need to be involved.

"You can't be healthy if you don't have good oral health," said David Satcher, MD, PhD, who was surgeon general at the time of the report's release and is now director of the Center of Excellence on Health Disparities and the Satcher Health Leadership Institute at Morehouse School of Medicine in Atlanta.
Children's health

Physicians have since taken this report and applied it in various ways. The American Academy of Pediatrics published policy in the May 2003 Pediatrics urging pediatricians to start evaluating oral health at six months of age. Revised guidelines are expected before the end of this year. Also, a major educational session on the subject is being planned for the organization's annual meeting in October.

"We have to help physicians make [oral health] doable and make it easy, so it becomes second nature and no different than when you check the fingernails or the eyes or the ears," said Martha Ann Krol, DDS, PhD, chair of AAP's section on pediatric dentistry and head of pediatric dentistry at Duke University in Durham, N.C.

An estimated 51 million school hours are missed annually because of health problems affecting the mouth.

The U.S. Preventive Services Task Force recommended in April 2004 that primary care physicians prescribe fluoride supplements to preschoolers who primarily drink unfluoridated water. The Society of Teachers of Family Medicine launched "Smiles for Life," a curriculum designed to educate medical students and residents on oral health, in October 2005. A second edition will come out this summer. The New York Academy of Sciences hosted a symposium on this subject in January.

"Because of the historical separation of medicine and dentistry, there is a framework of thinking which separates dental care and oral health from medical care and general health. [The NYAS meeting] was one of many efforts to reconnect the mouth to the body," said Burton Edelstein, DDS, MPH, professor of clinical dentistry, health policy and management at Columbia University and a member of the event's planning committee.

These actions also were taken because, although overall dental health has improved, statistics related to children suggest the future may not be so bright. Dental caries is five times more common in children than asthma. An estimated 51 million school hours are missed annually because of health problems affecting the mouth. Data released by the Centers for Disease Control and Prevention's National Center for Health Statistics in April 2007 indicated that tooth decay in ages 2 to 5 increased for the first time in years.

"We as pediatricians haven't done a very good job of preventing disease in those youngest children," said David Krol, MD, MPH, chair of the pediatrics department at the University of Toledo's College of Medicine in Ohio and a member of the AAP's Oral Health Initiative Steering Committee. "Our previous policy in pediatrics was that we don't need to send a child to the dentist until they're age 3. By default, we were taking responsibility for those children's oral health."

Experts are particularly concerned because having bad teeth is a problem that goes far beyond the aesthetic and can become more serious as a child grows into adulthood.

"We are understanding more and more that having early childhood caries invariably sets you up to develop tooth decay of the permanent teeth," said Dr. Wagner. "Once the bacteria are well established in your mouth, they persist, and they're very hard to get rid of. Early oral disease predicts lifelong oral disease."

The mouth-body connection

And this circumstance can have implications beyond the mouth. The first signs of some
diseases such as osteoporosis or HIV infection can show up in the mouth, but poor oral health can also cause damage to the rest of the body. Over the past decade, published studies have linked tooth loss to dementia and associated it with poor pregnancy outcomes. Dental plaque can be a source of ventilator-associated pneumonia among intensive care patients. Tooth decay may increase the risk of heart disease. Diabetes can increase the risk of gum disease, and, conversely, leaving this problem untreated can make blood sugar control next to impossible.

While significant data has tied such conditions to periodontal disease, attempts to improve them by going for the teeth have had mixed results. A study in the Nov. 2, 2006, New England Journal of Medicine reported that treating periodontal disease in pregnant women had no impact on the risk of preterm birth, although related research is continuing.

**Tooth decay is 5 times more common in children than asthma.**

Other studies have been more positive. One in the March 1, 2007, issue of the same journal found that treating periodontitis could improve endothelial function. Others also documented that caring for the teeth can improve glycemic control in diabetics.

"In general the field is comfortable with the finding that treating periodontal disease in a diabetic will contribute to their glycemic control," said Robert Genco, DDS, PhD, distinguished professor of oral biology and microbiology at the State University of New York at Buffalo, who has authored numerous studies on this subject. "It probably wouldn't hurt [for physicians] to say this is a possible complication and you should see your dentist. People see their dentist anyway, but we have found that if the primary care physician makes a recommendation like that, the patients oftentimes will listen to that carefully and act on it."

Although physicians are getting more involved in oral health because of the science, the lack of access to dental care faced by so many patients -- in part because there are far fewer dentists than physicians -- also is an important factor driving their interest and involvement.

"There aren't enough dentists in this country. We really do need primary care physicians jumping on board," said Catherine Hayes, DMD, DMSc, chair of the Dept. of Public Health and Community Service in the School of Dental Medicine at Tufts University in Boston, who is investigating the impact of poor oral health on children's growth.

Patients also have more difficulty financing dental care. Far more lack dental than medical insurance. Medicare does not cover most dentistry. Medicaid dental coverage for adults is optional, although quite a few states do provide this benefit to some degree. Children on Medicaid have coverage, but because of low reimbursement rates and other issues associated with the program or with living in poverty, they can have a very difficult time finding a dentist who will see them. These realities mean disparities in oral health generally run directly along economic lines. According to data from the Agency for Healthcare Research and Quality, released in September 2007, 26.5% of those in poor families saw a dentist annually, while 57.9% of those from high-income families did.

"This is a problem that doctors have to grab hold of if we're really going to make inroads here," said Alan Douglass, MD, associate director of the family medicine residency program at Middlesex Hospital in Middletown, Conn., and co-chair of the STFM's oral health workgroup. "This can't just be relegated to dentists. There are just too many linkages to overall health, and the reality is that while most patients in the United States have access to some form of medical care, many fewer have access to dental care."

And the consequences of not being able to access care can be catastrophic. Last year,
newspapers were filled with stories of 12-year-old Deamonte Driver of Prince George's County, Md., a Washington, D.C., suburb, who died of a brain infection caused by untreated dental disease. On and off Medicaid and occasionally homeless, he was not able to get care.

"Deamonte Driver's inability to obtain timely oral health care treatment underscores the significant chronic deficiencies in our country's dental Medicaid program," said Kathleen Roth, DDS, during a March 27, 2007, congressional hearing held in response to the incident. She was president of the American Dental Assn at the time. "Fundamental changes to that program are long overdue, not simply to minimize the possibility of future tragedies, but to ensure that all low-income children have the same access to oral health care services enjoyed by the majority of Americans."

A bill was subsequently introduced in the U.S. House calling for increased funding of federally qualified health centers for dental services and training of more pediatric dentists. The proposal is currently in committee.

Additional Information:

Who gets dental care?

Percentage of people who visit a dentist at least once a year:

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<tr>
<td>College graduate</td>
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Note: For the purposes of this report, the federal poverty line was $18,850, based on a family of four.

Saliva Can Help Diagnose Heart Attack, Study Shows

April 16, 2008

AUSTIN, Texas — Early diagnosis of a heart attack may now be possible using only a few drops of saliva and a new nano-bio-chip, a multi-institutional team led by researchers at The University of Texas at Austin reported at a recent meeting of the American Association for Dental Research.

The nano-bio-chip assay could some day be used to analyze a patient's saliva on board an ambulance, at the dentist's office or at a neighborhood drugstore, helping save lives and prevent damage from cardiac disease. The device is the size of a credit card and can produce results in as little as 15 minutes.

"Many heart attack victims, especially women, experience nonspecific symptoms and secure medical help too late after permanent damage to the cardiac tissue has occurred," says John T. McDevitt, principal investigator and designer of the nano-bio-chip. "Our tests promise to dramatically improve the accuracy and speed of cardiac diagnosis."

McDevitt, a professor of chemistry and biochemistry at The University of Texas at Austin, collaborated with scientists and clinicians at the University of Kentucky, University of Louisville, and The University of Texas Health Science Center at San Antonio.

Cardiovascular disease is the leading cause of death in developed countries, including the United States. In 2008, an estimated 770,000 Americans will have a new coronary attack, and about 430,000 will have a recurrent attack.

"There is certainly a strong need for more effective early diagnosis of cardiac disease," says McDevitt.

McDevitt and his co-workers and collaborators took advantage of the recent identification of a number of blood serum proteins that are significant contributors to, and thus indicators of, cardiac disease.

Leveraging microelectronics components and microfabrication developed initially for the electronic industry, the research group developed a series of compact nano-bio-chip sensor devices that are biochemically-programmed to detect sets of these proteins in saliva. They looked at 32 proteins currently used for diagnosis of blood serum in cardiac clinical practice.

The new diagnostic test works like this: A patient spits into a tube and the saliva is then transferred to a credit card-sized lab card that holds the nano-bio-chip. The loaded card is inserted like an ATM card into an analyzer that manipulates the sample and analyses the patient's cardiac status on the spot.

The test can reveal that a patient is currently having a heart attack and that they should receive treatment quickly. It can also tell a patient that they are at high risk of having a future heart attack.

The researchers have currently measured 80 clinical patients and their data shows that the saliva tests were nearly equivalent to more standard tests on blood serum using FDA-approved instruments.

"What's novel here is our ability to measure all such proteins in one setting and to use a noninvasive saliva sample, where low protein levels make such tests difficult even with large and expensive lab instruments," McDevitt says.

The new technology is still in the clinical testing phase, but it is a strong candidate for further commercial development through the Austin, Texas company LabNow, Inc., a start-up venture that licensed the lab-on-a-chip technologies from The University of Texas at Austin. LabNow's first lab-on-a-chip product, now in development, targets HIV immune function testing and can be used in resource poor settings like Africa.

Lead investigators from The University of Texas at Austin are Drs. John McDevitt, Nicolaos Christodoulides and Pierre N. Floriano. The University of Texas Health Science Center at San Antonio lead investigators include Drs. Chih-Ko Yeh and
Spencer Redding, Lead investigators at the University of Kentucky are Drs. Craig Miller, Michael J. Novak and Jeff Ebersole. University of Louisville lead investigator is Dr. Denis Kinane.

This research is supported by the National Institute of Dental and Craniofacial Research at the National Institutes of Health.

For more information, contact: Lee Clippard, College of Natural Sciences, 512-232-0675; Dr. John McDevitt, 512-471-0046; Ann Blackford, 859-323-6363 ext. 230

Office of Public Affairs
P.O. Box Z
Austin, TX 78713

512-471-3151
Fax 512-471-5812
Appendix D

General Practice Residency (GPR) Description

A General Practice Residency (GPR) is a two-year, hospital-based, postgraduate training program for dentists seeking additional education to improve their dental/surgical skills prior to entering a traditional or hospital-based practice. In the GPR, residents are exposed to a wide range of medically compromised patients needing dental care while in a hospital setting. The resident becomes proficient at managing comprehensive dental treatment plans and adjusting them based on the patient's medical condition. The program emphasizes how oral health affects overall medical well being.

During training, residents are faced with managing patients that require dentistry in a hospital due to a compromised medical condition. Such medical management of dental patients is emphasized in grand rounds and rotations that include anesthesia, internal medicine, children's hospital, cancer center, family medicine, otolaryngology, and the emergency department. These rotations not only increase the dental resident's knowledge, but also allow physicians to see how both dentistry and medicine are related and help to form better referral relationships in future practices. This relationship may also be demonstrated in tumor boards where both physicians and dentists discuss and plan treatment of head and neck cancer patients. Residents will take call, answer consults and manage head and neck trauma in accordance with hospital guidelines.

The resident will become familiar with performing dental/oral surgical procedures in the operating room and managing the patient's stay while in the hospital. General Practice residents work closely with maxillofacial surgeons, allowing the resident to improve skills in oral surgical procedures, biopsy technique, pathology recognition, and treatment planning/consultation and referral.

All university teaching hospitals should have dentists on staff. The GPR is a proven way of developing that important resource for patient care at UAMS.