

Cariology Education in Canadian Dental Schools: Interinstitutional Symposium

Svetlana Tikhonova, PhD; Neha Aggarwal, MSc; Felix Girard, MSc.



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Dental caries remains one of the most prevalent chronic diseases worldwide.¹ Approximately 60% of Canadian children, adolescents and 96% of adults are affected by this burdensome, costly condition. Up to 12 million Canadians have unmet dental treatment needs – often related to caries – with most requiring restorative and preventive care.² Recent studies suggest that the operative-based approach of managing dental caries continues to prevail among dental practitioners, with teeth entering the re-restorative cycle unnecessarily, or too early.³ This evidence highlights the need for more efficient approaches to bringing evidence-based caries management into practice and accepting the new paradigm. Undergraduate dental education plays an essential role in establishing the foundation of future dentists' caries management practices and can accelerate the processes to implementation of the new caries paradigm into dental practice.⁴ A Core Curriculum Framework in Cariology, designed for undergraduate dental students, was recently introduced in several countries around the world.^{5,6} The main purpose of this framework was to develop essential evidence-based competencies related to Cariology education that could be readily adopted in dentistry education.⁷ Currently in Canada, there is no consensus among dental schools regarding core elements related to the Cariology curriculum.⁸ Thus, there is a need for the harmonization of evidence-based Cariology teaching in Canadian dental schools to ensure that dental students are appropriately trained to implement the new caries paradigm into practice.

In this context, a two-day interinstitutional symposium on Cariology education in Canadian dental schools was organized and hosted by Drs. Tikhonova and Girard in Montreal, McGill University faculty of dentistry (November 2018). The overall aim of the symposium was to bring together experts in Cariology and dental education, researchers and knowledge users to develop a consensus on an evidence-informed Core Cariology Curriculum, including strategies and research agenda for enhancing its implementation in Canadian dental schools. The symposium participants included Cariology educators from all ten Canadian dental schools, national and international educators and researchers with expertise in Cariology, curriculum implementation and reform (e.g., academic deans, dental clinical directors, clinical instructors) and research trainees. A Transformational Learning Theory framework was used,⁹ which helped the participants to reach an informed, objective and rational consensus about the actions needed to be in place to enhance undergraduate Cariology education in Canada.



Cariology Education in Canadian Dental Schools' symposium participants, November 2018.

The **first day** of the symposium was dedicated to building a consensus on Core Cariology curriculum for Canadian dental schools. To begin with, the American and European Core Undergraduate Cariology Curriculums were introduced by two invited speakers, followed by a presentation about the current state of Cariology Education in Canadian dental schools.⁸

Drawing on the American version of Core Cariology curriculum,⁶ the participants worked in groups and reviewed the specific domains of the curriculum: 1. knowledge base; 2. diagnosis, risk assessment, and synthesis; clinical decision making; 3. non-surgical therapy, 4. surgical therapy; and 5. evidence-based cariology in clinical and public health practice

Collective discussion followed, focused on priorities, common learning objectives and outcomes for Cariology education in Canadian dental schools. Ultimately, the participants were able to come up with a draft consensus document of an adapted version of Core Cariology Curriculum for Canadian dental schools. This document will be reviewed again by the cariology educators from each

Canadian dental school. At this time more than one representative (e.g., academic deans, clinic directors) from each dental school will be invited to review the curriculum and the final document will be published.

The **second day** was dedicated to discussing the integration of the Core Cariology Curriculum in Canadian dental schools' settings. The main principles and methodology of knowledge translation intervention were presented and followed by small group and then general discussions on the a) anticipated challenges and solutions for the Cariology curriculum integration; b) the setting up a research agenda in undergraduate Cariology education.

Cariology curriculum integration

Challenges:

- There is a gap between the implementation of didactic teaching and clinical cariology teaching:
 - Absence of cariology curriculum;
 - Imbalance between preventive dental care and

- o surgical procedures;
- o Lack of evidence-based practice approach among cariology clinical instructors;
- o Shortage of well-educated staff for implementing the evidence-based cariology into educational settings;
- o Lack of interaction among the various dental health professionals in the context of clinical cariology teaching (e.g., clinical instructors and dental hygienists);
- o Lack of calibration of clinical cariology instructors in caries diagnosis and treatment planning;
- o Part time clinical instructors: repeated training issue; inconsistency in caries management approach;
- o Discontinuity of cariology training among different school years of dental education;
- o Inconsistent cariology follow-ups among patients;
- o Lack of credits related to non-operative treatment of caries in dental schools.
- Dental curriculum is already overloaded in terms of didactic and clinical teaching;
- Lack of educational expertise to support cariology curriculum change;
- Complex/non-updated dental software used in clinical settings.

Solutions:

- Support from academic deans, associate deans, clinical directors;
- Building inter-university cariology education sharing platform;
- Using the same nomenclature in cariology;
- Building working groups to coordinate Cariology curriculum implementation in academic settings;
- Reward points system for the academic staff involved in cariology curriculum implementation;
- Introducing cariology curriculum from the first year of undergraduate schooling;
- Involve residents/graduate dental students in the undergraduate cariology training;
- Integrating evidence-based dentistry exercises in the undergraduate dental clinic;
- Commencing periodic follow ups to assess caries risk and caries lesions status;
- Training sessions for clinical instructors and dental students in caries lesions diagnosis;

- Incorporating dental hygienists in the context of undergraduate cariology clinical training;
- Integrating cariology into restorative or other “hot” topics of continuing education courses for clinicians/clinical instructors.

Future research project(s):

Outcomes:

The outcomes of interest related to the implementation of cariology curriculum can be measured among patients, students, clinical instructors, general practitioners.

- Monitoring caries progression;
- Caries risk changes;
- Number of non-surgical therapies;
- Number of hours devoted to the didactic cariology teaching;
- Knowledge and clinical decision-making process;
- Patients' perspectives on care and caries management;
- Continuing education courses evaluation.

Study designs/instruments:

- Developmental evaluation of educational models;
- Qualitative studies (e.g., observations and interviews);
- Experimental studies;
- Dental charts reviews;
- Surveys.

Potential challenges related to project implementation:

- Clinical time: several recall appointments related to implementation of non-operative treatment strategies;
- Level of communication between students and professors (both groups need to be trained);
- Building the same language within the community of practice and different stakeholders;
- Be organized, have leaders, have money.

Conclusion:

- A preliminary consensus on an evidence-informed Core Cariology Curriculum for Canadian dental schools was achieved;
- Participants agreed to continue to work collaboratively on implementing the cariology paradigm in Canadian Dental Education and

practice;

- The integration of Cariology paradigm in Canadian Dental Education and practice creates new opportunities for research.

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THE AUTHORS



Dr. Tikhonova is faculty lecturer, faculty of dentistry, McGill University, Montreal, Quebec.



Dr. Aggarwal is research assistant, faculty of dentistry, McGill University, Montreal, Quebec.



Dr. Girard is associate professor, faculty of dentistry, University of Montreal, Montreal, Quebec.

Correspondence to: Dr. Svetlana Tikhonova, Faculty of Dentistry, McGill University, 2001 McGill College Ave., Montreal, Quebec, H3A1G1, Canada. Email: svetlana.tikhonova@mcgill.ca

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