Optimizing the New Model of Nurse Practitioner Regulation in Canada to Support the Integration of Genomics

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Abstract
The demand for genomic services has outpaced the capacity of the health system, thus creating opportunities for nurse practitioners (NPs) to develop genomic literacy and expand the genomics-informed services that NPs can offer to optimize safe and equitable healthcare. The new model of NP regulation that aims to educate all NPs, based on a set of common entry-level competencies, has the potential to accelerate the integration of genomics into education and practice. In this commentary, we explore opportunities within a new NP regulatory framework and highlight how NPs can strengthen Canadians' access to genomic technologies as clinicians, advocates, leaders, scholars and educators.

Background

Advancements in genetics and genomics are enabling precision healthcare, where services are tailored to a person's genetic makeup. These new technologies have proven to decrease disease burden, improve quality of life and health outcomes

and contribute to cost savings (CIHR 2022; Ersig and Walker 2023; Regier et al. 2024). However, the demand for genomic services has outpaced the capacity of the health system (Carroll et al. 2021; Dragojlovic et al. 2023), creating access barriers to genomics-informed care and exacerbating health disparities. To meet the increased demand for the integration of genomic technologies, it is imperative to create opportunities for all members of the health workforce, including nurse practitioners (NPs), to develop genomic literacy and expand their potential to offer genomics-informed healthcare services.

The number of NPs continues to rise, and in May 2024, there were 10,790 licensed NPs in Canada (NPAC 2024). Most of these NPs are employed in direct care roles in community health organizations and hospitals (CIHI 2024). NPs use their knowledge and experience as registered nurses and their graduate-level education to prepare themselves to provide primary, secondary and tertiary care across the healthcare continuum, including assessing, diagnosing, prescribing, treating and managing client care. The ongoing scope of practice optimization efforts by NPs creates potential opportunities to integrate and accelerate safe and equitable genomics-informed healthcare into NP practice (Acorn 2022), making this an ideal opportunity to leverage the leadership and innovation that NPs bring to health systems locally, nationally and globally (Acorn 2021; Acorn and Lehwaldt 2024). In this commentary, we explore the opportunities within a new NP national regulatory framework and identify tangible actions that NPs can take to strengthen their contributions to genomics-informed healthcare in Canada.[1]

Opportunities for Expanding Genomics-Informed Healthcare Under a New NP Regulation Model

Currently, NPs are educated and regulated in most Canadian provinces and territories according to their category or stream of practice (CCRNR 2023a). In 2020, the Canadian Council of Registered Nurse Regulators commissioned the Nurse Practitioner Regulation Framework Implementation Plan Project to introduce a new model of NP regulation (CCRNR 2023b). This new model aims to educate all NPs using a set of common entry-level competencies and includes a single entry-level exam to prepare and credential NPs to care for clients across the lifespan in all settings in every province and territory. While the move toward this new regulatory model has not been without critique, we believe that it creates opportunities for consistently integrating the field of genomics into all NP education programs. We envision that this will result in a future state where all new NP graduates entering the workforce have foundational knowledge, skills and competencies to deliver genomics-informed care, regardless of practice area. Furthermore, we anticipate that the inclusion of genomics into NP education will motivate NP faculty to develop knowledge and proficiencies in genomics-informed care, which will enable them to eventually teach this component of the NP education program.

Genomics and the NP Role

Evidence from other jurisdictions illustrates that nurses with genomic literacy can support patients through risk identification and management, screening, diagnosis, treatment selection and monitoring across the lifespan and healthcare continuum (Calzone et al. 2024). The revised national entry-level competencies for NPs follow a role-based framework that embeds 29 competencies grouped thematically under five domains: clinician, advocate, leader, scholar and educator (CCRNR 2023a). To illustrate how the inclusion of genomics into entry-level competencies can support all NPs entering the workforce to be prepared to integrate genomics into their role, we provide some examples below.

Clinical domain

NPs could use genomics knowledge and skills to conduct a comprehensive health history and identify familial hereditary clusters by completing a three-generation pedigree. They could also collect a pharmacological history, recommend pharmacogenomic testing and use test results to ensure optimal prescribing for an individual's genetic constitution (CPIC n.d.). They might order genetic testing for early intervention of noncommunicable diseases, such as cancer and familial hypercholesterolemia, and use the results to recommend cascade testing of family members or refer the patient to genetic counselling. Furthermore, NPs could draw upon their clinical reasoning to create a shared management plan based on a client's diagnosis, preferences and goals. Scholars who have explored the NP role in genomics have argued that improving their genomic literacy can position NPs to better coordinate client care with the interdisciplinary team, contribute to increased access to genomic services and protect clients' ethical, legal, cultural and social interests related to genomics (Connors and Wysocki 2023; Seibert 2014). While the integration of genomics into NP practice across Canada is in its infancy, there is some evidence that it exists (Barnhardt et al. 2023; Rauw et al. 2022).

Advocacy domain

NPs work in and with diverse communities and could advocate for culturally appropriate genomic services and outreach to improve access and address the unique equity issues arising from the integration of genomics (Connors and Wysocki 2023; Limoges et al. 2024). They could advocate for policy and funding to expand access to genetic panel testing and genomic services provided within the Canadian universal healthcare system. Given the growing understanding of the equity concerns and health disparities arising from the integration of genomics (Limoges et al. 2024), NPs could advocate for specific education and practice strategies that address discrimination, support culturally safe care and enhance trust among equity-deserving communities, such as Indigenous communities, particularly concerning the ownership, collection, access and possession of data. We encourage NPs who are already champions of genomics-informed healthcare

to advocate for the inclusion of genomics in the revised NP entry-level competencies so that Canadians can benefit from these advancements through NP-led care.

Leadership domain

The public relies on NPs to provide excellent care, and NP leadership will be crucial to support the development of the nursing workforce for the genomics era (Limoges et al. 2022). In Canada, it has been challenging for nurses to integrate genomic knowledge and competencies into their practice given the limited policy, professional practice and education infrastructure (Chiu et al. 2024a, 2024b; Limoges et al. 2022; Puddester et al. 2023). As evident from the work of specialty practice groups and professional associations, nurses have a strong track record of mobilizing to advance practice through policy development, continuing professional development and advocacy. Therefore, in their leadership capacity, NPs could significantly guide the safe and equitable integration of genomics into nursing and interdisciplinary healthcare by working with professional associations, regulatory bodies, practice settings and interprofessional colleagues to develop practice standards, competencies, education frameworks and policy advocacy initiatives. These initiatives can provide important guidance to nurses in practice and also aid in clarifying nursing roles and responsibilities as part of the interdisciplinary team providing genomic health services. Within the leadership domain, NPs can also contribute to the continuous improvement of client outcomes through health systems transformation by leading the implementation of evidence-informed genomics strategies in primary, secondary and tertiary disease prevention programs. As advanced practice leaders, nurses look to NPs for mentorship. We suggest that NPs can role model being progressive, innovative and on the cutting edge of advances in genomic science and technology by recognizing the current infrastructure gaps that exist across Canada and can initiate action to build the necessary policy, education and professional practice support required for them to be full participants in the delivery of genomics-informed healthcare services.

Scholarship domain

It is crucial that nurses have evidence to guide their practice, and there is currently a significant gap in Canadian nursing research related to genomics-informed healthcare. NPs can help address this gap by leading or joining research teams, contributing to the development of clinical research questions and promoting patient-oriented research. Focusing on applied research studies (Limoges and Acorn 2016), NPs can support research that addresses practical questions and the impact of quality improvement projects designed to enhance genomics-informed practice and patient health outcomes. For example, NPs in the scholar role can help evaluate patient education, communication aids or other strategies that support patients in making informed decisions related to genetic testing.

Education domain

There is interest in pan-Canadian collaboration to offer genomics education for the nursing workforce (Chiu et al. 2024a). Some NPs may wish to specialize in genomics and, as content experts, can educate and mentor other nurses to develop their genomic literacy through preparatory and continuing education. There is significant potential for NPs to work with education programs, regulators and professional associations to seek out interprofessional and cross-sector opportunities to ensure that education programs meet the diverse needs of communities. NPs with genomics expertise can also work with clinical practice settings, professional associations and specialty practice groups to provide professional development opportunities and facilitate knowledge mobilization through various forums. Recently, Genome BC (2023) funded a novel pilot project to support the integration of genomics content into one NP program. Once evaluated, this work may provide a model for other jurisdictions to follow.

A Call to Action: Leveraging Existing Genomics Nursing Policy as an Immediate Step

While there remains much work to do to improve Canadian NPs' genomic knowledge and competencies, other jurisdictions, such as the US, have established guidance around NPs' scope of practice as it relates to genomics. For example, the *Essential Genetic and Genomic Competencies for Nurses With Graduate Degrees* developed in the US have significant overlap with the Canadian NP entry-level competencies, including risk assessment; education; counselling; interpreting results; managing ethical, legal and social implications; making referrals; engaging in health promotion; recommending preventive measures; exercising leadership; and conducting research (Greco et al. 2012). In the absence of genomic nursing policy in the Canadian context, NP leaders can draw on guidance from other jurisdictions to support the immediate integration of genomic content into nursing education and practice. Until genomics is integrated into entry-level competencies and embedded into curricula across education programs, NPs can be proactive in self-study to increase their genomic literacy. The Canadian Nursing and Genomics initiative, a group established in 2020 dedicated to developing a genomics-informed nursing workforce, recently developed a toolkit (Canadian Nursing and Genomics 2024) to support nurses to develop their genomic literacy. We suggest that this can be a useful starting point for all nurses.

Conclusion

Genomics-informed nursing practices are essential to mainstream safe and equitable genomic services across Canada. We believe that NPs can leverage their role as clinicians, advocates, leaders, scholars and educators to build the necessary infrastructure to support their full participation in interprofessional genomics-informed care. Recognizing and acting on the opportunities within the new NP

regulatory model can create the conditions required for NPs to leverage genomics in their care. With a common set of entry-level competencies designed to prepare all NPs to care for clients across the lifespan, the integration of genomics into these competencies has the potential to facilitate greater consistency across curricula, creating opportunities for all NPs to participate in genomics-informed healthcare regardless of practice setting. To realize this vision, we encourage NP leaders to engage with groups such as the Canadian Nursing and Genomics initiative to build an integrated network so that leadership and advocacy efforts across Canada can be harmonized. By working collaboratively, we can work toward a more unified approach to develop a genomics-informed NP workforce.

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Note

[1] The terms "genetics" and "genomics" are used in this article. Genomics is the more current term and pertains to the study of all of a person's genes and their interactions with the environment. In contrast, genetics is limited primarily to single-gene conditions.

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