Brief Communications

Competencies for Dental Licensure in Canada

Marcia A. Boyd, D.D.S., M.A.; Jack D. Gerrow, D.D.S., M.S., M.Ed.; David W. Chambers, Ed.M., M.B.A., Ph.D.; Brian J. Henderson, B.A.(hons), M.Ed.

Key words: competencies, dental education, certification, licensure, continued competency, curriculum, evaluation, accreditation.

Dr. Boyd is professor, Faculty of Dentistry, University of British Columbia, Vancouver, BC, Canada, and Chief Written Examiner, National Dental Examining Board of Canada, Ottawa, ON, Canada; Dr. Gerrow is associate professor, Faculty of Dentistry, Dalhousie University, Halifax, NS, Canada, and executive director and registrar, National Dental Examining Board of Canada, Ottawa, ON, Canada; Dr. Chambers is professor and associate dean for Academic Affairs, School of Dentistry, University of the Pacific, San Francisco, CA; Dr. Henderson is associate executive director, Canadian Dental Association, Ottawa, ON, Canada. Direct correspondence and reprint requests to Dr. Jack D. Gerrow, executive director, National Dental Examining Board of Canada, 100 Bronson Ave, #203, Ottawa, ON, Canada K1R 6G8.

Since the Gies report of 1926,[1] dental educators have endeavored to design and implement a curriculum that will meet the current and future demands of the complex and dynamic practice environments that dental graduates face during their professional careers. Over the ensuing seventy years, various other reports and surveys[2-6] provided vision and direction for the review and modification of the dental curriculum. Tedesco,[7] in a background paper for the Institute of Medicine (IOM) Study, gives a thorough accounting of the evolution of the dental curriculum, providing evidence of continuing issues that, although widely acknowledged, continue to elude effective curriculum change (e.g., lack of successful integration of basic and clinical sciences, overcrowding, inability to ensure critical thinking, and lifelong learning). Not surprising, then, that curriculum reform has become a major focus again for national meetings and activity in dental faculties across North America. Efforts supported by the PEW Commission,[8] recent presidents of the American Association of Dental Schools,[9-10] and others[11-13] have emphasized the need to refresh the teaching and learning environment, eliminate education-practice discontinuity, and create a more meaningful context for learning.

Most recently, the IOM Study's recommendations numbered 4, 5, and 6 deal specifically with curriculum goals, design, and delivery.[14] The traditional empirical-analytical paradigm for curriculum design relating to educational objectives[15-16] has served well. However, instructional and behavioral objectives with content and discipline-specific emphasis can be reframed into a new integrated curriculum design that will reinforce the relationship between the basic biomedical, clinical, and behavioral sciences. The foundation for this integration is based on developing competency statements that describe the dental graduate. Many agree that defining the competencies expected of a beginning practitioner, the "end product"of predoctoral dental education, provides the basis for rebuilding the curriculum from a segmented, often isolated, format to one that will allow students to learn and perform in a way that more closely resembles how they will be expected to function as practicing professionals.[11, 17] Competency-based education refers not only to the acquisition of the knowledge, skills, and values related to the cognitive, psychomotor, and affective domains, but also includes an integrated mechanism for assessment and evaluation of that education. In other words, competencies can be used to reformat the curriculum as well as to stimulate thought on new or different ways to evaluate the outcomes of

that curriculum. Competencies also support learning and clinical problem-solving in the delivery of comprehensive patient care. Comprehensive patient care, although laudable, has been difficult to achieve because of strong territorial boundaries between disciplines, and clinical treatment that is often requirement-driven. Competencies support integration and merging of all disciplines, which should benefit both students and patients who are receiving treatment. Beyond being used for curriculum analysis and development, competency statements also can provide the foundation standard against which continuing competency is assessed and can be used as a reference in the accreditation process.

A case in point will serve to illustrate the need for, and benefit of, competency statements. In Canada, as a result of a request from the Provincial Licensing Authorities to change the method of certifying graduates of accredited faculties of dentistry in Canada, the National Dental Examining Board of Canada (NDEB) was required to formulate a new examination process. This process necessitated the development of an Objective Structured Clinical Examination (OSCE), a new examination component. As a result, the NDEB formed an examination development subcommittee, comprised of one member representing each of the ten dental faculties in Canada and chaired by the NDEB Written Examination Committee Chair. The subcommittee's charge was to recommend an examination format and to develop a prototype examination. This subcommittee decided that the competencies required for licensure as a general dentist in Canada must be identified in order to develop a valid examination blueprint.

Realizing the need to expedite the development process, the NDEB organized and funded a national forum that occurred four months following the subcommittee's decision. This forum provided the environment and opportunity to discuss and formulate the competency statements and included representation from all stakeholders concerned with the examination and certification of dentists in Canada. The two-day forum was attended by twenty-five invited participants, identified by the NDEB from the various communities of interest. The group included a representative from each of the dental faculties, members of the NDEB executive who represented the provincial licensing authorities, the President of the Association of Canadian Faculties of Dentistry (ACFD), and representatives from the Commission on Dental Accreditation of Canada and the Canadian Dental Association's Council on Dental Education.

The workshop closely followed the process for the development of competencies outlined by Chambers and Gerrow.[18] The workshop participants, working in small groups, used distributed resource material and resource personnel to develop the competency statements. Consistency in the format and level of the statements was facilitated by calibration of the working-group chairs and by review of the statements at plenary sessions. At the final plenary session, the participants approved the draft competency statements and charged a small group with editing the final document. The draft document was distributed to all the communities of interest and workshop participants for review and input. The final document was approved by all workshop participants. This review and approval procedure occurred over a six-month period. The final document was adopted for implementation at the November 1995 NDEB Annual Meeting. The entire process, from identification of need for competencies to final approval, took approximately twenty four months. This relatively short period of time for development and attainment of consensus was perhaps made easier in Canada as the community of interest is small, relative to that of the United States. In addition, the NDEB, which acts on behalf of the provincial licensing authorities, has the mandate and responsibility for national certification.

The competency document was developed primarily for use by the NDEB for the production of the new OSCE examination. The OSCE is a comprehensive three-hour examination using a "station" type format. It is designed to evaluate candidates' clinical judgment and decision-making using case-based items. The examination was piloted in 1994 at all Canadian dental faculties and, as of 1995, all graduates of approved dental programs must successfully complete the OSCE as a component of the Canadian certification process.

The competencies are used as an examination blueprint that is the basis for test item selection. This approach is used to ensure the comprehensive nature of the examination and to enhance the content validity. The competencies are presently being integrated into the written examination component in the same manner. All NDEB candidates receive a copy of the competencies as part of their examination registration materials.

Although the final competency document was developed for use by the NDEB, other organizations that participated in the process have used it as a reference for their own purposes. Obviously, every statement will not suit the needs of various institutions or

Table 1. COMPETENCIES FOR DENTAL LICENSURE IN CANADA

Definition and assumption: Competency is most often used to describe the skills, understanding and professional values of an individual ready for beginning independent dental or allied oral health care practice. "Graduates are competent because they are capable of functioning in realistic practice settings."[18]

Global Competency

A beginning dental practitioner in Canada must be able to provide effective and appropriate oral health care for all patients. Oral health care includes examination, diagnosis, risk assessment, development of a treatment plan and/or treatment plan options, obtaining informed consent and management of the patient's oral health needs in an ethical manner in accordance with the legal requirements of the national and provincial jurisdictions. In addition, a general dentist must be able to justify the diagnosis, risk assessment, and treatment plan based on the etiology, epidemiology, and pathogenesis of the conditions and the biological rationale involved. A general dentist must be able to determine the prognosis and to evaluate the success of the management modalities utilized for individual patients.

Competencies for Beginning Dental Practitioners in Canada

A beginning dental practitioner in Canada must be competent to:

1. communicate effectively with patients, peers, and the public with respect to ethical issues and standards of care.
2. identify the chief complaint or reason for a patient's visit.
3. make a general evaluation of a patient's appearance and attitude including the identification of any abnormal physical, emotional or mental development.
4. obtain and interpret a medical history, social history, review of systems, and dental history.
5. conduct an appropriate clinical and radiographic examination, and distinguish between normal and pathological hard and soft tissue abnormalities of the orofacial area.
6. assess the risks of radiation exposure and the diagnostic benefits of radiographic procedures, and select appropriate radiographs required for a diagnosis, taking cognizance of patient concerns and informed decisions.
7. take and process periapical, bitewing, occlusal, and panoramic radiographs.
8. prescribe clinical, laboratory, and other diagnostic procedures and tests in consultation with other health care providers as may be required for the proper dental and medical management of the patient.
9. interpret the findings from a patient's history, clinical examination, radiographic examination, and from other diagnostic tests and procedures in order to identify the etiology and pathogenesis of oral conditions and growth disorders.
10. establish a diagnosis and develop a problem list of conditions and disorders requiring management.
11. determine the influence of the pathologic physiology of a systemic disease on oral health and management.
12. recognize the limitations of dental treatment in a general practice setting and formulate a written request for a consultation or referral when appropriate.
13. maintain accurate and complete patient records in a confidential manner.
14. develop an appropriate comprehensive, prioritized and sequenced treatment plan based on the evaluation of all relevant diagnostic data.
15. discuss the findings, diagnosis, and treatment options with a patient and inform the patient or guardian of potential modifications and the consequences that could occur during the course of treatment.
16. present to a patient the sequence of treatment, the estimated fees, the payment arrangements, time requirements, and the patient's responsibilities for treatment.
17. modify treatment plans for the medically, mentally, or physically compromised or challenged patient.
18. select and use appropriate barrier techniques to prevent the transmission of infectious diseases.
19. select and use sterilization and disinfection procedures to prevent the transmission of infectious diseases.

20. explain and demonstrate infection control procedures to staff and patients, and respond to questions related to infection control.
21. recognize and institute procedures to prevent occupational hazards related to the profession of dentistry.
22. achieve local anesthesia for dental procedures.
23. prevent, recognize, and manage potential complications related to local anesthesia.
24. determine the indications and contraindications for the use of drugs, the drug dosages, and routes of administration for drugs used in general practice, and write appropriate prescriptions for drugs used in general dental practice.
25. recognized the common signs, symptoms, and etiologies of anxiety and apprehension in dental patients.
26. implement appropriate management of the anxious or apprehensive dental patient.
27. prevent and manage dental emergencies.
28. recognize and manage systemic emergencies related to dental treatment.
29. manage patients with acute and chronic orofacial pain or discomfort, including the provision of treatment normally provided in general dental practice.
30. manage surgical procedures related to oral soft and hard tissues, including the provision of treatment normally provided in general dental practice.
31. manage trauma to the dento-facial complex.
32. manage complications associated with oral surgical procedures normally provided in general dental practice.
33. treat early and moderate forms of periodontal diseases and manage advanced periodontal diseases and monitor the effectiveness of treatment.
34. restore single tooth defects and esthetic problems, including the selection of materials and techniques.
35. manage partially and completely edentulous patients, including providing fixed, removable, or implant prostheses normally provided in general dental practice.
36. manage pulpal pathology or primary and permanent teeth including the provision of endodontic treatment normally provided in general dental practice.
37. assess the dietary intake and oral hygiene status of a patient, in order to promote oral health and evaluate the effectiveness of a patient's self-care.
38. assess the need for and provide appropriate preventive procedures, including topical and systemic therapeutic agents and modalities as well as instruction in mechanical oral health methods.
39. manage growth and developmental abnormalities and treat dental abnormalities normally treated in general dental practice.
40. recognize signs of physical or emotional neglect and/or abuse (including but not limited to child, spouse, or elder abuse) and make appropriate reports and follow up the outcomes.
41. determine malocclusion treatment objectives and identify the treatment required to obtain these objectives.
42. explain the benefits of removable and fixed appliances in orthodontic treatment to patients and guardians.
43. make acceptable casts and other records that are required for use in the laboratory fabrication of dental prostheses and appliances.
44. design a dental prosthesis or appliance, write a laboratory work authorization, and evaluate laboratory products.
45. determine the level of expertise required in the treatment of a patient and recognize the practitioner limitations so that the medical and dental well-being of the patient will not be compromised.
46. obtain informed consent and obtain the patient's written acceptance of the treatment plan and any modifications.
47. locate, read, understand, and critically evaluate the published dental and related literature and apply such information when evaluating new materials and procedures.
48. discharge obligations incumbent upon every professional including personal contributions to and support for the profession's collective initiatives in self-regulation, maintenance of standards, and advancement of professional knowledge and expertise.
49. apply the basic principles of business administration, financial, and personnel management to a dental practice.

organizations. Several faculties have used them as a starting point—and with attention to local priorities, institutional culture, and resources—have modified and gained ownership of the competencies for their own curriculum analysis and planning. The competency document has also been used as a resource by two national dental education associations (AADS and ACFD) in the development of national competency documents and by the Commission on Dental Accreditation of Canada in its accreditation documentation.

In summary, through a cooperative effort, a national consensus document is now in place that describes the competencies required for dental licensure in Canada and by extension describes the competencies required of a Canadian dental graduate. The National Dental Examining Board regards this document as a reflection of its examination process. It is a tool that will both guide and assist in test development and analysis for Canadian graduates as well as for other dentists seeking to practice in Canada.

REFERENCES

1. Gies WJ. Dental education in the United States and Canada. New York: The Carnegie Foundation for the Advancement of Teaching, 1926.
2. Blauch LE. A course of study in dentistry: Report of the curriculum survey committee, American Association of Dental Schools. Chicago: American Association of Dental Schools, 1935.
3. Rourke JT, Miner LMS. Dental education in the United States. Philadelphia: WB Saunders Co., 1941.
4. Horner HH. Dental education today. Chicago: University of Chicago Press, 1947.
5. Douglas BL. A survey of changes in curriculum content in American dental schools since 1935. J Dent Educ 1958;22:177-82.
6. Hollinshead BS. The survey of dentistry: The final report, Commission on the Survey of Dentistry in the United States. Washington: American Council on Education, 1961.
7. Tedesco LA. Issues in dental curriculum development and change. J Dent Educ 1995;59:97-147.
8. O'Neil EH. Health professions education for the future: Schools in service to the nation. San Francisco: The PEW Health Professions Commission, 1993.
9. Dugoni AA. President's annual report, 1994-95. J Dent Educ 1995;59:687-90.
10. Tedesco LA. "All the thinks you can think: Crossroads, renewal, and changes." J Dent Educ 1995;59:681-6.
11. Chambers DW. Toward a competency-based curriculum. J Dent Educ 1993;57:790-3.
12. Statement by the Council of Deans to the Institute of Medicine. J Dent Educ 1994;58:378-94.
13. Mulvihill JE. Insights on a new era under a reforming health care system. J Dent Educ 1995;59:620-7.
14. Field MJ. Dental education at the crossroads—A summary. J Dent Educ 1995;59:7-15.
15. Bloom BS. Taxonomy of educational objectives: Cognitive Domain. New York: McKay, 1956.
16. Magher RF. Preparing instructional objectives. Palo Alto, CA: Feron, 1962.
17. Fonseca R. The challenge to dental education: Educating dentists for the future. J Dent Educ 1995;59:655-8.
18. Chambers DW, Gerrow JD. A manual for developing and formatting competency statements. J Dent Educ 1994;58:361-6.