Artificial Intelligence and Nursing In Canadian Healthcare: Enhancing Care, Not Replacing It

Artificial Intelligence (AI) has transitioned from a theoretical-futuristic concept to a practical technology in modern Canadian healthcare delivery. From predictive analytics to virtual assistants and workflow automation, AI has the potential to transform how care is delivered, how nurses work, and how patients experience the healthcare system. However, the extent to which AI enhances nursing practice may be the most critical determinant of its successful implementation across hospital and long-term care facilities in Canada.

Nursing has always been a profession at the intersection of science, technology, and human compassion. Over the last century, Canadian nurses adapted to everything from digital intravenous pumps to Electronic Medical Records (EMRs). Each technological advancement required learning new tools and competencies, often without decreasing the underlying demands of patient care. Unlike earlier technologies that increased administrative burden, AI has the potential to automate routine workflows and reduce both cognitive load and time demands on nursing professionals. Studies have shown that clinicians spend a significant portion of their working hours on documentation, time that could be returned to direct patient care through AI enabled technology [1].

Some early real-world case studies illustrate this shift to AI adoption in healthcare. In Canada, several health authorities and academic hospitals have piloted AI-supported triage and patient monitoring initiatives to improve emergency department flow, resource utilization, and patient outcomes [2]. These initiatives reinforce a key lesson: AI is most effective when it augments clinical judgment rather than replaces it.

Canadian hospitals have also begun exploring AI-powered virtual assistants to answer common patient questions, helping to reduce interruptions for nursing staff while improving patient experience and satisfaction [3]. Other organizations are piloting natural-language interfaces connected to nurse call systems, with early indicators pointing to faster response times, reduced alarm fatigue, and measurable improvements in patient-reported experience measures (PREMs).

Layering Intelligence and Automation on Top of a Life Safety Backbone

While AI has the potential to influence many aspects of care, it is important to recognize that it will not replace essential life-saving systems. Nurse call systems remain the foundational communication and alerting backbone between patients and care teams. Rather than being displaced by AI, modern nurse call platforms stand to benefit from enhanced automated alerting, intelligent prioritization, and decision-support capabilities layered on top of proven, code-compliant infrastructure.

AI inherently requires internet connection servers to function which are not guaranteed to be available 100% of the time. In contrast, as a hardened life-safety system, nurse call's core life-safety and alerting functionality must be available 24/7 without relying on servers, networks, and the internet. In emergencies, nurse call ensures rapid mobilization with a single button press that immediately alerts multiple caregivers or teams (e.g., a Code Blue), ensuring a fail-safe escalation pathway.

Future AI nurse call-related applications could include Natural Language Processing, Event-Driven Automation, and Operational Automation

Natural Language Processing (NLP):

For patients and families, AI-enabled natural language processing can simplify how assistance is requested.

For patients and families: A patient in bed, or a family member at the bedside, can verbally request assistance in any language, "I'm in pain," or "I need to go to the bathroom." Through the nurse call system, the request automatically appears on the dome light outside the patient's room and routes to the right caregiver who can then reassure the patient directly through the nurse call intercom that help is on the way.

For caregivers: Staff can verbally request help, "I need assistance" which triggers an alert on the dome light and notifies the appropriate responder or initiate predefined workflows through the nurse call platform. AI technologies, similar in concept to large language models, can interpret spoken or text-based requests and convert them into structured, actionable tasks while maintaining data governance and privacy standards appropriate for Canadian healthcare.

Event-Driven Automation:

Where AI-enabled cameras with facial recognition, motion detection, and gesture recognition are utilized to identify patients, staff and visitors. Some application examples include;

- ***Nurse call 'bed exit' alarms if a patient attempts to get out of bed.***
- ***Fall alerts through the nurse call if a patient fall is detected in the patient room, bathroom, or hallway.***
- ***Without having to manually press a button, distress recognition through facial expression, motion, or agitation can automatically alert caregivers through the nurse call.***
- ***By staff simply walking into a patient room and interacting with the patient, patient rounding is acknowledged and logged automatically in the EMR for safety and satisfaction tracking.***

Operational Automation:

Utilizing AI to analyze historical and current data to project future needs and at what point to escalate an event. For example:

- ***Staffing needs can be forecasted by analyzing historical and trending nurse call volume, response times, and environmental factors (e.g., flu season).***
- ***Based on historical response time correlated to patient satisfaction and safety, AI determines at what point to escalate a patient request on the nurse call system that has been waiting too long.***

Conclusion

The promise of AI is especially compelling for patient-centered care. The opportunity is clear; advanced nurse call systems with AI can enable more efficient workflow, faster response times and reduced alarm fatigue, while also improving patient satisfaction, reducing falls, enhancing staff safety, and driving better overall outcomes. Patients will feel seen and supported not just by technology, but by nurses who are empowered with more time and better tools to deliver compassionate, human-centred care.

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Adapted for Canadian readers; core content and insights remain the author's original work.

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