



Point: A 21st-century paradigm for the recognition of dental specialties in the United States

Historical review, lessons learned, looking forward

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ABSTRACT

Background. Specialty-based practice is a fundamental component of US medicine and dentistry, yet the recognition of new dental specialties has markedly diminished in the past 50 years while medical specialization has flourished.

Methods. This article reviews the history of specialty development while focusing on the underlying scientific, educational, and cultural changes in both professions. The process of dental specialty recognition is also examined.

Results. The current dental specialty recognition process provides a set of criteria aspiring specialties need to fulfill at the time of application, yet the relationship between the criteria and the sequence for attaining them is undefined. Scientific development and evidence-based practice have grown to become the cornerstone of contemporary health care specialization.

Conclusions. A new paradigm for specialty and subspecialty development in dentistry is needed. A model is presented herein that recognizes scientific development as the basis for specialization and describes a formal, sequenced process for the development of emerging specialties and subspecialties.

Practical Implications. This new paradigm for dental specialty recognition builds on the current criteria for specialization while encouraging cross-disciplinary interaction and nurturing the development of emerging specialties and subspecialties in dentistry. Doing so will allow dentistry to maintain its lead role in the maintenance of oral health and oral disease treatment in the US population.

Key Words. Dental specialty; dental subspecialty; evidence-based dentistry; entrustable professional activities.

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Specialty-based practice has been an important component of US medicine and dentistry for several decades. In examining specialty development over this period, one is reminded of 2 famous quotes:

“One cannot step twice into the same river.”
Heraclitus (approximately 540-480 BCE)¹

“If you want the present to be different from the past, study the past.”
Spinoza (1632-1677)²

A continuous current of changes in science, social norms, and economics has created unique challenges for the contemporary dentist that few of our predecessors could have envisioned. Failure to critically examine the past would deprive us of important “lessons learned” and compromise our ability to address these challenges. In this article, we examine the role specialties played in the dramatic growth of 20th-century health sciences and proposes a structured, formalized system for fostering emerging specialties, subspecialties, and new specialties on the basis of the maturation of science.

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For the past 70 years, “specialty” has been defined as a field of practice that fulfills a set of criteria at the time of application for specialty status. The new paradigm accepts these criteria but also recognizes that specialties are constantly changing and evolving over time. An equally important consideration is the process by which a specialty develops. As such, the proposed paradigm incorporates the current American Dental Association (ADA) criteria into a dynamic process that blends research, education, and clinical practice into an integrated system.

THE HISTORICAL CONTEXT OF THE 20TH CENTURY

The original challenge, beginning in the 1940s

In a 1951 address to the Navy Dental School, Dr. John Bauer, dean of the University of North Carolina School of Dentistry, reported on the progress of the Council on Dental Education, which had been charged with examining the “problem” of specialization.³ The Council on Dental Education had begun its efforts in 1940 and, except for a 2-year hiatus during World War II, performed a comprehensive study, completing the task in 1947. Seven key issues were identified. The first 4 problems were tied to public recognition and advertising. The remaining 3 issues included state board and legal concerns, educational standardization, and comparison to the approach to specialization used by the American Medical Association (AMA), which had begun recognizing physician specialties in 1933.

A palpable mistrust and skepticism of specialties existed within US dentistry at that time. Many general dentists were concerned that a proliferation of dental specialists would devalue general dentistry, or even restrict the general dentist’s scope of practice. Others were concerned that overspecialization would lead to a confused public and excessive regulation of dentistry. Two contemporary perspectives from that time provide further insight into this controversy. Dr. Walter H. Wright, a prominent dental educator, viewed dentistry as already being the equivalent of a specialty of medicine and stated “the majority of dentists are qualified by aptitude and inclination to practice the entire field of dentistry.”⁴ In contrast, Dr. J.B. Robinson, a longtime member of the Council on Dental Education, stated “the basic dental curriculum represents an irreducible minimum of instruction necessary to equip the dental graduate to begin the practice of his profession.”⁵ In deference to this controversy, Dr. Bauer assured the naval cadets listening to his address that “the general practitioner is and always will be the foundation of our profession, and it is he who will govern the standards of dentistry.”

The 20th-century approach

In their initial report published April 15, 1947, in *The Journal of the American Dental Association*, the Council on Dental Education defined the term *dental specialty* as “a field of practice which calls for intensive study and extended clinical and laboratory experience by a dentist beyond the training offered as a preparation for general practice in the undergraduate curriculum.”⁶ This definition was subsequently adopted and approved by the ADA House of Delegates. In the same report, the Council on Dental Education defined *dental specialist* as “a graduate dentist who, through approved advanced study and the practice of a particular branch of dentistry, attains expert knowledge and skill and who limits his practice to the special field.” All specialties of that time possessed a wide variety of training and skill levels and a mix of part-time and full-time specialists. With these definitions, the ADA followed the lead of the AMA by bringing nationwide standardization to a widely diverse group of practitioners.

The initial growth of specialties after this 1947 report was incredibly rapid. Five specialties were approved later that year: Oral Surgery, Orthodontics, Pedodontics, Periodontics, and Prosthodontics. By the end of 1950, Oral Pathology and Public Health were added as ADA-recognized specialties. After that, specialization in dentistry practically came to a halt. After the acceptance of Endodontics in 1963, no other new specialties would be added until the approval of Oral and Maxillofacial Radiology in 1999, 36 years later.

Although the Council on Dental Education initially sought to emulate the AMA’s approach to specialty recognition, the relative reluctance of dentistry to accept new specialties contrasts sharply with the steady increase in medical specialization throughout the 20th century. Shortly after medical specialization in the 1930s, 20 specialties were recognized by the AMA. When the AMA reexamined specialization in 1970, the number of specialties was found to have grown to 63.⁷ This

ABBREVIATION KEY

- ADA:** American Dental Association.
- AMA:** American Medical Association.
- EPA:** Entrustable professional activity.

pattern of robust growth would also extend to the subspecialties (defined as specialization in a division of an existing specialty). In 2018, the Association of American Medical Colleges listed descriptions of more than 120 medical specialties and subspecialties.⁸ Unlike dentistry, in which most practitioners were generalists, specialization had become the norm in medicine by the end of the 20th century.

There is little doubt that specialization, and the enhanced research that accompanied it, fueled the unparalleled scientific and technological advances in 20th-century medicine.⁹ These research efforts¹⁰ were made possible by the medical educational reforms initiated by the Flexner report, a 1910 study of US medical education commissioned by the Carnegie Foundation.¹¹ Flexner¹¹ called for widespread reform in medical education, strengthened educational standards, and rigorous adherence to the protocols of mainstream science in medical teaching and research. By the time specialty recognition was being addressed, 20 years later, a fertile ground had been prepared for the upcoming revolution in medical science in academic medical training centers. The Carnegie Foundation funded a similar examination of dental education in 1921, enabling the renowned Dr. William J. Gies to undertake a comprehensive, 5-year study of dental education.¹² Gies' landmark report prepared dental education and research for scientific advancement in ways analogous to the Flexner¹¹ report. By the mid-20th century, the long-standing gap between medical and dental education appeared to be closing, leading Gies to envision a time when medical and dental education were blended and dentistry would become "the oral equivalent of a medical specialty."

Gies' enthusiastic vision was not shared by all. A 1925 editorial in the *Boston Medical and Surgical Journal* declared "at least nine-tenths of the work required of dentists is of such a nature that it could be performed with perfect satisfaction with the education already provided in good dental schools."¹³ From the dental side, Edward Kirk, editor of *Dental Cosmos*, agreed. In a 1926 editorial, he lamented that subjects like obstetrics, gynecology, dermatology, and ophthalmology would not be "immediately useful as aids to the intelligent treatment of the mouth" and that under medical education, the restorative and prosthetic aspects of practice would be diminished.¹⁴ Today, nearly 100 years later, we see the value of blending medicine and dentistry in numerous specialized areas such as dental implant osseointegration, salivary research, periodontal disease, temporomandibular disorders, and the elucidation of the toxicity of nitrous oxide.¹⁵ One can only speculate on the type of additional advances that may have been present if the collaboration of medical and dental research had been optimized. Just as Gies' vision was not embraced by all a century ago, current views on specialty recognition are wide ranging and can ultimately be politically, not scientifically, based.

The legal experience

The public need and demand for essential health care services, the cost of medical and dental education, the rise of third-party payment systems, and tension between government regulation and professional self-regulation have been part of the specialty debate since the early 20th century.^{16,17} However, few issues may be more important than those arising from legal challenges to the right of health care specialists to announce and advertise their services.

In 1975, the US Supreme Court found Virginia lawyers liable to charges of price-fixing fees charged for title searches.¹⁸ Before this time, the legal, medical, and dental professions were considered exempt from antitrust accusations because their codes of ethics required them to act in the best interest of the people they served. This landmark decision opened the door for the Federal Trade Commission to bring action against the AMA, the Connecticut Medical Association, and the New Haven County Medical Association, charging restraint of trade by means of restrictions on advertising found within their code of ethics. Seven years later, the Supreme Court upheld the lower court ruling that allowed physicians and dentists to advertise. In 2015, the Supreme Court decided, in *North Carolina Dental Board v Federal Trade Commission*, that state dental boards were not always protected by the state exemption of the Sherman Antitrust Act.¹⁹ These rulings were directly applicable to dental specialists whose specialties were not recognized by the ADA and were therefore restricted by state boards of dentistry. In June 2017, the US Fifth Circuit Court of Appeals upheld a lower court decision that found it unconstitutional for the Texas State Board of Dental Examiners to restrict advertising as specialists to those recognized by the ADA.²⁰ Although this decision only applies to Texas, Louisiana, and Mississippi, the implications of the decision reverberated throughout

Table. The American Dental Association requirements for recognition of dental specialties and national certifying boards for dental specialists.*

NO.	CRITERIA	KEY CONCERN
1	In order for an area to become and/or remain recognized as a dental specialty, it must be represented by a sponsoring organization: (a) whose membership is reflective of that proposed or recognized dental specialty; (b) in which the privileges to hold office and to vote on any issue related to the specialty are reserved for dentists who either have completed an advanced education program accredited by the Commission on Dental Accreditation in that proposed or recognized specialty or have sufficient experience in that specialty as deemed appropriate by the sponsoring organization and its certifying board; and (c) that demonstrates the ability to establish a certifying board.	The chief function of a certifying board is to confirm the competency of a practicing specialist. Item c implies that a specialty can be recognized before the formation of a certifying board. Demonstration of an established, valid, and functioning certifying board should precede the recognition of a body of specialists.
2	A proposed specialty must be a distinct and well-defined field which requires unique knowledge and skills beyond those commonly possessed by dental school graduates, as defined by the Commission on Dental Accreditation's Accreditation Standards for Dental Education Programs.	This requirement hinders the development of subspecialties, which may deepen the knowledge and skill of an existing specialty.
3	The scope of the proposed specialty requires advanced knowledge and skills that: (a) in their entirety are separate and distinct from the knowledge and skills required to practice in any recognized dental specialty; and (b) cannot be accommodated through minimal modification of a recognized dental specialty.	If 2 or more recognized specialties subsume a set of knowledge and skills, which specialty sets the standard of care? Subspecialization provides a mechanism for standardization in this situation.
4	The specialty applicant must document scientifically, by valid and reliable statistical evidence/studies, that it: (a) actively contributes to new knowledge in the field; (b) actively contributes to professional education; (c) actively contributes to research needs of the profession; and (d) provides oral health services for the public; each of which the specialty applicant must demonstrate would not be satisfactorily met except for the contributions of the specialty applicant.	Although items a, b, and c support evidence-based dentistry and research, item d involves a different aspect of specialization and may be interpreted as being legally anticompetitive.
5	A proposed specialty must directly benefit some aspect of clinical patient care.	This requirement is vague and seems to be subsumed by item 4d.
6	Formal advanced education programs of at least two years accredited by the Commission on Dental Accreditation must exist to provide the special knowledge and skills required for practice of the proposed specialty.	No concerns. As is medicine, this requirement affirms the fundamental role of full-time, formal residency training.

* Reproduced from The American Dental Association.²³

the entire profession and US state dental boards. In the course of just 70 years, the role of the ADA in determining specialty recognition had shifted from being empowered protectors of the vulnerable public to the legal equivalent of a trade organization subject to the oversight of the Federal Trade Commission.²¹

Lessons learned

The past 70 years have afforded us a perspective not available to our colleagues in the 1940s, who were charged with creating standards for specialization. We have witnessed remarkable progress in the evolution of dental education and science, witnessed a shift of cultural attitudes and expectations toward health care, and adapted to constraints on our professional ethics imposed by the courts. For these reasons, it is appropriate for us to undertake a fresh examination of the process of recognizing dental specialties to determine how the dental profession may best serve our patients, colleagues, and regulatory boards that look to us for guidance.

Looking forward: a new paradigm of specialty recognition

The ADA defines “dental specialty” as an area of dentistry that has been formally recognized by the ADA as meeting the specified Requirements for Recognition of Dental Specialties.²² The requirements are summarized in the [table](#). As with the original definitions of specialty and specialist in the 1940s, these requirements provide a benchmark for meeting a current standard. They are static in the context that an aspiring specialty either qualifies for recognition or does not. It is highly appropriate that accredited fellowships have evolved within the current ADA-approved specialties over the years. The histories of the recognized dental specialties show that specialties develop and evolve over time. The contemporary practices of Oral and Maxillofacial Surgery and Periodontics, for example, are different from their practices in the 1940s. Furthermore, development of these specialties began several decades before official recognition, and development of those specialties was aided by the announcement and promotion of those services long before the ADA declared them to be recognized specialties. The evolution in those specialties has occurred “within the existing ADA specialty,” rather than “across interdisciplinary science.”

Specialties Develop Over Time

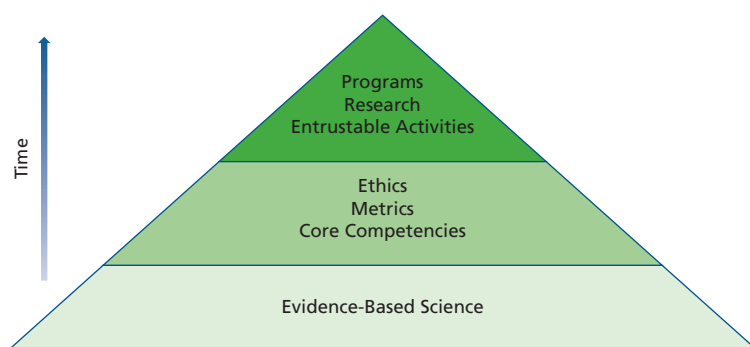


Figure 1. Specialty development is presented as a dynamic process that evolves over time. Evidence-based science forms the foundation and is the first indication of an emerging specialty or subspecialty. The second rung of the triangle represents activities of a sponsoring society, which identifies the core competencies of an emerging specialty or subspecialty and provides means of measuring and evaluating the teaching of those competencies. Professional societies also describe ethics for introducing new methods and technologies into clinical practice. The pinnacle of the triangle is represented by formal specialty status and is marked by the formation of formal, full-time residency programs and subspecialty fellowships that allow mentors to pass on the entrustable professional activities of their specialty. Active research programs, typically associated with the residencies, provide new knowledge and skills, renewing all aspects of the process.

A 21st-century approach reflective of contemporary science and its clinical translation would be a dynamic system by which the stages of specialty recognition are acknowledged as the emerging specialty evolves and develops into a specialty. [Figure 1](#) illustrates this process. All contemporary dental specialties must include a foundation of evidence-based science. It is here that specialties develop a body of new knowledge that integrates with their predoctoral education. Although protocols for evidence-based dentistry may exclude some literature that has value to developing specialists, the core body of knowledge should be one that has withstood the tests of peer review and duplication of new findings by other clinicians and researchers. The appearance of multiple related articles in the literature provides evidence of an emerging dental specialty and helps practitioners distinguish new areas of thought that are solidly grounded in existing science.

The next tier of development occurs when professional societies are formed for the emerging specialty. When a significant number of clinical and scientific reports appear, practitioners will be able to share experiences and describe best practices, leading to the formation of competencies. Competencies are defined as observable activities, performed in dental practice, that integrate essential knowledge, skills, and values. Competencies must lend themselves to measurement, allowing assessment by an observer. They are often discrete tasks that are combined with other competencies in daily practice.^{24,25} Competencies may or may not be unique to a particular dental specialty or subspecialty. In contrast, core competencies are a defined set of competencies that reflect fundamental discrete skills, knowledge, and values that are foundational to a specialty or subspecialty.

The concept of a subspecialty is new to dentistry and at risk of misconception by those less familiar with its use in medicine. Subspecialization in medicine refers to the more narrowly defined scope of practice that falls within the broader scope of an existing specialty or advanced general practice. Dental subspecialty is defined herein as a unique area of dental practice, founded on evidence-based science, characterized by means of a set of well-defined core competencies, and developed with the aid of an existing dental specialty.

Oral and written metrics are required at this stage to assess the effectiveness of teaching all competencies. Certifying boards emerge at this stage to create, update, and administer board examinations. The early creation of strong certifying boards is essential to specialty development because they validate both the educational process and the individual practitioner. With development of new, emerging clinical skills, practitioners will also need to develop a code of ethics that governs how new skills are best applied to patients. A program of clinical outcomes is also necessary to assess and refine core competencies over time.

Subspecialization provides an important avenue for the enhancement of dentistry by means of developing emerging specialties that may have not had the opportunity to develop dedicated residency programs and the research capabilities exhibited by mature specialties. Subspecialties

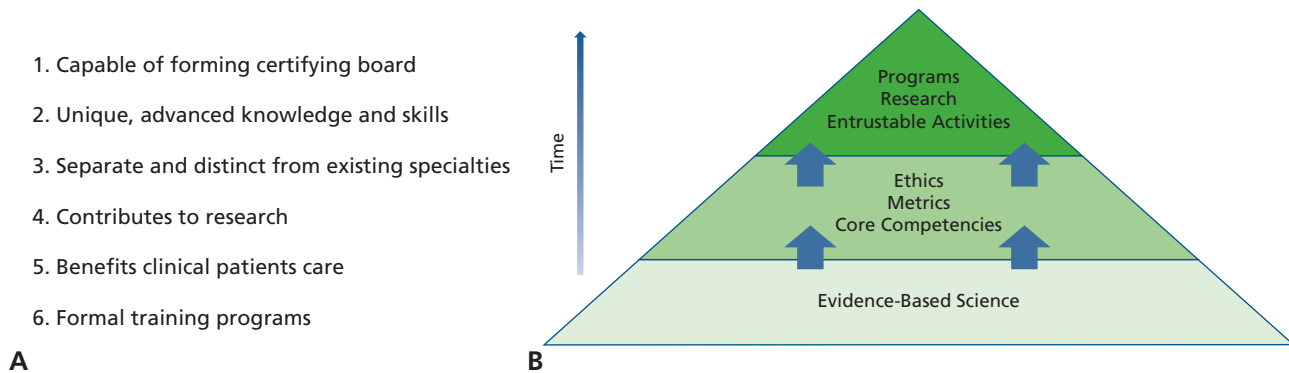


Figure 2. The term “static paradigm” is used in this commentary to describe the current fixed set of requirements that must be met to qualify for specialty status. **A.** It is analogous to a checklist, containing no stipulations on when, how, or in what order the requirements are met. A further example of a static paradigm is the list of prerequisites a candidate must fulfill to be considered for admission to dental school. Numerous educational pathways can and are taken to fulfill those prerequisites. The term “dynamic paradigm” describes a sequence of requirements or milestones that are met as an emerging new discipline ascends to a recognized specialty or subspecialty. **B.** The dental school curriculum is a further example of a dynamic paradigm. Essential preclinical knowledge and skills are provided at the beginning of training, after which students are gradually introduced to clinical practice. The lack of sequence and direction in **A** make it hard to determine which requirements are foundational. For example, requirement 1 states that a prospective specialty must show “the ability to form a certifying board.” In contrast, **B** places the development of a certifying board early in the evolution of a specialty because boards provide the crucial metrics needed for specialty development. Requirement 3 requires new specialties to be separate and distinct from any other existing specialty. However, this policy is likely to unintentionally hinder the growth of new disciplines that may already be part of multiple existing specialties, or a general practice, but significantly deepen the foundation of dental knowledge and skills. In contrast, the new model anticipates the appearance of new disciplines as the foundation of evidence-based practice continues to grow and expand.

proliferated in medicine in the 1940s in concert with the rapid growth of medical science. Although medical subspecialization has always drawn concern from some practicing physicians, few would discount the enhancement of medical science by such subspecialties as cardiovascular disease, infectious disease, medical oncology, and interventional cardiology, to name a few.²⁶ The relationship between a subspecialty and the sponsoring specialty is symbiotic. The specialty is enriched by a deepening of its knowledge base and clinical skill, whereas the subspecialty benefits by its access to the training and research infrastructure of the specialty.

The pinnacle of specialty development occurs when new, dedicated, full-time advanced education programs are formed in a hospital or university to train new specialists. Advanced education training programs are crucial because they allow residents to acquire entrustable professional activities (EPAs) from mentors practicing their specialty. The concept of EPAs is derived from Dr. Olle ten Cate, who proposed a framework for competency-based medical education in 2005.²⁷ He described the EPA as a measurable unit of professional practice, defined as tasks or responsibilities to be entrusted to a trainee once sufficient competence is reached for unsupervised practice.²⁸ EPAs are typically built on the mastery of several competencies and core competencies. For example, the appropriate and effective treatment of a painful tooth is an EPA that might include, but not be limited to, competencies in history taking, clinical examination, diagnosis, radiographic interpretation, and tooth extraction.

In addition to providing advanced education programs, dental specialties are expected to sustain their evolution with the creation of new scientific knowledge through public research in their specialty. The continued vitality of a specialty is validated by means of the replenishment of the evidence-based knowledge base with new publications, which, in turn, renews all of the other elements of the specialty development triangle.

The ADA has made important refinements to the specialty recognition process in the past 25 years. The requirement for specialties to perform a self-examination every 10 years is laudable; however, the focus of those self-examinations is focused within the given specialty. Likewise, the formation of the National Commission on Recognition of Dental Specialties and Certifying Boards in 2017 provides hope for enhancing the objectivity of specialty recognition. To date, however, the ADA has not actively fostered the development of new specialties since the recognition of Oral and Maxillofacial Radiology in 1999, and subspecialties do not exist in dentistry.

We believe our model builds on the foundational work of the ADA while positioning dentistry for a leadership role in health care in America for the 21st century (Figure 2). It incorporates the fundamental value of evidence-based clinical practice with providing enhanced strategic

opportunities for dental providers and for the patients they treat. This modeling also emphasizes the value of dentistry integrating with interprofessional education and clinical practice, a timely undertaking given the metrics of the aging population in the United States.^{29,30}

CONCLUSIONS

Medical and dental specialization, along with the research that accompanied it, fueled remarkable scientific and technological advances in the 20th century. Although both professions shared similar mechanisms for recognizing new specialties, specialization flourished in medicine, whereas dental specialization in dentistry appeared to be stifled after a brief period of limited growth. Cultural, economic, and legal issues contributed to this phenomenon. A new focused process of specialty recognition is proposed that emphasizes scientific foundations and evidence-based practice.

In developing this paradigm, we have strived to think outside our individual experiences and biases and view the future opportunities from a perspective grounded in science and its clinical translation. We recognize that our dental colleagues may or may not agree with our modeling. We will value the collective constructive dialogue as we continue to refine the next steps moving forward. ■

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