ADEA CCI Vision Focuses on Preparing Graduates for Discoveries of the Future

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Abstract: The vision of the American Dental Education Association’s Commission on Change and Innovation in Dental Education (ADEA CCI) is embodied in its new slogan: building consensus and leading change to prepare graduates for an undiscovered future. The ADEA CCI envisions a future in which dental practice is vastly different from what it is today and dental education must be very different for graduates who face a future of unimaginable scientific discovery. Dental curricula need to change to better prepare today’s dental students, not only for the practice of today but also for the challenges they will face in their practices of the future. The goal of “building consensus” is directed toward the many constituencies that work with dental education and its graduates. The ADEA CCI has developed a variety of policy recommendations, strategies, and resources to help policymakers, dental educators, and dental graduates better prepare for this undiscovered future. A key resource is twenty-two commissioned white papers that cover diverse topics, such as curriculum reform, facilitating change, faculty development, student assessment, and academic leadership.

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Building consensus and leading change to prepare graduates for an undiscovered future: this slogan reflects the interrelated goals of a forward-thinking group of dental educators and partners who aim to promote and support improvements in dental program curricula. Five years ago, the leadership of the American Dental Education Association (ADEA), recognizing that dental curricula needed to change to better prepare graduates for the challenges they would face in their practices of the future, formed the ADEA Commission on Change and Innovation in Dental Education (ADEA CCI). The ADEA CCI’s Oversight Committee serves as a dental education think-tank. Working within the ADEA Center for Educational Policy and Research, this committee is accountable to the ADEA Board of Directors. The ADEA CCI, however, draws its advocacy strength from its inclusionary membership of opinion leaders and experts from the dental education, medical education, higher education, dental accreditation, dental practice, and dental licensure communities.

In a 2006 Journal of Dental Education article entitled “The Case for Change in Dental Education,” members of the ADEA CCI noted that most dental schools have a curriculum “based on a model of educational delivery that is at least fifty years old, while emerging science, technology, and disease patterns promise to change oral health care significantly.” This article called for new curricular approaches that would promote scientific inquiry and research experience and their application to clinical problems. In the ensuing years, the ADEA CCI undertook significant initiatives to help dental school leaders reshape their curricula in light of the needs of current students, the future practitioners of oral health care.

Each element of the ADEA CCI’s slogan, developed by the ADEA CCI Public Relations Task Force, reflects a distinct aspect of the group’s vision. The purposes of this article are to explain each aspect of the slogan and to inform the dental education community about the policy changes being pursued by the ADEA CCI at the national level and the curricular and leadership resources the ADEA CCI has made available to dental school administrators and faculty members.
“An Undiscovered Future”

The ADEA CCI envisions a future in which dental practice is vastly different from what it is today. As Chambers has noted, when the “biological revolution” of the future replaces the “engineering revolution” of the past, “a whole new level of complexity will emerge.” While dental schools do an excellent job of preparing graduates for the practice of today, they do a poorer job of preparing graduates for a future influenced by the complexity of the coming biological revolution.

Dental practice is on a multi-decade continuum of transition in the way oral diseases are treated and care is provided. Dentistry’s history of surgical care, which started with the removal of teeth and sometimes their replacement, resides at one end of the continuum. Dentists eventually determined how to remove diseased enamel and dentin and replace it with other types of materials. As dentistry entered the engineering revolution, these surgical treatments became increasingly sophisticated. That sophistication continues to this day: it remains an important part of today’s dental practice, and today’s dental students must be prepared to provide it. This engineering sophistication requires considerable technical and artistic skills.

As today’s dental students pursue their careers, however, the nature of dental practice will evolve as dentistry migrates to the other end of the practice continuum: the biological practice of the future. Some aspects of oral health care are already further along this continuum than others. For example, periodontal therapy once relied heavily on surgical treatment, including the removal of diseased tissue and the repositioning of other tissues. Now, periodontal therapy uses a much more biological approach, treating diseases at the molecular and cellular levels, with antimicrobial oral rinses and localized, targeted chemotherapies. In the coming decades, other aspects of oral health care will reflect similar evolutionary progress. Recent advertisements have touted a product its manufacturers claim will arrest the progression of incipient caries by infusing alcohol into the lesion to inactivate it and then sealing the lesion surface, all without the use of a handpiece or local anesthesia. While the efficacy of such therapies is not yet known, biological therapies will continue to evolve.

Biological approaches will also evolve that will improve the prevention of oral disease. In the future, oral diseases are more likely to be controlled through their prevention than through their treatment.

Today’s dental students must be well schooled for the practice of today, with its surgical, engineering, technical, and artistic dimensions. They also must be prepared for the biological practice of the future. Within the lifetime of today’s dental students, dental practice is likely to evolve so quickly from surgical to biological that, before their careers are finished, high-speed handpieces will become as extinct as dinosaurs.

“Building Consensus”

The goal of building consensus is directed toward the many constituencies that work with dental education and graduates of academic dental institutions. Like various parts of a biological ecosystem, each constituency contributes to the effectiveness of the group. Diverse opinions form the basis for building consensus, and meaningful change requires broad consensus. Schools, programs, and their missions vary widely. Just as the ecosystem of the wetlands differs from that of the savanna, some schools are research-intensive, others focus on public health, and others make graduating strong clinicians their mission. The ADEA CCI cannot mandate change. Placing the great blue heron on the plains of Africa would have a devastating effect on the wading bird; forcing schools to adopt unwanted and ill-fitting changes would be equally disastrous. The ADEA CCI must lead others to the consensus areas where change can be most beneficial for them.

Early in its deliberations, the ADEA CCI acknowledged that academic dentistry needed an updated set of competencies for graduates because of the many changes occurring in dental practice. With this need in mind, they gave the ADEA Council of Sections the responsibility of developing a new set of competency statements. The council created the document “Competencies for the New General Dentist.” These competencies, approved by the ADEA House of Delegates in 2008, provide a framework for dental education programs to guide curriculum development, reform, and redesign. More descriptive than prescriptive in nature, they outline what needs to be learned in dental school for entry-level competence to enter dental practice.

Over several years, the ADEA CCI commissioned twenty-two white papers that provided ad-
vice, ideas, and philosophies for improving dental education. Those papers covered diverse topics, such as curriculum reform, facilitating change, faculty development, student assessment, and academic leadership. Originally published in the *Journal of Dental Education*, they can be found online at the ADEA CCI website (www.adeacci.org). They contain a wealth of valuable information about teaching and learning in dental education, offer insight into the challenges educators face daily, and promote and encourage faculty development. In 2009, the ADEA CCI compiled these papers into a single volume for ease of use and reference. This hardcover volume, *Beyond the Crossroads: Change and Innovation in Dental Education*, has been widely distributed to dental education administrators and faculty leaders. The leaders of other dental associations, university leaders, and health science libraries received copies as well, and additional copies are available through the ADEA website at www.BeyondTheCrossroads.org.

A particularly important paper in this series was one that presented eight principles for dental education (Table 1). These principles explore ways of helping graduates prepare for the changes in dental practice that will be driven by biological revolution. To teach graduates how to cope with the profound changes they will face, using ADEA CCI principles is paramount, especially the skills of critical thinking, evidence-based practice, and self-assessment. As educators we must do a better job of helping students learn these skills, so they will be better prepared for a future that is, at this point, impossible to predict.

Table 1. Principles to shape the dental education environment

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<th>Principle</th>
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<td>Critical Thinking: Cornerstone of the Dental Education Experience</td>
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<td>Lifelong and Self-Directed Learning</td>
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<td>Humanistic Environment</td>
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<td>Scientific Discovery and Integration of Knowledge</td>
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<td>Evidence-Based Oral Health Care</td>
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<td>Assessment (of Students and Curricula)</td>
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<td>Faculty Development</td>
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<td>The Health Care Team (Interprofessional Education)</td>
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“Leading Change”

The goal of leading change seeks collective and collaborative improvement in the way programs educate students and graduate competent practitioners for the future. The improvements come through changes within the curricula or through curricular policy driving them. These changes may need to be more evolutionary than revolutionary. Marshlands do not become meadows overnight, and communities of scholars will need to discuss, hypothesize, and test new educational theories and methods before adopting them.

Agencies external to academic health centers and their health professions schools and colleges provide accountability to protect the welfare of students and the public that graduates will serve. For example, accrediting bodies ensure compliance with standards for educational programs, including standards for curriculum content and curriculum management. These accrediting bodies can stimulate curriculum reform or stifle it, depending on the content or flexibility of the standards.

Recognizing the potential for the Commission on Dental Accreditation (CODA) to help or hamper curriculum reform in dental education programs, the ADEA CCI partnered with CODA to create a joint ADEA CCI-CODA Task Force. The partners charged the joint task force to develop proposed revisions that would incorporate the eight principles to shape the dental education environment into accreditation standards for dental education programs. The task force recommended substantial rewriting of many of the standards, placing much more emphasis on the development of critical thinking skills as the cornerstone of dental education. Their recommendations were revised further by CODA, and proposed revisions were distributed for public comment. If adopted, the final revisions are expected to take effect sometime after 2011. After a period of dissemination and implementation, all dental schools will devote more attention to the eight principles to shape the dental education environment. Schools will approach these revisions differently, depending on their missions, faculty preferences, and leader visions. But ultimately, the changes will affect all programs, improve their curricula, and better serve their students and the public.

“Preparing Graduates”

The goal of preparing graduates for an undiscovered future reflects the belief that the practice of
dentistry will change profoundly over the next few decades. In the latter part of the twentieth century, the greatest changes in dental practice came from new technology, such as bonding systems, impression materials, implants, digital radiography, rotary endodontics, new drugs, paperless records, and cosmetic dentistry. These changes in dental practice were initiated by manufacturers and the marketplace, with new equipment, devices, materials, and techniques. They reflect the engineering revolution of the past and the industrial age.

In the next few decades, more of these types of changes will come, but the greatest changes will occur through scientific discovery and the biological revolution. Science will yield discoveries we cannot even anticipate today. The discoveries of the future will come from the science of genomics and proteomics, molecular probing, salivary diagnostics, gene therapy, nanotechnology, stem cell guidance, and tissue bioengineering. While the discoveries of the biological revolution promise changes in diagnosis and treatment of disease, they may raise ethical dilemmas that challenge many contemporary beliefs and assumptions. Because of these many potential advances and their effect on individuals and society, dental education must do a better job of preparing graduates for a future that we are at present unable to anticipate.

To provide resources for faculty members to improve the educational experience of their students, the ADEA CCI commissioned the development of two important resources. The resources, or “toolboxes,” provide strategies and techniques using higher order teaching methods that are not as mechanistic as the label might suggest.

One resource created is a Critical Thinking Skills Toolbox, which provides ideas and examples that encourage students to think critically and analytically. Such skills will be important as graduates encounter a future of scientific discovery. These discoveries may challenge long-held assumptions ranging from how to run a business to the appropriate treatment for a patient. Graduates of the future will need to make decisions about increasingly complex discoveries, their interpretation, and their applications. Interested faculty members can access this toolbox online at the ADEA website at www.adea.org/adeacci/Resources/Critical-Thinking-Skills-Toolkit.

A second resource created was a Dental Student Assessment Toolbox, which provides detailed explanations of the various student assessment methods available and the types and levels of skills that can be evaluated with each method. For example, the traditional written examination assesses primarily information recall, while a clinical competency examination assesses the student’s ability to integrate and analyze information, apply that information, and use complex motor skills to provide a service. This toolbox also is published in the Beyond the Crossroads collection.

In addition to the toolbox resources, ADEA sponsors a variety of faculty development workshops each year. Many of them occur at the ADEA Annual Session & Exhibition in the spring or at interim meetings in the fall. The 2010 and 2011 annual sessions use ADEA CCI principles for dental education as their themes. The 2010 theme, “Assessment: Portraits of Change,” attracted a large number of invited and submitted programs in student assessment, faculty assessment, and program assessment. The 2011 theme features another one of the ADEA CCI’s principles, “Interprofessional Education,” and should garner a wide variety of programs, describe ways the health professions can work together to improve oral and systemic health, and create opportunities for networking among members of the various health professions.

To establish a steady flow of ideas and advocacy for curriculum reform to ADEA member schools, the ADEA CCI created a cadre of faculty liaisons, drawn from senior and junior faculty, clinical and research faculty. Like seeds scattered to the four winds, ADEA CCI Faculty Liaisons at fifty-six dental schools are now germinating new ideas and working on curriculum projects at their schools. To nourish and cross-pollinate these ideas, ADEA hosted well-attended liaison workshops each of the past three summers, provided a program specifically for them at the past three annual sessions, and mailed each liaison a copy of the Beyond the Crossroads collection.

ADEA’s Center for Educational Policy and Research publishes a quarterly ADEA CCI Liaison Ledger online newsletter. Typical issues include a feature article, profile of a faculty member, profile of an institution, and ADEA CCI news and dates. Back issues are located at the ADEA website at www.adea.org/adeacci/campus-liaisons/liaison-ledger.

The ADEA CCI’s Future

Activities of the ADEA CCI have resulted in resources to encourage curriculum improvement (Table 2). These offer support to faculty members and administrators who design and implement systemic
changes for future learners since those learners will need to think critically, practice in an increasingly diverse culture, and address many complex aspects of disease prevention, treatment, and cures.

To help disseminate information about the rationale for curriculum reform, activities to promote change and innovation in dental curricula content, and advocacy for improvement in curricular policy, the ADEA CCI established a task force. Formed in 2008, the ADEA CCI Public Relations Task Force has undertaken a variety of strategies to inform various constituencies of activities and resources available. These strategies include presentations at major dental meetings, articles in dental journals and online publication, and marketing items such as print ads and postcards.

To increase awareness of the resources available directly to administrators and faculty members, the ADEA Center for Educational Policy and Research launched a website (www.adeacci.org) specifically for ADEA CCI information. The website contains its own useful content and many links to important information at other websites. As new information becomes available, this dynamic resource will grow and evolve.

The work of the ADEA CCI is central to the future success of dental education, dental practice, and the improved oral health of the public. It will take the active and ongoing collaboration and cooperation of many individuals, associations, and organizations to foster and promote the change and innovation needed in dental education.

**Summary**

Dental curricula need to change to better prepare today’s dental students, not only for the practice of today but also for the challenges they will face in their biologically oriented practices of the future. Recognizing that need, the ADEA CCI implemented several initiatives to help dental school administrators and faculty members improve their curricula and learning experiences. The initiatives to date include proposed revisions to dental accreditation standards; a collection of white papers on change, leadership, assessment, and curricula; and faculty development programs. ADEA CCI Faculty Liaisons at fifty-six dental schools are working on unique change and innovation projects at their schools. They are participating in annual workshops, and they may access resources at the ADEA CCI website. These resources are available to all faculty members and administrators.

These initiatives are directed toward helping dental schools better prepare graduates for a future that is impossible, at this point, to predict. In this future, practitioners must understand the terminology and process of the science driving the biological revolution, think critically about the vast amount of information they will receive, and determine what biological applications work in their clinical practices.

**REFERENCES**