

AMERICAN DENTAL HYGIENISTS' ASSOCIATION (ADHA)

Dental Hygiene at the Crossroads of Change

Environmental Scan 2011-2021

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Contents

- Executive Summary..... 1
- Collaborative Leadership for Dental Hygiene 3
- Future Opportunities for Dental Hygienists..... 5
- Expanding Access & Ensuring Equity in Oral Health Care..... 9
- Harmonization of Practice 13
- Growth of For-Profit Schools and Corporate Education 17
- Technology Advances in Oral Health 21
- Aging Workforce 25
- Conclusion..... 28

DENTAL HYGIENE AT THE CROSSROADS OF CHANGE

Executive Summary

The dental hygiene profession is coming to a crossroads of change that may require difficult personal and collective decisions to either seize new roles and leadership opportunities or stay with a familiar yet possibly declining direction.

The American Dental Hygienists' Association (ADHA) commissioned this environmental scan to help you as an ADHA member explore the future of oral health and the changes dental hygienists must make to contribute to the health and well-being of society. This report intentionally focuses on issues that could challenge your assumptions about the profession and require you and your colleagues to join with ADHA to explore new and often challenging opportunities. The ADHA board will also use this scan to make strategic decisions about the association's priorities, programs and services.

Many dental hygienists will work as they always have. Increased demand for oral health care might even increase the number of dental hygienists working inside dental offices. Some of you will choose to stay on this path and help the profession evolve from this vantage point to better serve patients. Others of you will be drawn to become pioneers moving the profession to new places and possibilities. You will discover in this environmental scan major changes within the broader health care system as well as where innovations and technological advances in oral health might take you.

In either journey you choose, collaborative leadership can guide you to future success. Collaborative leaders engage people and groups to work toward common goals that rise above their traditional roles, disciplines and past experience and beliefs.

To facilitate this environmental scan, ADHA chose futurists Marsha Rhea and Craig Bettles to help ADHA leaders identify an expansive list of potentially important trends and issues for the profession. The ADHA board and council chairs then reviewed this list and prioritized six change drivers for additional study. The findings, perspective and strategic advice in this environmental scan express the authors' assessment. In the report, the authors briefly explain each change driver, pose strategic challenges and opportunities and ask strategic questions you can use to learn more about this crossroads. Each section has a summary of the author's findings and references for more study. The table that follows provides a quick overview of the six change drivers.

<u>Change Driver</u>	<u>Summary</u>	<u>ADHA Impact</u>
Future Opportunities for Dental Hygienists	New opportunities for dental hygienists will emerge in community centers, health care organizations and retail locations, but they must work hard to secure these opportunities.	ADHA will need to take a leadership role in guiding practitioners to new, growing fields of practice and ensuring they have the skills to succeed.
Expanding Access & Ensuring Equity in Oral Health Care	Expanding access to oral health care will be a defining issue for DHs looking to improve the health of the nation and create new opportunities for practice.	ADHA can be the leader in promoting the expansion of quality oral health care, and in doing so, ensure future opportunities for their members.
Harmonization of Practice	Public and private payers will look to harmonize standards and scope of practice to improve quality of and access to oral health care.	ADHA will need to fight to standardize and expand dental hygiene scope of practice.
Growth of For-Profit Schools and Corporate Education	For-profit and corporate education programs will continue to grow creating fierce competition for jobs in some markets.	ADHA will need to work with for-profit schools to improve standards, gain control over accreditation and grow ADHA membership.
Technology Advances in Oral Health	New advances in science and technology will radically alter oral health care.	ADHA must be ready to support members as they work to develop and learn how to use new technology to improve oral health care.
Aging Workforce	The largest and most influential generation will be retiring over the next decade and swelling the ranks of older patients with high demands for complex oral health care.	Baby boomers will leave the workforce with a wealth of experience challenging ADHA to develop the next generation of leaders.

Collaborative Leadership for Dental Hygiene

The essential nature of leadership is changing as the world becomes more interconnected and interdependent. Hierarchical models of leadership don't work in an environment where fast, agile and interconnected organizations and networks are commonplace.

What is working is collaborative leadership. Collaborative leaders engage people and groups to work toward common goals that rise above their traditional roles, disciplines, past experience and beliefs. In a study of the future of leadership, the Harvard Business Review concluded that "organizations filled with aligned, empowered and collaborative employees focused on serving customers will outperform hierarchical organizations every time."

Collaborative leadership is a more challenging form of leadership because it draws its power from passion, empathy, innovation and accountability rather than position, knowledge and experience. Collaborative leaders inspire people with a clear vision and meaningful purpose. They work to build trust and share their power and influence throughout their organizations. Collaborative leaders develop and empower other leaders through mentoring and coaching; and they continuously learn how they can improve their own leadership capabilities.

Dental hygienists who can lead in new, collaborative organizations will be in high demand in the future. The challenges we face these days in health care and most aspects of society are simply too complex to be solved by individuals or even single organizations. Interdisciplinary teams, connected through technology, are redefining traditional roles and scopes of practice. Established areas of expertise matter less than demonstrated competencies and the ability to coordinate people and resources to better serve patients and consumers.

As you read each of the change drivers, think about the possibilities for collaborative leadership as a game-changing strategy. Consider how this might require you to change your own beliefs about your future and what you can do to get better prepared to be the pioneers leading dental hygiene into a preferred future. To win acceptance of dental hygienists in new practice settings, will you be the one to build relationships with businesses, public health leaders and other health care providers? What will they expect you to be willing to learn to step into new roles serving patients and customers?

Think about who your potential partners and allies might be because in collaborative leadership, you will not travel alone to a meaningful solution. Foundations with a serious stake in health equity and access see health care extenders like advanced practice dental hygienists as a solution. As payers, business groups, Centers for Medicare and Medicaid and state agencies search for affordable and effective health care, they too are looking beyond traditional roles to who can meet these needs.

The ability to collaborate with other professions and organizations is a significant challenge not only to the individual dental hygienist, but also to ADHA. The leaders of the dental hygiene profession must be as bold, as collaborative, as their members when working with the representatives of these other organizations. Dental hygienists do not have the power to harmonize practice and take it to the next level without these essential allies. Only by working collaboratively in local communities and through coordinated initiatives can the profession create and achieve the future it desires.

Collaborative leadership will require new knowledge and competencies—the so-called soft skills that are so hard to learn. This is a large and formidable challenge for the profession as a whole and will require collaborative change across the spectrum of professional education. Private, for-profit schools have structured their programs to serve adult learners seeking an expedient route to the job skills for new careers. Corporate education programs are more likely to specialize in programs tied to their products and services. This leaves a great opportunity for ADHA and other institutions to develop the knowledge and skills dental hygienists need to both deliver care and deliver on their promise as leaders.

Strategic Questions

1. What past beliefs will you and the profession need to abandon to embrace collaborative leadership?
2. What can you do to help create a culture of collaborative leadership across the profession?
3. What relationships can you help cultivate to help the profession move into new areas of practice and responsibility?

For additional background, read:

Herminia Ibarra and Morten T. Hansen. (July/August 2011) Are You a Collaborative Leader? *Harvard Business Review*. July-August, 2011, pp. 69-74.

Scott A. Snook. (April 26, 2010) Imagining the Future of Leadership. *Harvard Business Review Blog Network*. Available at: <http://blogs.hbr.org/imagining-the-future-of-leadership/>

Center for Creative Leadership. (July 2010) *Addressing the Leadership Gap in Healthcare*. Available at: <http://www.ccl.org/leadership/pdf/research/addressingLeadershipGapHealthcare.pdf>

Turning Point. (2005) *What Is Collaborative Leadership in Public Health?* A website of resources available at: <http://www.collaborativeleadership.org/>

Future Opportunities for Dental Hygienists

People need convenient, affordable oral health care in the places they work, live and shop. Meeting these unmet needs will enable dental hygienists to expand their access and influence in oral health.

Innovative strategies are needed to ensure that everyone has access to oral health care. Roughly 1 in 6 Americans, or 49 million people, live in an area without adequate dental care. By 2020, as more dentists retire, there will only be one dentist per 1,800 people.

There will be plenty of demand, and opportunities, for dental hygienists to expand their reach into retail clinics, community health centers, pediatric centers, senior and assisted living communities and other areas. However, the scope of practice of the dental hygienist will need to expand in most states to achieve these opportunities.

Growing demand for oral health care from the basic to the most complex will create a favorable environment for legislative change regarding scope of practice. Dentists will have growing opportunities in advanced practice areas such as cosmetic and regenerative dentistry which should make them less protective of the services dental hygienists can provide. There is also a growing demand for affordable oral health care services, especially in underserved communities, which creates natural allies among community health, social justice and other groups. Also, advances in telemedicine will make it easier to supervise dental hygienists that may be providing care in an off-site clinic or community center.

Dental hygienists will need both basic business skills and advanced soft skills for developing a base of clients in new markets and practice areas. They will be creating this client base among consumers who demand transparency, value and values from business. Increasingly, customers are flocking to businesses that have clear and transparent values and work within the community to promote those values.

New opportunities for dental hygienists will emerge in community centers, health care organizations and retail locations, but they must work hard to secure these opportunities.

Opportunities & Challenges for DHs

- Diverse types of work and greater control over career path.
- Greater demand for business & entrepreneurial skills.
- Higher risks for independent DHs.

Opportunities & Challenges for ADHA

- Potential growth in membership & membership diversity.
- Need to change reimbursement & scope of practice.
- Institutional resistance to change among members & dentists.

Strategic Questions

1. Are dental hygienists prepared to work as independent entrepreneurs?
2. Are dental hygiene schools providing adequate training in business skills?
3. How can ADHA prepare its members to seize opportunities as they arise?

Additional Information

The Focus on Values & Value: The ongoing recession has highlighted changes in the buying habits of the public especially among the Millennial generation (those born between 1982 and 2001). Easy wealth driven by continuous rises in asset prices is a thing of the past. In response, consumers have refocused their spending to prioritize sustainability, community, connection, quality and creativity. Consumers are spending their hard earned, and often-times rare, discretionary income on high-quality goods and services that provide good value, reflect their own values, and support their community.

The internet and social media have stripped businesses and brands of most of their obfuscation. Technology savvy consumers are able to find out almost anything they want about a product or service and reward those companies that are open and transparent. In the health care space, this has translated into much more available information about quality measures, outcomes and consumer satisfaction. The most successful businesses are the ones that can build open, transparent and meaningful relationships with their customers.

The new consumer is also much more likely to take a do-it-yourself (DIY) attitude and seek out products that can help them do for themselves. Advances in technology, particularly nanotechnology, will drive innovation in new consumer-oriented products for teeth cleaning, teeth whitening, fluoridation of teeth and other services that would normally be provided by the dental hygienist (see also Technology Advances in Oral Health). Successful dental hygienists will need to go beyond the provision of these services, and form a partnership with their clients across a spectrum of preventive care related to oral health. However, this will require advanced soft skills in addition to clinical knowledge about prevention.

For additional background, read:

John Gerzema and Michael D'Antonio. (Spring 2011) The Power of the Post-Recession Consumer. *strategy+business*, 62. Available at: <http://www.strategy-business.com/article/00054?gko=340d6>

Convenient Care Clinics: In 2004, only 57% of privately insured consumers saw a dentist. Some of the barriers to receiving needed oral health care include high costs, lack of providers and inconvenient locations or times. Similar problems exist in primary medical care and helped spark the development of convenient care clinics using Nurse Practitioners (NPs) and Physician Assistants (PAs) to provide convenient, low-cost preventive care. Retail clinic sales have increased 81% per year since 2005 according to health care market research firm Kolarama Information.

Similarly, there is growing demand for low-cost, quality preventive oral health care. In a survey conducted by the California HealthCare Foundation, roughly 44% of the consumers surveyed—including 63% of those among them who identified themselves as Latino—indicated that they would use a retail clinic that provided these services. To be successful the retail clinic needs to provide streamlined services with moderate, transparent prices and extended hours.

Retail clinics could complement a dental home and would need connections to dental practices to refer complicated cases. A few states already have the scope of practice that would allow dental hygienists to provide these services, but many more would need significant changes to make the retail clinic model viable. Also, changes in reimbursement policies, in particular for Medicaid, are needed to make retail clinics an option for many underserved patients. As of June 2010, only 15 states allow their state Medicaid departments to directly reimburse dental hygienists.

For additional background, read:

May Kay Scott. (November, 2009) *Retail Dental Clinics: A Model for the Underserved?* California HealthCare Foundation. Available at: <http://www.chcf.org/publications/2009/11/retail-dental-clinics-a-viable-model-for-the-underserved>

Alex Berenson. (October 11, 2010) Boom Times for Dentists, but Not for Teeth. *New York Times*. Available at: <http://www.nytimes.com/2007/10/11/business/11decay.html>

Cosmetic Dentistry: Cosmetic dentistry is rapidly growing due to an increased focus on personal attractiveness, new technology for cosmetic dentistry and an aging Baby Boomer population. There is a growing number of dentists that focus primarily or solely on cosmetic procedures such as teeth whitening, veneers, braces and implants. Implants, in particular, are likely to be a fast growing segment of the cosmetic dentistry market due to technology advances and an aging population. The dental implant market alone is estimated to be a \$3.2 billion global industry.

Market research firm Frost & Sullivan forecasts cosmetic dentistry to grow to a \$12.9 billion business by 2016 as the core market (women aged 41-60) continues to grow. This growing market, estimated at \$495,000 in revenue per practice, should provide opportunities for both dentists and dental hygienists. Some areas of cosmetic dentistry, particularly implant work, are highly complex. The growth of complex care will force dentists to move up the value chain. As they do so, it provides an opportunity for dental hygienists to take over the more routine and preventive care formerly done by dentists.

For additional background, read:

Michael DiFrisco. (December 12, 2007) Cosmetic Dentistry Continues to Surge - Market Estimated at \$2.75 Billion. *American Academy of Cosmetic Dentistry*. Press release available at:

<http://www.aacd.com/index.php?module=cms&page=723>

Brahadeesh Chandrasekaran. (January 10, 2011) *The Rise of Cosmetic Dentistry*. Frost & Sullivan. Summary available at: <http://www.frost.com/prod/servlet/market-insight-top.pag?docid=221252128>

Expanding Access & Ensuring Equity in Oral Health Care

Many populations in the US don't have access to good dental care and this need could create new opportunities for dental hygienists working on the frontline of oral health. More than half the U.S. population does not visit a dentist each year. Poor, minority and rural communities are much more likely to have poorer oral health and unmet dental needs.

In 2014, health care access will extend to 94% of Americans due to laws enacted under the Patient Protection and Affordable Care Act (PPACA). The PPACA shifts the focus of health care to early stage prevention through reimbursement and delivery changes such as global payments for care, evidence-based medicine and medical homes.

As the medical system focuses more on prevention, there will be a push to improve oral health knowledge and training among family doctors, nurses, physician assistants and other health care workers. However, existing and anticipated shortages of primary care providers limit the amount of oral health care these workers can provide directly.

The next likely step is to expand access to basic, low-cost preventive oral health care through the health care exchanges, Medicare and Medicaid. Dedicated dental health providers will likely be embedded in new health care centers, community centers and schools especially in underserved communities. However, in order to seize these opportunities, the profession must improve its own diversity and educate existing dental hygienists in culturally competent care.

Dental hygienists are well placed to seize these opportunities as providers of quality oral health care. Advanced practice dental hygienists could work in collaboration with medical and community health professionals as part of a care team focused on prevention & wellness. In many states, without the expansion of dental hygienists' scope of practice, they would still need to operate under the supervision of a dentist using advanced telemedicine technology (see also Harmonization of Practice & Technology Advances in Oral Health for more information).

Expanding access to oral health care will be a defining issue for DHs looking to improve the health of the nation and create new opportunities for practice.

Opportunities & Challenges for DHs

- Increased demand for oral health care.
- Greater outreach in underserved communities.
- Need for better training in cultural competency.

Opportunities & Challenges for ADHA

- Growing opportunity to expand access and influence.
- Need to increase direct payment for services & scope of practice.
- Large disconnect between diversity of the profession & the population.

Strategic Questions

1. Is the profession prepared to work in community and health care settings?
2. How can the profession increase its diversity and improve the cultural competency of existing members?
3. Who are the potential partners in health care, government, business and the non-profit sector that can help ADHA expand access to good oral health care?

Additional Information

Whole Health: Access to oral health care is a significant problem across the United States. In 2004, more than half the population did not see a dentist for regular preventive care. While in 2007, roughly 5.5% of the population reported being unable to get or delaying needed dental care. Those numbers are much higher than similar rates for patients needing medical care or prescription drugs. The numbers are even worse among poor, minority and rural communities. For example African-American and Latino children are less likely to have seen a dentist or had dental contact in the past year than white children. By the same token, rural communities are much less likely to receive good oral health care. Fewer rural residents have dental coverage and there are fewer dentists in rural areas. Just 6% of dental hygienists live in rural areas. The water in rural communities is less likely to be fluoridated making dental caries more common.

Poor oral health is linked with multiple health problems including adverse pregnancy outcomes, respiratory disease, cardiovascular disease and diabetes. Oral diseases that start in the mouth can travel through the body, especially in patients whose systems are stressed by chronic disease. For example, periodontal bacteria have been found in brain abscesses, pulmonary tissue and cardiovascular tissue. Left untreated oral health diseases can lead to severe health problems and even death in rare cases.

Good oral health screening can also be a window into the general health of patients allowing trained providers to spot nutritional deficiencies, immune disorders, and some types of cancer. Non-treatment of dental caries may be associated with inappropriate use of emergency room care. Emergency rooms are ill-equipped to deal with oral health issues often leading to a prescription for pain or antibiotics and a referral to a qualified provider. The end result is higher costs and duplication of care without any increase in the quality of care. High, and inappropriate, use of the emergency room as a primary care center is one of the major drivers of health care costs.

For additional background, read:

Institute of Medicine (IOM) and National Research Council (NRC). (2011). *Improving Access to Oral Health Care for Vulnerable and Underserved Populations*. Washington, DC: The National Academies Press. Available at: <http://www.iom.edu/Reports/2011/Improving-Access-to-Oral-Health-Care-for-Vulnerable-and-Underserved-Populations.aspx>

Life Impact of Oral Health: Good oral health is a key component of quality of life through its effects on speech, nutrition, growth and social development. Dental problems are correlated to sleep loss, concentration problems, and can cause chewing to be painful. Poor oral health affects the intake of dietary fiber and some nutrient-rich foods (causing lower levels of beta carotene, folate and vitamin C among other nutrients). In the US, dental visits or problems related to oral health accounted for 117,000 hours of school lost per 100,000 children. Because most dental offices are open only during school and work hours, taking a child to the dentist can have a large impact on low-income families.

School Based Health Centers (SBHCs) are one growing area for reaching children by providing basic health care, including oral health care, in elementary and secondary schools. The PPACA includes new funding streams designed to expand and strengthen SBHCs. Government agencies such as HRSA are pushing for comprehensive oral health services in SBHCs. SBHCs are located right in the school where access to at-risk kids is high and offer a convenient location for busy parents especially the working poor. Studies have shown that children with access to a SBHC are twice as likely to have needed sealants; they also have improved academic performance, greater use of primary care and are less likely to use emergency rooms.

For both adults and adolescents, an appealing physical appearance is a requirement for a better quality of life. Some studies have shown a link between oral health and socioeconomic status that goes beyond access to care. However, the link between oral health and social status, while intuitive is mostly unexplored in the academic literature due to the difficulties in doing rigorous analysis on the subject. Despite this, the anecdotal evidence is widespread. For example, cosmetic dentistry and teeth straightening technology have both experienced rapid growth over the last decade even in the face of one of the worst recessions in modern history. As the use of cosmetic dentistry continues there will be a further gap in quality of life, and even professional prospects, among communities without access to good oral health care (see also Future Opportunities for Dental Hygienists).

For additional background, read:

Aubrey Sheiham. (September, 2005) Oral Health, General Health and Quality of Life. *Bulletin of the World Health Organization*, 84 (9): 641-720. Available at: <http://www.who.int/bulletin/en/>

A.N. Donaldson, B. Everitt, T. Newton, J. Steele, M. Sherriff and E. Bower. (January, 2008) The Effects of Social Class and Dental Attendance on Oral Health. *Journal of Dental Research*, (87) 1: 60-64. Available at: <http://jdr.sagepub.com/content/87/1/60>

Workforce Diversity: The concerns about providing culturally appropriate oral health care will grow as American society becomes much more diverse. Children of immigrant families, 87 percent of which are U.S. citizens, are the fastest growing segment of the nation’s youth population. A diverse workforce (including race and ethnicity, gender, and geographic distribution) leads to better access to care, greater patient satisfaction, and better communication. For example, the research on health equity among Latinos shows that linguistically and culturally appropriate oral health care is an important component of reducing disparities.

Right now there is a huge need to educate the oral health care workforce in the cultural competency skills they will need to succeed in diverse communities. Dental hygienists are predominantly non-Hispanic white (over 90%) and female (99%). In addition, better programs for outreach, mentoring and education support are needed in underserved communities. As the demographics of the oral health workforce drifts further from the population they serve, dental and dental hygiene programs will be challenged to include more courses and clinical experience with diverse communities.

For additional background, read:

Center for Health Workforce Studies. (2007). *Survey of Dental Hygienists in the United States*. American Dental Hygienists’ Association (ADHA) Chicago, IL.

Harmonization of Practice

Currently, the scope of practice for dental hygienists varies widely by state. Public and private payers will look at harmonizing practice across states to improve quality of and access to oral health care.

Consolidation in the health care industry and the growing influence of the federal government are creating the conditions for increased harmonization of practice across the health care industry. Also, more health policy makers favor expanding the scope of practice for low and mid-level health care providers as a way to increase access and lower prices.

Improving access to oral health care is a national concern and requires national attention. Correspondingly, in the near future, the federal government is likely to use reimbursement policies to harmonize practice across the states with an eye toward expanding access to care.

Dentist organizations oppose harmonization of practice fearing, low-quality and potentially low cost competition for services. However, this resistance could shift as more dentists pursue new, high-value practice opportunities. Also, as evidence based practice becomes the standard in health care, all health provider organizations will have a harder time blocking changes in scope of practice that are proven to be safe and effective.

These forces of change will also challenge the dental hygiene profession to clarify and update what makes this a distinct profession while championing new advancement opportunities for dental hygienists. For example, the widespread adoption of dental therapists to improve oral health care in rural communities as envisioned by the W.K. Kellogg Foundation could accelerate this examination of the profession's identity and future evolution.

Public and private payers will look to harmonize standards and scope of practice to improve quality of and access to oral health care.

Opportunities & Challenges for DHs

- Direct access to patients for certain types of care.
- Greater freedom of movement and more career choices.
- Ongoing need to improve clinical skills.

Opportunities & Challenges for ADHA

- Potential to move into new areas of practice.
- Membership growth especially for advanced practitioners.
- Potential emergence of competitor organizations.

Strategic Questions

1. How can the profession use the harmonization of practice to expand professional opportunities of dental hygienists?
2. Are dental hygienists open to accepting and collaborating with dental therapists and other emerging providers of oral health care?
3. Will ADHA be prepared to take a leadership/controlling role in the licensure of new practitioners in advanced or expanded scopes of practice?

Additional Information

Scope of Practice: The profession of dental hygiene is expanding beyond traditional roles and core competencies. One indicator of this shift is the growing number of dental hygienists with special permits and permissions to provide care beyond what was originally delineated under their state’s laws. In 2007, almost half of all dental hygienists (47.3%) reported having a certification or permit to practice under special circumstances such as unsupervised practice. Roughly one quarter of the dental hygienists in the same survey held two or more current state licenses.

The high number of dental hygienists with special permits and permissions points to a growing demand for advanced dental hygiene practitioners (ADHP). Dentists, particularly younger dentists, are relying on dental hygienists to perform more complex care. Dental hygienists are also interested in expanding their knowledge and career choices. Most importantly, the ADHP would help address the huge unmet needs for oral health care in underserved communities (see also Expanding Access & Ensuring Equity in Oral Health Care). However, in many states, legacy regulations and institutional resistance prevent the public from directly accessing dental hygienists for preventive care.

For additional background, read:

Center for Health Workforce Studies. (2007) *Survey of Dental Hygienists in the United States*. American Dental Hygienists’ Association. Available at: <http://adha.org>

Dental Therapists: The push for dental therapists to serve underserved communities is one area where public policy is pushing out the scope of practice in the face of institutional resistance from dental providers. Under the original model, based on dental therapist programs in Australia, New Zealand and the UK, dental therapists can provide care directly to patients with limited or no supervision by a dentist. Dental therapists receive two years of training in preventive services and common dental procedures such as fillings and uncomplicated extractions.

Public health advocates, particularly the W.K. Kellogg Foundation, have promoted the dental therapist model as a way to address oral health care shortages, particularly in isolated rural communities. Currently, Alaska operates a dental therapist program that provides care in isolated Alaska Native Communities. The W.K. Kellogg Foundation is currently investing more than \$16 million in similar dental therapy programs in Kansas, New Mexico, Ohio, Vermont and Washington.

There is significant institutional resistance to dental therapy, particularly to the idea of giving dental therapists access to patients without dental supervision. This resistance could ease with advances in information and communication technology that allow dentists to supervise dental therapists remotely (see also Technology Advances in Oral Health). Recent legislation passed in Minnesota allows dental therapists to administer a number of services without an on-site dentist, but all restorative services, extractions, and complex care require the presence of a dentist.

Dental therapists in Minnesota will be graduates of an approved bachelor's or master's education program. The legislation also included an advanced dental therapist provision for a master level educated provider with expanded scope of practice without on-site supervision (similar to the ADHP model championed by ADHA). On August 5th, 2011, the Minnesota model for dental therapists took a significant step forward, with the Commission on Dental Accreditation (CODA) agreeing to establish accreditation standards for dental therapy education programs.

For additional background, read:

Alex Berenson. (April 28, 2008) Dental Clinics, Meeting a Need With No Dentist. *The New York Times*. Available at: <http://www.nytimes.com/2008/04/28/business/28teeth.html>

W.K. Kellogg Foundation. (November 17, 2010) Dental Therapy Website. Available at: <http://www.wkkf.org/what-we-support/healthy-kids/dental-therapy.aspx>

American Dental Hygienists' Association. (2010) The History of Introducing a New Provider in Minnesota Available at: www.adha.org/downloads/MN_Mid-Level_History_and_Timeline.pdf

The Slow Process of National Harmonization: Consolidation in the health care industry and fiscal pressures are pushing states toward national standards and harmonization of practice. The PPACA continues this trend with greater federal involvement in health care including the development of national standards for clinical care (see also Expanding Access & Ensuring Equity in Oral Health Care).

The same trends pushing toward harmonization of practice in the broader health care industry can be seen in oral health care, although the process is not nearly as advanced. States are moving toward regional standards through the increased use of regional testing services, as a way to improve quality and to cut costs. Similar to the broader trends in health care, a review of legislation related to dental hygiene shows that states are expanding scope of practice to make oral health care more accessible.

States may eventually move toward one national clinical examination. A single clinical examination would help validate an expanded scope of dental hygiene practice, limit confusion among states and enable dental hygienists to move freely to areas of high demand for oral health care. It would also enable greater national control over skill development of the profession and reduce costs for states.

Harmonization of practice is also something that the younger generation desires. Millennials generally have a global outlook and will push for greater freedom of movement throughout their careers. In fact, the next step may be the development of international standards for clinical practice and more liberal reciprocity agreements that would allow freer movement of dental hygienists across the globe.

For additional background, read:

American Dental Hygienists' Association. (August 2011) *Stateline Website*. Available at: http://www.adha.org/governmental_affairs/stateline.htm

Ameerah T. Givens. (September-October, 2009) Dental Hygiene: One Profession, One License, One National Clinical Examination. *Strive-The Student View*. Available at: <http://www.adha.org/publications/strive/0910-2009-strive.htm>

Vanessa A. Fernandes. (September-October, 2009) An International Dental Hygienist in America. *Strive-The Student View*. Available at: <http://www.adha.org/publications/strive/0910-2009-strive.htm>

Growth of For-Profit Schools and Corporate Education

At a time when governments are too strapped to meet the increasing demand for workforce education, for-profit schools and corporate education programs have stepped in with innovative solutions to educate adults for new job opportunities.

For-profit schools have targeted dental hygiene programs as one of many growth opportunities. However, these new for-profit schools often target students in urban areas that already have established dental hygiene programs. This can lead to local surpluses of dental hygienists, depressed wages, and reduced career opportunities for both new and existing dental hygienists. Many new dental hygienists are also saddled with higher levels of student debt from higher tuition.

Staffing is a growing challenge for all dental hygiene programs as the Baby Boomer generation enters retirement age. Almost half of the full-time dental hygiene faculty is approaching retirement age. For-profit schools are able to challenge more established schools for faculty by being more entrepreneurial and less constrained in how they staff and structure education programs. Also, with the advent of online learning technologies to administer and deliver professional development, many corporations have elected to offer free and low-cost education programs to win clients and build customer loyalty. They are bypassing associations and universities to reach prospective students by layering knowledge and professional development opportunities over their marketing efforts.

At the same time, state and federal governments are slashing budgets for universities and community colleges. They will face continued pressure to cut funding over the next two decades due to massive shortfalls in pension programs, social security and health care. Established education providers will not be able to rest on their record of creating and maintaining the highest standards for dental hygiene education. To attract future students, they will need to innovate and deliver education on the topics adult learners are seeking. In the end, by providing competition to established education providers, for-profit schools and corporate education programs may help to expand the teaching of soft skills, business skills, clinical skills and technical skills that dental hygienists will need to succeed in the future.

Private schools and corporate education programs will continue to grow creating fierce competition for jobs in some markets.

Opportunities & Challenges for DHs

- Growing career opportunities in dental hygiene education.
- Financing education and paying down student debt.
- Avoiding over-saturated markets for dental hygienists.

Opportunities & Challenges for ADHA

- Shortages of qualified dental hygiene educators.
- Growing student debt among membership.
- Ensuring high educational standards across private & public institutions.

Strategic Questions

1. Are for-profit dental hygiene programs doing a good job of preparing graduates for the future?
2. How can the profession encourage more dental hygienists to become educators?
3. Who are the leaders among for-profit and corporate education dental hygiene programs and can ADHA partner successfully with them to advance the profession?

Additional Information

Enrollment across the Dental Professions: Enrollment has been growing across the dental professions, particularly among care extenders like dental hygienists. The enrollment in dental programs across the United States has increased 17.6% over the last decade. Enrollment in dental hygiene programs has grown 20% in the last decade. Despite this heady growth, there remains significant unused capacity in dental hygiene programs. Over 80% of degrees awarded to dental hygienists are associate degrees, with bachelor degrees making up the majority of the remainder.

Racial and ethnic diversity is increasing among students of the dental professions. For example, roughly 41% and 20% of first-year students enrolled in dental and dental hygiene programs respectively were non-white. Dental hygiene programs continue to struggle with gender diversity, with men making up only 3.3% of first-year students. However, as an interesting side-note, non-whites make up the majority of male first-year students.

For additional background, read:

American Dental Association (February, 2011) *2009-10 Survey of Dental Education: Academic Programs, Enrollment and Graduates*. Available at: <http://www.ada.org/1621.aspx>

American Dental Association (February, 2011) *2009-10 Survey of Allied Dental Education*. Available at: <http://www.ada.org/1621.aspx>

For-Profit Schools: The recent growth of dental hygiene programs has been driven by private, for-profit programs. Roughly 60% of the institutions offering new dental hygiene programs between 2007 and 2011 were private programs. The vast majority of the private programs were for-profit programs. However, despite this strong growth in private programs, it should be noted that 88.7% of the institutions offering dental hygiene education are public institutions. While the high growth of private programs points to a larger future shift in dental hygiene education, it might take decades for the true impact to be felt across the profession.

However, based on a review by the authors on new programs listed in the most recent American Dental Association (ADA) survey of allied dental education, many dental hygiene programs open in urban areas that already contain one or more dental hygiene programs. This can easily lead to oversupply and underemployment in those markets while the broader need for oral health care remains unfulfilled. About one-third of dental hygienists (34.1%) who reported difficulty in finding work in 2007 cited overproduction of dental hygienists in their area as a contributing factor to their inability to find work.

For additional background, read:

American Dental Hygienists' Association. (June, 2011) *Dental Hygiene Education Facts*. Available at: http://www.adha.org/careerinfo/dir_education.htm

American Dental Association (February, 2011) *2009-10 Survey of Allied Dental Education*. Available at: <http://www.ada.org/1621.aspx>

Quality of Education: The growth in enrollments at dental education programs is causing widespread shortages in skilled educators. Surveys of dental hygiene educators reveal almost half of full-time faculty members are approaching retirement age. Some of the other factors leading to shortages of educators across the health professions include low levels of interest in academic careers and disparities in salaries between careers in education and private practice. There are challenges that are unique to dental hygiene including a smaller base of practitioners with a baccalaureate degree, a low number of master degree programs in dental hygiene, lack of diversity among faculty, inadequate mentoring of new faculty and lack of institutional support for dental hygiene faculty.

One significant challenge is ensuring that the growing number of for-profit dental hygiene programs are offering the courses needed for dental hygienists to transfer to 4-year programs should they decide to pursue a career in education. The baccalaureate degree is the entry-level degree for dental hygienists interested in careers in education and many more dental hygienists will need to complete a baccalaureate degree to address current and future shortages (see also Harmonization of Practice).

For additional background, read:

Elizabeth Carr, Rachel Ennis, Laura Baus. (Fall, 2010) The Dental Hygiene Faculty Shortage: Causes, Solutions and Recruitment Tactics. *Journal of Dental Hygiene*, 84 (4): 165-169. Available at: http://findarticles.com/p/articles/mi_hb6368/is_4_84/ai_n57230729

Higher Education Cuts: Almost every state in the nation has experienced ballooning budget deficits as a result of the recent recession and jobless recovery and is making deep cuts in funding for higher education. For example, the state of Florida's cuts led to tuition hikes of 15% for 2011-2012, bringing the cumulative tuition increase since 2009 to 52%. In almost all cases, the tuition hikes at state institutions are in addition to widespread furloughs and staff cuts. The pain is likely to continue in the foreseeable future as 25 states are making major cuts in higher education for 2012, according to analysis by the Center on Budget and Policy Priorities. At least 16 of those states have proposed layoffs or identifiable cuts in pay and/or benefits for public workers.

For additional background, read:

Erica Williams, Michael Leachman and Nicholas Johnson. (July 28th, 2011) State Budget Cuts in the New Fiscal Year Are Unnecessarily Harmful. *Center on Budget and Policy Priorities*. Available at: <http://www.cbpp.org/cms/index.cfm?fa=view&id=3550>

Technology Advances in Oral Health

Successful oral health care providers will take advantage of new technologies to provide better quality and more convenient care. Less adaptive professions will see a decrease in demand for their services as new technology takes over lower-value services.

Private companies and government agencies have been investing heavily in nanotechnology and biotechnology research. The fruits of that research are already hitting the market in the form of better imaging technologies, innovative materials, new consumer products and pharmaceuticals. Over the next two decades, this will pay out further dividends, with the development of bio-engineered tissue and gels that promote soft-tissue growth.

The next generation of dental hygienists will need to have a higher level of knowledge and the technical skills to effectively use new technologies. As more dentists provide high-value services such as regenerative dentistry, they will be looking to dental hygienists to take over many of their former duties, allowing skilled dental hygienists to expand their scope of practice and provide more advanced levels of care. Also, better information and communication technologies will expand the reach of teledentistry allowing advanced practice dental hygienists working in remote locations to regularly check in and confer with dentists on more complex cases.

New technology will likely take over some of the lower-value services in oral health care. Patients will have a wide array of improved consumer products for preventive home care. Also, advances in robotics and automation may automate some of the routine tasks of dental hygienists. One possibility is the combination of advanced robotics, imaging technology and treatment advances such as dental lasers. These automated systems could provide basic cleaning and treatment of pre-cavities. The economic advantage of the machines is likely to be small due to high costs. However, continued shortages of oral health providers might make them a disruptive innovation in underserved communities.

New advances in science and technology will radically alter oral health care

Opportunities & Challenges for DHs

- Better preventive treatments for patients.
- More opportunities to provide high-value services.
- Greater need to keep current on new technologies for care.

Opportunities & Challenges for ADHA

- Potential to expand scope of practice.
- Strong need to keep leadership & membership aware of technology advances.
- Potential for advances to erode lower-value services.

Strategic Questions

1. What resources are available for practicing dental hygienists who need to learn about new technologies for care?
2. How well is ADHA evaluating new advances in technology and communicating those changes to the membership?
3. Is the profession prepared to take a leadership role in developing new technologies for oral health care?

Additional Information

Imaging & Treatment Advances: Imaging technologies such as spiral CT scanning and intra-oral digital cameras are allowing dental hygienists to create richer models of a patient's mouth and teeth. Greater detail and the use of 3D models are improving the ability of dentists to identify structural problems and develop precise solutions. Continued advances in imaging technology will enable dentists and dental hygienists to spot cavities very early, thereby allowing early treatment and prevention of cavities. For example, laser systems could be effective in finding tiny early cavities that traditional machines may miss. Early identification and treatment of cavities is quicker, cheaper and less painful for the patient.

The most interesting future development may be the combination of imaging technologies with alternatives to the dental drill. Dental lasers allow dentists to remove shallow areas of decay without much pain or discomfort (alleviating the need for a local anesthesia). Also, air abrasion technology, which was first invented in the 1940s, is experiencing a renaissance as companies experiment with new applications and additives to the blown air. Air abrasion excels at delicate work, and patients like the reduction in noise, vibration and pain.

However, few dental offices have adopted these two technologies due to the high initial cost of the machines. That might change as imaging technologies advance and merge with new automated systems for care. Automated robotic systems are increasingly used in medical care and are displacing many traditional surgeries with less invasive alternatives. Similar to medicine, the high precision and low amount of pain associated with the dental laser and air abrasion technologies make them good candidates for future automated machines for identifying and treating early cavities.

However, the high cost of these future machines may limit their use in oral health care without new innovation in the delivery of care. It is possible that technology improvements could pave the way for a disruptive innovation in the marketplace. A couple of examples of disruptive innovations in similar markets include the development of Invisalign in the orthodontic market and laser eye surgery in ophthalmology.

For additional background, read:

Amber Dance. (June 10th, 2010) In the Works: Dental Lasers. *Los Angeles Times*. Available at: <http://articles.latimes.com/2010/jun/07/health/la-he-in-the-works-20100607>

Nanotechnology Advances: Businesses and government agencies such as the National Institute of Dental and Craniofacial Research (NIDCR) have been investing heavily in nanotechnology research. Nanotechnology works on the molecular level, atom by atom, to create new materials with unique molecular structures. Nanotechnology is already being used to improve a wide array of consumer products for oral health. For example, mouthwashes are available that use nano-silver particles to combat bacteria and many newer brands of toothpaste include nano-sized crystals of hydroxyapatite (a key component of tooth enamel). On a more cautious note, little is currently known about the long-term impacts of nanotechnology products on health and the environment. Some preliminary studies indicate there may be significant risk of nano-particles passing through the skin into the bloodstream and accumulating in tissue and organs.

Advances in nanotechnology will likely lead to a new generation of tooth-colored fillings that are stronger, adhere to the tooth longer and look more like natural teeth. Some of the current advantages of nanotechnology materials include improved biocompatibility, strength, wear-resistance, toughness and aesthetics. Nanotechnology researchers are also having success in developing new adhesives with greater strength and unique properties.

Nanotechnology is also enabling new advances in regenerative dentistry by creating materials containing nano-particles of growth hormone or other medicines. These new gels, films, scaffolds and fillings are able to encourage natural tissue growth. In one case, a team of French scientists recently used a nanotech gel containing a growth hormone to regenerate dying tooth pulp in mice. These types of gels could dramatically improve the effectiveness of root canal therapy if researchers are able to replicate the results in humans.

For additional background, read:

J. Clarence Davies (April 28, 2009) *Oversight of Next Generation Nanotechnology*. Project on Emerging Nanotechnologies. Available at: <http://www.nanotechproject.org/publications/archive/pen18/>

Science Daily (July 3, 2009) Nanotechnology May Increase Longevity of Dental Fillings. Available at: <http://www.sciencedaily.com/releases/2009/07/090701145529.htm>

Eric Bland (September 7, 2010) No more fillings? Gel regenerates teeth. *MSNBC*. Available at: http://www.msnbc.msn.com/id/37978810/ns/health-oral_health/#.Tk6aoV185Ao

Regenerative Dentistry: One of the most exciting areas of current medical research is the development of living, functional tissues to repair or replace damaged organs. Researchers are currently exploring a few different avenues including the cultivation of stem cells, kick-starting regeneration inside the body and the growing of organs and tissue in vitro (tissue engineering). One of the most promising areas of current research is regenerative medicine in oral health (also called regenerative dentistry).

One of the more advanced areas of tissue engineering is the growing of teeth by using stem cells layered over scaffolds infused with growth factors. These grown teeth are much more natural than traditional implants. Researchers are also developing bio-compatible scaffolds that can be placed directly in the mouth so a new tooth can be grown directly in the tooth socket. Other researchers are exploring ways to encourage growth using cells that are found in the adult mouth. For example, researchers at the University of Alberta are exploring ways to use low doses of ultrasound to stimulate tooth growth from a patient's own gums.

Regenerative dentistry research has been delayed due to the tricky technical and moral problems associated with stem cells. This has encouraged scientists to explore sources of postnatal stem cells that can be used for specific applications. An interesting area of research is primary teeth, or more specifically, the stem cells found within primary teeth. They are abundant, easy to extract and are an ideal source of cells for tooth structures and bone. Also, the stem cells are genetically linked to the patient. Stem cells from primary teeth may also be useful for regeneration of soft tissue and even for the treatment of neural and degenerative diseases.

For additional background, read:

P.D. Telles, M.A. Machado, V.T. Sakai and J.E. Nör. (May-June, 2011) Pulp Tissue from Primary Teeth: New Source of Stem Cells. *Journal of Applied Oral Science*. Available at: http://www.scielo.br/scielo.php?pid=S1678-77572011000300002&script=sci_arttext

Science Daily. (May 25, 2010). Tissue Engineering Technique Yields Potential Biological Substitute for Dental Implants. Available at: <http://www.sciencedaily.com/releases/2010/05/100524111724.htm>

The Economist. (February 26, 2004) Tooth Fairies: It May Soon Be Possible for Adults to Grow New Teeth. Available at: <http://www.economist.com/node/2459140>

Aging Workforce

It's no secret that the American population is aging rapidly. The Census Bureau projects that the elderly population, those aged 65 and older, will grow by over 36% between 2000 and 2020.

The Baby Boomers, the first of which are turning 65 in 2011, are expected to dramatically change the institution of retirement. They are not only the largest group to enter retirement; they are also the most educated, wealthiest and most diverse generation to enter retirement (although there are large income gaps among the elderly). Unlike previous generations, it is widely expected that this diverse generation will remain active in the workforce and their communities after retirement.

Professions and organizations that are able to engage and retain older workers will have a strong advantage over the next decade. With its emphasis on mentoring and coaching, collaborative leadership is one answer to how an aging workforce can prepare the generations to succeed.

The graying of the population will also mean greater demand for more complex oral health care and dental procedures. Many elderly patients will experience some tooth loss and may wear permanently cemented bridges, partial dentures, or even complete dentures. This increases the importance and complexity of good oral health care. In addition, these patients will be at higher risk of oral cancer, oral ulceration and bone loss.

Dental hygienists, who are skilled in geriatric care and are willing to work in organizations like nursing homes, will be in high demand in the future. According to Census Bureau projections, the population of the 'oldest old', those aged 85 and older, is expected to grow by 377% by the year 2050. Over the next decade there will likely be new, innovative strategies to bring good oral care into the homes and long term care facilities where the 'oldest old' reside.

The largest and most influential generation will be retiring over the next decade creating new demands for oral health care.

Opportunities & Challenges for DHs

- Increased demand for geriatric focused oral health care.
- Increased demand for volunteer & mentorship programs.
- Increased strain on social safety programs.
- Loss of experienced mentors inside the workplace.

Opportunities & Challenges for ADHA

- New forms of volunteerism & community engagement.
- New opportunities in geriatric care.
- Loss of experienced leadership within the profession.

Strategic Questions

1. What entry-level and continuing education options are available for DHs specializing in geriatric care?
2. What are the current programs inside ADHA that are specifically designed for the retired or semi-retired DH?
3. How prepared is the profession to hand leadership to the next generation of DHs?

Additional Information

Oral Health Care & the Elderly: Better prevention and oral health care over the last fifty years have increased the number of elderly retaining their natural teeth. This is especially true among higher income and better educated populations. A greater number of older Americans with natural teeth will increase the demand for good oral health care particularly in relation to the two most prevalent oral diseases (i.e. dental caries and periodontal disease). In 2002, approximately 50% of persons over the age of 75 years had root caries affecting at least one tooth and 25% suffered from the loss of tooth-supporting structures because of advanced periodontal disease.

Dental hygienists working with geriatric patients will need additional skills and experience to serve their more complex health needs. Older populations, particularly the ‘oldest old’ are in worse general health, have limited dexterity and a reduced tolerance for stress which can lead to serious conditions. For example, a survey of nursing home residents with hospital-acquired pneumonia showed that dental plaque was the source of infection for 10 of 14 residents.

For additional background, read:

Centers for Disease Control & Prevention. (December 19, 2003) *Public Health and Aging: Retention of Natural Teeth Among Older Adults*. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5250a3.htm>

The Graying of America. The U.S. Census Bureau projects that the elderly population, those aged 65 and older, will grow by an estimated 120% by 2050. The majority of those will be interested in leaving the workforce or altering their work lives. Leading organizations across the country are using new methods to keep older Americans engaged in the workforce including flex-scheduling, phased retirement, tailored benefit packages, mentorship programs, support services for older workers and wellness programs.

Studies by AARP indicate that 8 in 10 Baby Boomers expect to work at least part-time during their retirement due to both better health and a lack of retirement savings. However, the conventional wisdom of the Baby Boomers working longer may depend on the recovery of the U.S. economy. With currently high unemployment rates there is a growing pool of younger, cheaper workers.

For additional background, read:

Philip Longman. (October 13, 2010) Think Again: Global Aging. *New America Foundation*. Available at: http://www.newamerica.net/publications/articles/2010/think_again_global_aging_38390

Karla Hignite. (September, 2002) Aging Gracefully. *Association Management*. Available at: <http://www.asaecenter.org/Resources/AMMagArticleDetail.cfm?ItemNumber=5136>

The ‘New Older’ American. Higher resources and educational attainment throughout their lifetimes will likely mean that retiring Baby Boomers will be in better overall health. As a result they will likely work or volunteer in their communities longer and will demand better geriatric care in their retirement. In 2011, the first of the Baby Boomers (those born between 1946 and 1964) will turn 65 and begin to leave the workforce.

The Baby Boomers, particularly those born earlier, were the most educated generation in American history. According to Census Bureau data, 43% of men and 40% of women ages 55 to 64 have attained some type of a college degree. Correspondingly, the Baby Boomers are also one of the wealthiest generations to enter retirement. However, Baby Boomers also have a smaller pool of potential family caregivers than current older adults due to smaller family sizes and higher divorce rates which should increase the demand for geriatric care workers.

For additional background, read:

William H. Frey. (June 12, 2007) *Mapping the Growth of Older America: Seniors and Boomers in the Early 21st Century*. Brookings Institute. Available at: http://www.brookings.edu/papers/2007/0612demographics_frey.aspx

Ira B. Lamster. (May, 2004) Oral Health Care Services for Older Adults: A Looming Crisis. *American Journal of Public Health*, 94 (5): 699-702.
Available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1448319/?tool=pubmed>

Conclusion

Just as the ADHA board will be examining the trends and issues described in this environmental scan to make decisions for the association, you can decide what these changes mean for your own career. Many of the trends discussed in this report can already be seen in your daily work. Others may take years to play out. All of them will create career opportunities if you are prepared to seize them.

This is the very time you need to learn and adapt to a changing environment. Even if you are well established in your own career, you may want to lend your voice and expertise to champion the pioneers who will be moving into emerging practice areas. You may decide you want to acquire the knowledge and skills for advanced practice opportunities. And just as surely as new technologies find their way into our personal lives, you can be confident you will be challenged to understand and adopt new technologies in your clinical practice.

Whether you are a new entrant to dental hygiene, an accomplished practitioner or an elder in the profession, you have a role to play in shaping the identity and future of the profession. The defining issue for the profession will be your leadership role in providing access to quality oral health care to everyone. Making sure every community has access to high quality oral health care requires dental hygienists to go outside their comfort zone and lead change from the frontlines.

Collaborative leadership is a powerful strategy for creating and achieving a shared vision for the future of dental hygiene. It requires that you draw courage and wisdom from your colleagues in ADHA and from the friends and allies you cultivate in other organizations and fields. If what you are seeking advances a preferred future for others, you will be surprised at how quickly these changes can unfold. You can take comfort in knowing that if you strive to be a collaborative leader you will not be alone at this crossroads of change.