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Nurses poised to play key role in advancing precision care through genetics and genomics

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Nurses can play a pivotal role in bringing the benefits of genomics and precision and personalized health care to fruition. To optimize nurses' impact in genetics and genomics, a concerted effort to develop infrastructure that supports genomic literacy is required.

CANADIAN NURSING & GENOMICS

Delve deep into the fascinating world of genetics and genomics by attending the upcoming workshop, ***Advancing Nursing Practice in the Genomic Era: A Canadian Initiative****. This virtual event will be of interest to nurses from all domains of practice. Expert speakers will discuss the implications of genomics to nursing practice, including parenting and child development, cancer screening and treatment, and cardiovascular risk management. Strategies to engage nursing leadership and nursing education will also be reviewed. The workshop is free and will take place on November 25, 2020, from 11 a.m. to 3 p.m. ET. Learn more about the program and register today!*

Takeaway messages

- Achieving genomic competency will enable Canadian nurses to make a significant contribution to patient health outcomes and to the field of genomics.
- Genomics is fuelled by the shift towards precision care and nurses are ideally situated to advocate for and utilize genetic testing results
- There are several actions you can take now to get started: examine your current practice and share your experiences with educators; collaborate with other health professionals and researchers; identify your learning needs; talk to your patients; consult online resources.

Advances in genetic testing and genomics* are making precision and personalized health care a reality, and nurses require support to actively participate in this rapidly developing practice area. For example, the integration of genomics has dramatically impacted our understanding of diseases such as cancer and highlighted the role of screening, environment and lifestyle on health outcomes. Nursing practice will intersect with ethical issues — such as autonomy, decision-making, privacy and discrimination — that arise with genetic testing.

Collaboration between nurses in all five domains of practice and with other health professionals will ensure that the necessary knowledge and infrastructure are developed to support safe, ethical and compassionate care. In addition, leadership and champions are needed to accelerate change and bring genomics into day-to-day practice. Achieving genomic competency will enable Canadian nurses to make a significant contribution to patient health outcomes and to the field of genomics.

Nurses have an important role in translating genomics into clinical care and population health (Dewell, Benzies, & Ginn, 2020; Leach, Tonkin, Lancastle, & Kirk, 2016). This article provides an overview of what is possible and proposes a road map to success.

Current situation in Canadian nursing

An informal scan of nursing curriculum, regulatory documents and practice standards in Canada revealed a near absence of genetics and genomics content. Similar results have been documented in other countries (Calzone et al., 2018). The good news is that our international nursing colleagues have formed organizations such as the Global Genomics Nursing Alliance (G2NA) and the International Society of Nurses in Genetics (ISONG) to support nursing initiatives that lead to genomic health care, education, research and scholarship. In Canada, an initiative supported by the Canadian Nurses Association and Ontario Genomics is underway that will engage nurses in all domains of practice to develop a framework to guide nursing strategies toward genomic literacy. This is exciting given the patient engagement in genomics and the expected contribution of nurses to advancing and supporting the use of genomics in health care.

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Genomics and the five domains of nursing practice

Point of care

The spotlight on genomics within health care is fuelled by the shift toward precision and personalized health — where one's genetic profile informs the risk of developing disease, recommended screening and prevention strategies, and treatment decisions (Leach et al., 2016). For example, if a person has Lynch syndrome (gene variants such as MSH2 or MSH6 that increase the risk of colon cancer), nurses can engage in focused health teaching to promote the patient's understanding of the risk of developing cancer and available screening and prevention options. Patients and families increasingly recognize the value of understanding their genomic profile and are highly motivated to participate in genetic testing. Nurses who have foundational knowledge in genomics can support patients after they receive results (e.g., incidental findings from genome sequencing), helping them interpret the findings and make decisions (Mighton et al., 2019).

Given the nature of nursing practice in direct clinical care and in public health, nurses are ideally situated to advocate for and use genetic testing results. For example, nurses who collect and interpret personal and family health histories can identify high-risk individuals and groups who should be offered genetic screening. Collaborating with genetic services can help ensure that pretest counselling and formal risk assessments are conducted. Nurses are involved in patient and family education that can be individualized to genetic risks and administer prescribed treatments based on precision medicine. Additionally, nurses can advocate for and participate in health-system planning that includes programs related to disease prevention and health promotion based on genetic findings.

Policy

Advocacy is a central pillar of the nursing profession. Nurses are well positioned to advocate for equitable access to genetic testing. This advocacy work can occur at the patient or community level and involves shaping health policy, including determining criteria for testing and developing public awareness campaigns. Policy is also needed to outline minimum competencies for both entry-to-practice and practising nurses related to genetics and genomics. Policy and advocacy will support nurses to engage in interprofessional research in the field of genomics, as well as collaborate with organizations such as Genome Canada and the various provincial genomic organizations (Ontario Genomics, for example).

Nurses are ideally situated to advocate for and use genetic testing results.

Administration

Administrators and champions are needed to forge collaboration across the domains of nursing practice and to drive innovations arising from the growing genomic literacy within nursing. Leaders can collaborate with key stakeholders (i.e. academic institutions, regulatory organizations and clinicians with expertise in genomics) to explore opportunities and carve out new roles for nursing practice within genomics. Leaders can support staff development, health-system transformation and the active engagement of nurses in precision and personalized health care.

Education

In the academic setting, nursing faculty have an opportunity to develop curricula that include stand-alone mandatory courses in genomic health, as well as threading genomics into the broader curriculum to ensure that students gain experience with applying this knowledge (Daack-Hirsch, Dieter, & Quinn Griffin, 2011). Faculty who have the necessary expertise and training to develop curricula in both undergraduate and graduate nursing programs are needed (Daack-Hirsch et al., 2011). Faculty members can collaborate with institutional and community partners to champion clinical placements with a genetics and genomics focus, as well as create global opportunities for students to participate in research and policy development in this area (Calzone, Jenkins, Culp, & Badzek, 2017). Additionally, interprofessional learning opportunities, such as collaborative partnerships between nursing and colleagues in the medical genetics field and genetic counsellors, can be fostered as part of clinical education. The evidence supports the need for early integration of genomics within nursing academic programs, with ongoing professional development opportunities within the workplace (Calzone et al., 2018).

Research

Research can generate knowledge that supports the application of genetics and genomics in nursing practice, health system transformation and health policy. For instance, it's critical that we learn how individuals experience and use the genetic results. The findings from such nursing research can guide precision health strategies, including how genetic findings and genomics impact quality of life, health promotion strategies, screening recommendations and health teaching. Additionally, interprofessional research collaborations in genetics and genomics will foster key partnerships and create shared knowledge that will ultimately support patient-centred care.

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Next steps for Canadian nurses

Nursing colleagues in the United Kingdom (U.K.), the United States (U.S.) and beyond have taken the lead on developing strategies and international efforts to support nurses to integrate genetics and genomics into nursing practice (Calzone et al., 2017, 2018). Their efforts can assist in advancing nursing genomic literacy in Canada. Interventional studies in the U.K. and the U.S. have examined strategies aimed at increasing awareness of genomics and competence among practising nurses (Calzone et al., 2018; Leach et al., 2016). These initiatives highlight the critical need for nursing leadership and expertise in this content area, as well as for organizational infrastructure to support ongoing access to educational resources and mentorship (Calzone et al., 2018; Leach et al., 2016; Tully, Calzone, & Cashion, 2020). Alongside this research, G2NA and ISONG provide access to a global network of nurse leaders in the area of genetics and genomics, practical resources and support (Tonkin et al., 2020). A road map to support a coordinated effort toward genomic literacy can guide the Canadian initiative.

How can you get involved?

A coordinated and collaborative approach will achieve optimal involvement by nurses in genomics (Calzone et al., 2017; Daack-Hirsch et al, 2011; Leach et al., 2016). Building on existing Canadian initiatives to strengthen intraprofessional collaboration (Lankshear & Limoges, 2019), nurses in the five domains of practice are poised to advance genetics and genomics.

Nursing faculty have an opportunity to develop curricula that include stand-alone mandatory courses in genomic health.

Take action

- Participate in the development of the national framework for nursing genomic literacy.
- Document examples of your nursing practice that include genomics and share these with faculty and clinical educators so that they can be used for teaching purposes.
- Reach out to other nurses and/or health professionals to collaborate in genomic research or personalized and precision health care or to start a conversation on how your practice could be enhanced by genomics.
- Identify your learning needs related to genomics and communicate these to your clinical educator.
- If you have knowledge in genomics, offer to provide an in-service to your colleagues.
- Talk to your patients about their experiences and care needs arising from genetic testing.
- Email the authors of this paper to exchange ideas.

Learn more

For nurses interested in learning more about genetics and genomics, there are several resources to consider:

- The American Nursing Association offers "A Resource Guide for Learning about Genetics" (Maradiegue, 2008) and "Basic Genetics and Genomics: A Primer for Nurses" (Lea, 2009).
- The ISONG website lists different credible resources, including toolkits, web-based educational modules and certification opportunities (International Society of Nurses in Genetics, n.d.).
- The National Human Genome Research Institute website lists different verified resources targeting health-care providers (National Human Genome Research Institute, 2019).

The findings from nursing research can guide precision health strategies.

Conclusion

Nurses can play a pivotal role in bringing the benefits of genomics and precision and personalized health care to fruition. To optimize nurses' impact in genetics and genomics, a concerted effort to develop infrastructure that supports genomic literacy is required. Specifically, given the rapid uptake of genetics and genomics in clinical care, additional nursing knowledge and skills are required to support patients in their health-related decisions, optimize patient care and contribute to interprofessional care. Collaboration between nurses in point of care, policy, administration, education and research — and with other health professionals — will ensure that nurses develop competencies, knowledge and clinical skills in genetics and genomics.

**__Genetic testing__ is a broad area of study that encompasses a myriad of technologies that test for changes in chromosomes, genes and proteins. The purpose of such testing is to confirm (or eliminate) a diagnosis or determine risk of developing a clinical condition. __Genomics__ is an interdisciplinary field of study, focusing on genome sequencing and analysis.*

References

Calzone, K. A., Jenkins, J., Culp, S., & Badzek, L. (2017). Hospital nursing leadership-led interventions increased genomic awareness and education intent in Magnet settings. *Nursing Outlook*, *66*(3), P244-P253. doi:10.1016/j.outlook.2017.10.010

Calzone, K. A., Kirk, M., Tonkin, E., Badzek, L., Benjamin, C., & Middleton, A. (2018). The global landscape of nursing and genomics. *Journal of Nursing Scholarship, 50*(3), 249-256. doi:10.1111/jnu.12380

Daack-Hirsch, S., Dieter, C., & Quinn Griffin, M. (2011). Integrating genomics into undergraduate nursing education. *Journal of Nursing Scholarship, 43*, 223-230. doi:10.111/j.15475069.2011.01400.x

Dewell, S., Benzies, K., & Ginn, C. (2020). Precision health and nursing: Seeing the familiar in the foreign. *Canadian Journal of Nursing Research, 52*(3), 199-208. doi:10.1177/0844562120945159

International Society of Nurses in Genetics. (n.d.). *ISONG educational resources*. Retrieved from https://www.isong.org/page-1325075

Lankshear, S., & Limoges, J. (2019, May 6). Intra-professional collaboration: Timing is everything. *Canadian Nurse.* https://www.canadian-nurse.com/en/issues/2019/may-2019/intra-professional-collaboration-timing-is-everything

Lea, D. H., (2009). Basic genetics and genomics: A primer for nurses. OJIN: The Online Journal of Issues in Nursing, *14*(2). https://ojin.nursingworld.org

Leach, V., Tonkin, E., Lancastle, D., & Kirk, M. (2016). A strategy for implementing genomics into nursing practice informed by three behaviour change theories. *International Journal of Nursing Practice, 22*(3), 307-315. doi:10.111.ijn.12431

Maradiegue, A. (2008). A resource guide for learning about genetics. OJIN: The Online Journal of Issues in Nursing, *13*(1). http://ojin.nursingworld.org

Mighton, C., Carlsson, L., Clausen, M., Casalino, S., Shickh, S., … Bombard, Y. (2019). Development of patient "profiles" to tailor counseling for incidental genomic sequencing results. *European Journal of Human Genetics, 27*, 1008-1017.

National Human Genome Research Institute. (2019, October 9). *Provider genomics education resources*. Retrieved from https://www.genome.gov/For-Health-Professionals/Provider-Genomics-Education-Resources

Tonkin, E., Calzone, K. A., Badzek, L., Benjamin, C., Middleton, A., Patch, C., & Kirk, M. (2020). A roadmap for global acceleration of genomics integration across nursing. *Journal of Nursing Scholarship, 52*(3), 329-338. doi:10.1111/jnu.12552

Tully, L. A., Calzone, K. A., & Cashion, A. K. (2020). Establishing the Omics Nursing Science & Education Network. *Journal of Nursing Scholarship, 52*(2), 192-200. doi:10.1111/jnu.12541

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https://canadian-nurse.com/en/articles/issues/2020/october-2020/nurses-poised-to-play-key-role-in-advancing-precision-care-through-genetics-and-genomics