

Promoting Quality in Nursing Education in Canada through a Canadian Examination for Baccalaureate Nurses

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Abstract

Since its creation in 1942, the Canadian Association of Schools of Nursing's mandate has been to foster high-quality nursing education in Canada in the interest of healthier Canadians. To this end, the Canadian Examination for Baccalaureate Nurses/l'examen canadien du baccalauréat en sciences infirmières (CEBN/ECBSI) has been developed and will be launched in 2020. Its purpose, what the Canadian Examination for Baccalaureate Nurses designation signifies and the development of the examination are described.

Purpose

The Canadian Association of Schools of Nursing (CASN) is launching an exit exam, the Canadian Examination for Baccalaureate Nurses/l'examen Canadien du baccalauréat en sciences infirmières (CEBN/ECBSI). The purpose of this examination is to promote high quality baccalaureate education in Canada – CASN's mission since it was first established in 1942.

The mandate the founders of the Canadian Association of Schools of Nursing (CASN) adopted included determining desirable standards for baccalaureate programs of nursing to meet and improving standards of existing university programs of nursing (Kirkwood and Bouchard 1992). As a result, *Desirable Standards for Canadian Schools of Nursing – Normes souhaitables pour les écoles de sciences infirmières canadienne* was published in 1957, specifying quality expectations for teaching, learning and curriculum. The CASN has continued to determine and promote quality expectations for nursing education since this publication. Current activities, for example, include a National Framework for Nursing Education, the CASN Accreditation Program and the Canadian Nurse Educator Institute's certification programs for nurse educators.

Assessment, Evaluation and Quality

Assessment and evaluation of learning often affect what individual students learn and the quality of their education programs. Assessment is an appraisal process involving data collection to provide evidence on what has or has not been learned (Miller et al. 2013). Thus, assessment tools identify what students should be learning. Evaluation refers to the judgments that are made about the value or degree of learning that has occurred based on the interpretation of the assessment data collected. The results of an evaluation are used to inform the learner, the education program and others about the adequacy of the learning that has occurred. Together, assessment and evaluation often drive both teaching and learning (Oermann and Gaberson 2017).

Quality Expectations

As noted, the CASN's mandate is to promote quality in nursing education. There are, however, a multitude of understandings of what this concept represents. Harvey and Green (1993) grouped definitions of quality into five categories: (1) exceptional and something special, (2) value for money, (3) perfection in which quality specifications are all met, (4) transformation and (5) fitness of purpose. The most common understanding of quality in higher education is fitness of purpose. From this perspective, assessment of quality measures indicators that this purpose is being met.

Quality as Fitness of Purpose

Determining and selecting learning outcomes that are good indicators of the fitness of purpose of professional education programs is challenging. This is especially so for baccalaureate programs of nursing in the current Canadian context. Graduates enter a dynamic field of practice that not only is highly complex but also includes a multitude of patient populations, a multitude of diverse specialized practice areas and widely varied care delivery settings. Moreover, the technology, knowledge, skills and organizational practice systems are in continuous evolution in all areas of care. Often what is current and expected practice when a student begins a baccalaureate nursing program is no longer so four years later when they graduate. In addition, health professionals in Canada must manage and mitigate multiple, often life-threatening, system-based risks to patients' safety. They also face significant ethical issues and dilemmas related to multiple factors including, but not limited to, informed consent, confidentiality, patient autonomy, incompetence of professional colleagues, the safety of the work environment itself and end-of-life decision making.

The aim of creating the Canadian Examination for Baccalaureate Nurses/*l'examen canadien du baccalauréat en sciences infirmières* (CEBN/ECBSI) was to develop a psychometrically sound examination that identifies, assesses and evaluates

learning that is contextually relevant for graduates of baccalaureate programs of nursing in Canada.

The following objectives guided this initiative:

1. to develop a psychometrically sound, valid and reliable examination to assess and evaluate learning outcomes that are essential for new baccalaureate-prepared nursing graduates to possess as they enter the profession, the workforce and the Canadian healthcare system; and
2. to provide successful candidates with a national designation and certificate of educational achievement that informs the public and future employers that they have mastered this learning.

What Success on the CEBN/ECBSI Signifies

The impact an examination has on the quality of what is being taught and what is being learned depends on what it assesses. The blueprint for an examination, also known as a test plan, specifies this and is therefore critical to the quality of the learning being fostered (Oermann and Gabeson 2017). It is essential that the blueprint measures learning that effectively captures indicators that reflect the fitness of purpose of professional education in a given societal context.

Based on the CASN National Education Framework, the CEBN/ECBSI blueprint is the fruit of a modified Delphi methodology involving a national panel of experts, an extensive national input and a national validation survey. It identifies four overlapping nursing roles and essential learning outcomes for each (Table 1), determines levels of learning and types of questions being used (Table 2) and identifies the diverse client populations and practice settings being targeted by the questions (Table 3).

Table 1. Percentage of questions by categories

Category	Percentage of questions
Evidenced-informed knowledge worker	9–19
Entry-level clinician	54–64
Communicator and collaborator	8–18
Health professional/change agent	9–19

Table 2. Percentage of questions by level of learning

Type of question	Percentage of questions
Knowledge/understanding	10
Application	40–50
Clinical reasoning and judgment	40–50

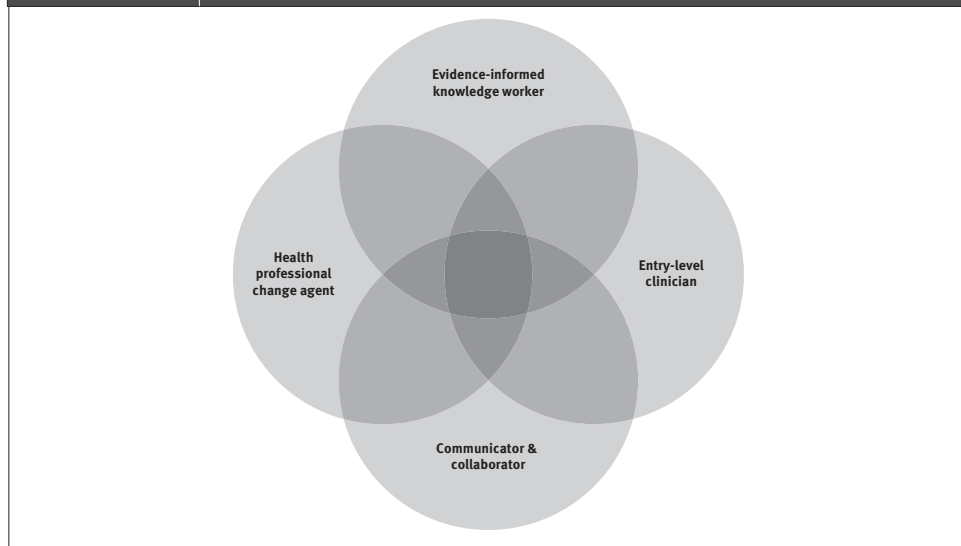
Table 3. Percentage of questions by phase of life

Phase of life	Percentage of questions
Newborn	3
Infant, child, adolescent	15
Adult	24
Childbearing person	13
Older person	31
End-of-life	9

Of the questions, 5% target population health, and there is no fixed percentage by age group for these questions.

Roles and Learning Outcomes

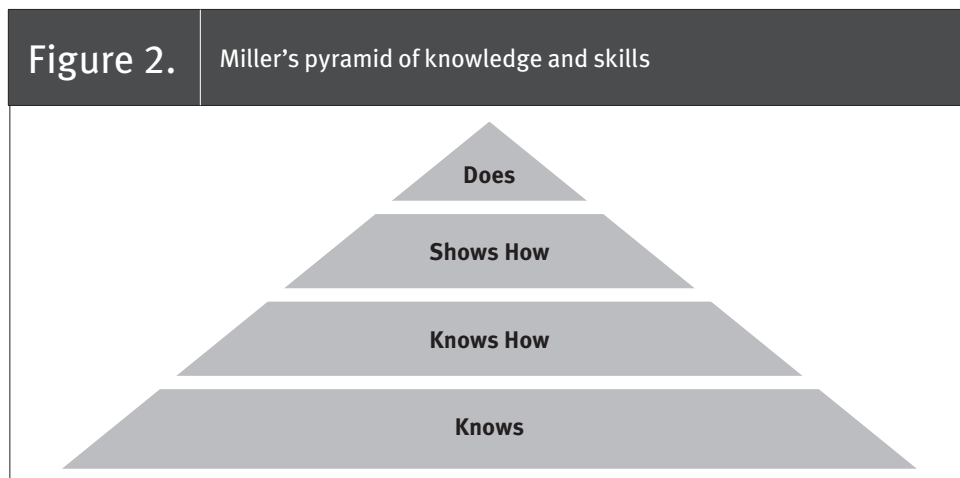
The CASN National Framework for Baccalaureate Education (CASN 2015) identifies the essential components of six learning domains for baccalaureate programs of nursing: knowledge, research, entry-level practice, communication and collaboration, leadership and professionalism. It provides the foundation for the nursing roles and learning outcomes that the CEBN/ECBSI tests. The knowledge and research domains were collapsed into the evidence-informed knowledge worker role, the practice domain was identified as the entry-level clinician role, the communicator and collaborator domain became the communicator and collaborator role and the leadership and professionalism domains were collapsed into the health professional change agent role (Figure 1).

Figure 1. Density plots of GPAs by year across sites

GPA = grade point average.

Level of Learning

The ultimate level of learning for graduates of professional education programs is to practise their profession appropriately and effectively. Miller's pyramid of knowledge and skills (Figure 2) identifies progressive learning levels needed for professional practice (Miller 1990). Cognitive knowledge, or *Knows*, is the base learning required and is the foundation of Miller's pyramid of professional learning. It is assessed by written assignments and examinations. At the next level of the learning pyramid, referred to as *Knows How*, the learner is able to use knowledge to analyze and interpret case situations, synthesize data, make judgments, solve problems and develop plans of action. Because this level of learning is verbally mediated, it can also be evaluated through written examinations. The third level, *Shows How*, involves performance. Assessment, therefore, requires observation of the performance, although this may be in artificial situations such as simulations or an Objective Structured Clinical Examination (OSCE). The highest level of professional learning in Miller's pyramid, referred to as *Does*, involves the ability to integrate competencies and perform appropriately in real-life practice. Although this is the ultimate goal of professional education, this learning level can only be assessed by observing the graduate's actual workplace performance (Downing and Yudowski 2009). Moreover, a considerable body of research demonstrates that practice in the workplace following graduation is necessary before this level of learning is attained (Duchscher 2018).



Because the CEBN/ECBSI is a computer-based written examination, the blueprint targets the knowledge and application levels of Miller's pyramid of learning. Mastery of these levels of learning, however, is critical for competent nursing practice. The baccalaureate-prepared nurse requires a solid and in-depth understanding of nursing knowledge as well as knowledge from other disciplines, the ability

to apply this knowledge to multiple types of nursing situations and the ability to use clinically relevant cognitive skills, including evidence appraisal, problem solving, clinical reasoning and clinical judgment.

Types of Questions

The CEBN/ECBSI is computer-based but not a computer-adaptive exam with approximately 200 multiple-choice questions on each of three examination forms. The questions test knowledge (10%), application (40–50%) and clinical reasoning and clinical judgment (40–50%). Knowledge questions focus on the candidates' understanding; application questions target their ability to apply what they have learned; clinical reasoning questions are concerned with a cognitive process of observation, reflection, analysis and interpretation of observable or available clinical data; and clinical judgment questions involve the synthesis of clinical observations and data to determine an optimum course of action.

Client Populations and Practice Settings

Nursing education in Canada prepares generalists who are expected to care for a diversity of clients across the lifespan and in a variety of settings. Thus, test questions address the following populations: (1) newborn; (2) infant, child, adolescent; (3) adult; (4) childbearing person; (5) older person; and (6) end-of-life. Recipients of nursing care may be an individual, a family, a community or a population. A variety of settings provide the context of caregiving, including community clinics and agencies, the workplace, primary healthcare centres, homes, long-term care, rehabilitative care, mental health and addiction facilities, acute care, care delivered in rural and remote communities as well as care delivered at a distance from the client using information and communication technologies.

Development of the CEBN/ECBSI

In 2017, the CASN Board of Directors adopted a formal motion to develop a national, voluntary bilingual examination for new graduates of baccalaureate nursing programs, in light of the impact evaluation has on the quality of nursing education, on the quality of the next generation of nurses and ultimately on the health of Canadians. As noted earlier, the objective was to determine and test learning outcomes that are effective indicators of the fitness of purpose of baccalaureate education in Canada, thus addressing current gaps in the national assessment of baccalaureate nursing graduates. Two years earlier, Canadian regulatory bodies in jurisdictions other than Quebec replaced the national registration examination of the Canadian Nurses Association. This examination tested baccalaureate-prepared nurses, the entry-to-practice requirement in Canada except in Quebec. Quebec had been using, and continued to use, its own provincial registration examination. The Canadian Nurses Association exam assessed graduates on entry-level competencies for baccalaureate nursing graduates in Canada. In

contrast, its replacement is the licensing examination for registered nurses in the United States, where the baccalaureate is not the entry-to-practice requirement. In addition, although there are a great deal of similarities in nursing care and healthcare delivery in the United States and Canada, the American system is a for-profit one and does not provide universal coverage. Thus, it is not based on the principles of universal, portable, accessible and comprehensive care, as is the case in Canada. This difference impacts the nature of nursing care and also appears to impact the health of the population in each country. On international comparisons of health systems and health indicators, Canada consistently ranks higher than the United States (World Health Organization 2018).

A rigorous analysis of the test plan of the new licensing examination in 2015, against the entry-to-practice competencies required by Canadian regulatory bodies, confirmed the existence of important assessment gaps. It revealed that 65% of these competencies are not addressed or only partially addressed by the American examination (CASN 2015).

In Quebec, the provincial registration exam that continued to be used does reflect the local context of healthcare. Gaps exist, however, for baccalaureate nursing graduates because, like the American licensing exam for registered nurses, it is designed to test diploma-prepared nurses.

It is important to point out that the CASN is an association of Canadian schools of nursing and not a regulatory body. It does not, therefore, determine what examination, if any, will be used for registration purposes in provincial or territorial jurisdictions. As discussed, the goal in developing the CEBN/ECBSI was, and is, to foster fitness of purpose in nursing education as part of the CASN's mandate to promote quality. In 2017, however, in response to a specific request from the Nurses Association of New Brunswick, the CASN Board of Directors adopted a motion to make the CEBN/ECBSI exam available as a high-stakes, bilingual registration exam and to collaborate with one or more regulatory bodies wishing to use it as such. Thus, the exam development methodology meets the requirements of such exams, and information about it is formally provided to regulatory bodies in all jurisdictions through the Canadian Council of Registered Nurse Regulators. Support of francophone member schools was a critical factor in the board's decision to adopt this motion. At the annual meeting in November 2016, the heads of the CASN member schools had voted unanimously on a motion calling on the association to support and find solutions for francophone member schools that were experiencing disastrously low pass rates on the new registration exam, attributed to translation issues and a lack of preparatory resources in French. Making a bilingual examination available as a registration option offered a solution to this situation.

Governance Structure

Four committees were established with representation and expertise from all parts of Canada, both linguistic groups, diverse sectors of nursing including several regulatory bodies and a variety of health services, the College of Physicians and Surgeons, the Association of Faculties of Pharmacy and relevant stakeholder associations. The Examination Committee guides the process and approves the blueprint, the standards for its administration and the examination forms. The Advisory Committee provides input and recommendations into the blueprint development and exam delivery process. The Examination Review Committee conducts the final review of the items and the examination forms, sets the standard for the passing mark and performs the post-examination psychometric review of test items. The Stakeholder Advisory Committee comprises representatives of the Canadian Patient Safety Institute, Infection Prevention and Control Canada and the Interprofessional Collaboration Network of Canada. They review the exam blueprint and make recommendation to the Examination Committee in relation to the integration of the national patient safety competencies, infection prevention and control competencies and interprofessional collaboration competencies. In addition, the National Association of New Brunswick formed a committee that conducted a regulatory review of the examination forms in both English and French.

Linguistic Plan

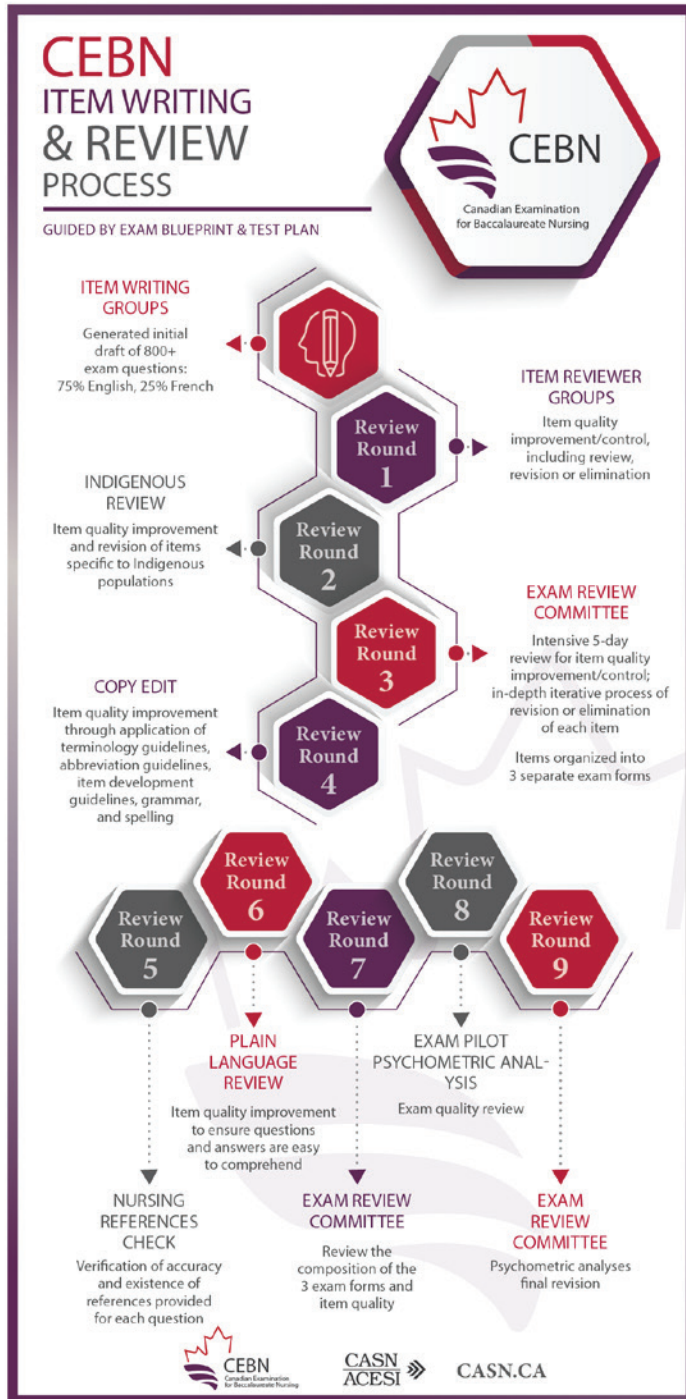
As a goal of the CEBN/ECBSI was to provide a bilingual (English and French) national examination for baccalaureate programs of nursing, engaging both linguistic communities in its development was a priority. There is, therefore, a francophone co-chair of the Examination Committee and of the Advisory Committee. Between 25% and 35% of the items are developed in French and translated into English. Both French and English panels write and review items. A rigorous translation/adaptation process is used involving experienced Canadian translators, linguistic panel reviews and the use of a comprehensive lexicon. All examination materials are provided in both languages, exam proctors in francophone regions speak French and the exam software allows candidates to toggle between French and English versions of the examination.

Item Development, Test Design and Assembly

The exam development involved a rigorous multistep process of review and revisions (Figure 3).

Item writers from nursing education and service developed the first draft of the test questions. They receive an item-writing manual (*CEBN Item Writing Manual*); training from the psychometrician; a document that identifies the purpose, goal, scope and content specifications (the *Canadian Examination for Baccalaureate*

Figure 3. CEBN item writing and review process



Nursing Candidate Handbook); and the *CEBN Style Guide* specifying spelling, preferred terminology and acceptable abbreviations. Rationales for all multiple-choice options and two recent references for each item are required.

The psychometric team developed three examination forms aligned with the specification of the blueprint. The exam form assembly and its items are reviewed and revised by the Examination Review Committee whose members include representatives from nursing education, service and regulation. All also have exam development experience and expertise. The revised examination forms undergo a nursing reference check by the CASN nursing staff to ensure each item is appropriately supported. A copy-edit is carried out, followed by an indigenous review, a plain language review and another final review by the Examination Review Committee.

Pilots, Statistical Analyses and Standard Setting

The CEBN/ECBSI was piloted across Canada in April 2019. Although a purposeful sample of 346 candidates registered, only 249 came to the exam sitting. The criteria included ensuring candidates were from all regions of Canada, including the far North; from colleges, small universities and research-intensive universities; and from both linguistic groups. Although this was achieved, the goal was to have approximately one third write the examination in French, and the drop in candidates reduced francophone representation. Further pilot testing was, therefore, conducted among a sample of 69 recent graduates of francophone programs in Quebec in September 2019, and the one-third goal was reached.

The psychometric statistical evaluation of the pilots indicated that the CEBN/ECBSI performed very well, and the pass rate for the pilots in Quebec was the same as the pass rate of the earlier pilot. The Examination Review Committee reviewed items based on the statistical screening process and excluded some from the final scoring. Following their removal, the passing standard was set by the Examination Review Committee using the modified Angoff standard setting method. Equating, the statistical process to determine comparable scores on alternate examination forms, was also carried out, and results demonstrated their equivalence.

Conclusion

Because of the extensive knowledge, valuable experience and high level of expertise that so many Canadians across the country have contributed to its development, the CEBN/ECBSI will be ready for release in 2020. It will be offered three times a year to graduates of baccalaureate programs of nursing, who will be eligible to sit the exam once all requirements for the degree are successfully completed and up to one year following this. The exam delivery will be either through

the existing exam delivery centres of the CASN's partner Yardstick Assessment Strategies or in exam centres in member schools that are set up to meet the security requirements of high-stakes exams.

Although the CEBN/ECBSI is a voluntary academic certification examination, a number of schools are planning to require their graduating students to sit for it as an exit exam. Some regulatory bodies have expressed an interest in adopting the CEBN/ECBSI for registration in their jurisdiction, but none has done so to date. Moreover, several have published official statements informing future registrants that the CEBN/ECBSI is not recognized as a registration exam in their jurisdiction. Although it will be maintained as a viable option as a registration exam, the primary goal of this initiative is to promote high-quality nursing education in the interest of healthier Canadians through a voluntary, rigorous examination that addresses the full range of core, cognitively mediated learning that entry-level baccalaureate nurses require in this country.

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