McMaster University | Health Forum

Rapid evidence synthesis

Artificial intelligence tools for reducing administrative burden among front-line healthcare providers

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Context

Administrative burden among front-line healthcare providers has reached critical levels, significantly impacting healthcare delivery, provider well-being, and patient care quality.(1) Some estimates suggest healthcare providers spend up to 50% of their time on documentation and administrative tasks, often extending work into personal hours and contributing to widespread burnout.(2)

In Canada, the situation is particularly concerning. The 2025 National Physician Health Survey (NPHS) found that 46% of physicians are burned out, with excessive administrative workload being a major contributing factor.(3) Canadian physicians and residents work an average of 53 hours per week, with 10 hours dedicated to administrative tasks alone, equivalent to more than a full extra workday. These numbers have remained unchanged since the 2021 NPHS, indicating persistent administrative burden. Additionally, 64% of physicians reported spending an excessive or moderately high amount of time on electronic medical records outside regular working hours, representing an increase from 49% in 2021.(3) The COVID-19 pandemic has further exacerbated these challenges, with healthcare workers facing unprecedented demands while managing increased documentation requirements, patient scheduling complexities, and communication needs.(4) This administrative burden reduces time available for direct patient care, contributes to provider dissatisfaction and early retirement, and exacerbates existing healthcare workforce shortages.(5; 6)

Box 1: Evidence and other types of information

+ Global evidence drawn upon

Evidence syntheses selected based on relevance, quality, and recency of search

- No forms of domestic evidence used

+ Other types of information used

Jurisdictional scan (eight countries: AU, CA, DE, FI, IS, NO, NZ, SE)

*** Additional notable features**

Prepared in 30 business days using an 'all hands on deck' approach

Artificial intelligence (AI) tools have emerged as a promising solution to address these challenges by automating routine administrative tasks and streamlining healthcare workflows. AI applications in healthcare administration include patient scheduling and triage supports, digital scribes and documentation systems, communication assistance platforms, and discharge support systems. These technologies utilize natural language processing, machine learning, automatic speech recognition, and predictive analytics to reduce manual workload and improve operational efficiency.(7; 8)

Early experiences with implementing these solutions demonstrate significant potential, with time savings, improved documentation quality, enhanced workflow efficiency, and positive impacts on provider satisfaction all reported.(9) However, questions remain about optimal implementation strategies, effectiveness across different healthcare settings, long-term sustainability, and impacts on the quadruple aim of healthcare improvement.(10) Understanding barriers to AI tool adoption is equally critical, as successful implementation requires addressing technical, organizational, provider-level, and patient-level challenges.(8)

However, the evidence base supporting AI administrative tools remains limited. As Terry et al. (2025) recently noted, "the evidence base is still limited" for AI administrative task tools in primary care, with practitioners needing to "demand both proper real-world testing and rigorous evaluation" of these technologies. This highlights the critical need for comprehensive evidence synthesis to inform implementation decisions.(11)

The objective of this rapid evidence synthesis is to examine the available evidence on the effectiveness of AI tools for reducing administrative burden among front-line healthcare providers. We aim to evaluate various AI tools and applications across different healthcare settings, assess their impacts on provider experience and other equity-centred quadruple-aim metrics (i.e., patient care experiences, health outcomes, and costs), and identify key barriers and facilitators for successful implementation. Our findings will inform evidence-based decision-making regarding AI tool adoption and support healthcare organizations in developing strategies to leverage AI technologies for administrative burden reduction while maintaining high-quality patient care. This synthesis addresses the call for more rigorous evaluation of AI administrative tools by reviewing available evidence and identifying gaps that require further research.

Questions

This rapid evidence synthesis addressed three main questions:

1) What is known about the effectiveness of AI tools for reducing administrative burden among front-line healthcare providers (including physicians and non-physician providers), how does this vary across tools, disciplines/clinical environments and contexts, and what are the impacts on provider experiences and other equity-centred quadruple-aim metrics (i.e., improving care experiences and health outcomes at manageable per capita costs)?
2) What is known about potential barriers to and challenges with adopting AI tools among front-line healthcare providers?
3) What AI tools have been used in health systems in Canada and in select international jurisdictions (i.e., Australia, Denmark, Finland, Iceland, New Zealand, Norway, Sweden, the United Kingdon (U.K.), and the United States

Box 2: Approach and supporting materials

We identified evidence addressing the question by searching PubMed, Health Systems Evidence, and HealthEvidence.org to identify evidence syntheses, protocols for evidence syntheses, and primary studies. We limited the search date between 1 January 2017 and 22 April 2025. The search strategies used are included in Appendix 1.

We identified jurisdictional experiences by hand searching government and stakeholder websites for information relevant to the question from nine countries, including: Australia, Denmark, Finland, Iceland, New Zealand, Norway, Sweden, United Kingdon, and United States.

In contrast to our rapid evidence profiles, which provides an overview and insights from relevant documents, this rapid evidence synthesis provides an in-depth understanding of the evidence.

We appraised the methodological quality of evidence syntheses that were deemed to be highly relevant using the first version of the AMSTAR tool. AMSTAR rates overall quality on a scale of 0 to 11, where 11/11 represents a review of the highest quality, medium-quality evidence syntheses are those with scores between four and seven, and low-quality evidence syntheses are those with scores less than four. The AMSTAR tool was developed to assess reviews focused on clinical interventions, so not all criteria apply to evidence syntheses pertaining to delivery, financial, or governance arrangements within health systems or implementation strategies.

This rapid evidence synthesis was prepared in a 30-business-day timeline.

A separate appendix document includes:
1) methodological details (Appendix 1)
2) a summary table of evidence synthesis (Appendix 2)
3) a summary table of single studies (Appendix 3)
4) findings from a jurisdictional scan of Canadian provincial and territorial experiences (Appendix 4)
5) findings from a jurisdictional scan of international experiences (Appendix 5)
6) documents excluded at the final stage of reviewing (Appendix 6)
7) PRISMA diagram (Appendix 7).

(U.S.)) to reduce administrative burden among front-line healthcare providers, and what has been learned about their adoption and impact?

This rapid evidence synthesis also sought to identify and document whether recommendations have been made related to the adoption and use of any specific AI tools for reducing administrative burden among front-line healthcare providers (including whether these recommendations were developed following a robust process such as GRADE).

High-level summary of key findings

Evidence identified

We identified 1,035 records and after undertaking eligibility assessments, included 51 evidence documents, of which we deemed 45 to be highly relevant and six of medium relevance. Only the high-relevance studies were included in the report, and the medium- relevance studies can be found in the appendices.

The highly relevant evidence documents include:

- 17 evidence syntheses (which included systematic reviews and scoping reviews)
- 28 single studies (which included randomized controlled trials, pilot studies, and qualitative studies).

Key findings from evidence documents in relation to the research question

- AI tools demonstrate substantial administrative burden reduction across multiple healthcare domains.
  - Digital scribes and documentation tools showed the most robust evidence for reducing administrative burden:
    - time savings ranged from 20.4% reduction in note-writing time per appointment to 30.0% decrease in after-hours work
    - widespread implementation demonstrated median daily documentation time reduction of 6.89 minutes and total daily electronic health record (EHR) time savings of 19.95 minutes, equivalent to approximately 83 hours annually per physician, helping address physician burnout from documentation burden
    - AI integration can automate up to 30% of nursing administrative tasks through intelligent documentation systems, automated scheduling, and streamlined billing processes.
- Documentation quality improvements were consistently demonstrated alongside time savings:
  - 70% of AI-assisted letters and 100% of AI-assisted notes scored above quality thresholds compared to 29% and 43%, respectively, with standard EHR systems.
    - Speech recognition accuracy improved progressively from 86.80% to 94.57% across multiple sessions.
  - Clinicians reported 6.91 times higher odds of finding documentation workflows easy and 4.95 times higher odds of completing notes before next patient visits.
- Communication support systems enhance patient-clinician interactions.
  - AI-enabled communication tools improved various aspects of clinical communication:
    - an emergency department AI symptom-taking tool used by patients collected medical history and symptoms in the waiting room and generated structured handover reports for clinicians facilitated conversation according to 75% of patients, 73% of physicians, and 100% of nurses
    - AI-supported behavioural interventions achieved superior clinical outcomes with 34% depression symptom reduction versus 20% with standard care.
- Patient discharge support systems show early promise.
  - Limited evidence suggests potential for improving discharge documentation efficiency:
    - AI-generated discharge summaries achieved comparable quality scores compared to physician-generated reports
    - AI-generated informed consent forms were significantly more readable while maintaining clinical accuracy.
- AI diagnostic and decision-support tools may also contribute to outcomes associated with reducing administrative burden.

  - AI-powered clinical decision support systems improve diagnostic accuracy, early disease detection, and error reduction while streamlining administrative tasks and optimizing workflows across healthcare settings, with particular promise in emergency medicine.
  - Large language models enhance interdisciplinary understanding of complex clinical notes and improve diagnostic comprehension among non-specialist clinicians, serving as augmentation tools that enhance rather than replace clinical judgment.
- Significant barriers exist across multiple levels that must be addressed for successful implementation.
  - System-level barriers included data quality concerns, accuracy limitations, and potential biases affecting underrepresented populations in training datasets.
  - Organizational barriers centred on technical integration difficulties with existing EHR systems, substantial training requirements, and funding constraints.
  - Provider-level barriers encompassed concerns about reduced patient empathy, fear of AI replacement, loss of clinical autonomy, and insufficient AI experience.
  - Patient-level barriers related to safety concerns from AI biases and lack of patient-specific context in AI-generated care.
- Facilitators for successful AI tool adoption are well-defined.
  - Strong organizational leadership, management support, and interdisciplinary collaboration between healthcare providers, policymakers, and AI companies emerged as essential facilitators.
  - Investment in comprehensive AI training sessions and programs significantly increased tool adoption rates.
  - Including healthcare providers in AI tool development processes enhanced clinical functionality and increased willingness to use tools.
  - Increased exposure to AI tools reduced provider hesitation and improved acceptance in clinical practice.

Key Findings from jurisdictional scans documents in relation to the research question

- AI scribing and documentation tools have shown promise for reducing administrative burden in Canada and internationally.
  - Most documented effectiveness comes from pilot projects rather than sustained implementation.
  - Canadian provinces demonstrated substantial time savings: BC achieved 2.7–5.7 hours per week reduction in administrative tasks and Ontario reported 70% reduction in documentation time saving up to four hours weekly.
  - There were high satisfaction rates, with 97% of BC clinicians recommending AI scribes and 78% of patients feeling they received increased physician attention.
  - International evidence supports findings: Finland projects 30% savings in nurses' working hours and Denmark achieved 25% staff workload reduction.
- Patient scheduling and triage support has been used in several jurisdictions in Canada to improve accuracy, discharge capacity, scheduling time, and nurse assignment time.
  - Fraser Health Authority's AI discharge prediction tool achieved 86% accuracy (four times better than human predictions), potentially tripling daily discharge capacity from 250–300 to 600 patients.
  - Quebec's CHUM reduced radiologist appointment scheduling time by half, freeing 11 additional treatment hours daily.
  - Unity Health Toronto reduced nurse assignment time from three hours to 15 minutes per shift.
- Communication and documentation support has been used in some Canadian jurisdictions, showing promise for improving cost savings, and supporting both administrative and clinical tasks.
  - Quebec's AI surgical instrument tracking achieved 24.5% cost reduction with $4.5–8.4 million potential annual savings.
  - Newfoundland and Labrador supported an AI platform for medical document sorting and claim complexity prediction.
  - Northwest Territories implemented AI for automated polyp detection, reducing manual interpretation tasks.
- Facilitators to overcome barriers and challenges to AI tool adoption were found in Canada and internationally.

    - Multiple Canadian provinces established comprehensive resources to help facilitate the adoption of AI tools, including BC's Doctors policy statements, Alberta's Medical Association principles, and Ontario's AI Knowledge Zone.
    - Canada Health Infoway developed implementation and procurement toolkits for regulatory compliance.
    - International jurisdictions mirror these approaches, including Australia's multi-association statements, Denmark's specialized AI centres, and Norway's cross-agency initiatives.
- Implementation support and funding challenges were also identified.
    - Most documented effectiveness comes from pilot projects rather than sustained implementation.
    - There is a need for comprehensive long-term evaluation of health outcomes, cost-effectiveness, and equity impacts across diverse settings.
    - Despite substantial provincial investments, scaling from pilot to system-wide implementation remains a challenge, requiring sustained evaluation studies.
- The evidence included predominantly emerged from academic and research-oriented care settings, with a notable absence of studies conducted in rural or remote communities, representing a significant gap in the literature.

Framework to organize what we looked for

- Types of AI tools for reducing administrative burden
    - Patient-scheduling and triage supports
    - Scribing and documentation tools
    - Communication supports
    - Prior authorization supports
    - Patient-discharge supports
- Sectors
    - Home and community care
    - Primary care
    - Specialty care
        - Emergency care
        - Outpatient specialty care
        - Inpatient specialty care
    - Rehabilitation care
    - Long-term care
    - Public health
- Healthcare providers
    - Physicians
        - Generalists
        - Specialists
    - Nurses
    - Pharmacists
    - Allied health professionals
- Settings
    - Rural/remote communities (vs. urban communities)
    - Academic- or research-oriented care settings (vs. community settings)
- Outcomes
    - Provider experiences
        - Time spent on administrative tasks (e.g., documentation)
        - Time available for patient care
        - Physician wellness or retention
- Accuracy of outputs
    - Other equity-centred quadruple aim metrics

    - Patient experience
    - Health outcomes
    - Costs
- Barriers to adoption and scaling up
    - System-level barriers
    - Organizational-level barriers
    - Provider-level barriers
    - Patient-level barriers
- Facilitators of adoption and scaling up
    - System-level facilitators
    - Organizational-level facilitators
    - Provider-level facilitators
    - Patient-level facilitators

What we found

We identified 51 evidence documents relevant to the question, of which we deemed 45 to be highly relevant and seven of medium relevance. Only the high-relevance studies were included in the report, and the medium- relevance studies can be found in the appendices.

The highly relevant evidence documents include:

- 17 evidence synthesis (e.g., systematic reviews and scoping reviews)
- 28 single studies (e.g., randomized controlled trials, pilot studies, and qualitative studies).

Key findings from highly relevant evidence sources

Q1: What is known about the effectiveness of AI tools for reducing administrative burden among front-line healthcare providers, how does this vary across different contexts, and what are the impacts on provider experiences and patient care outcomes?

We outline in narrative form below our key findings related to the questions from highly relevant evidence documents in four domains: patient scheduling and triage supports, scribing and documentation tools, communication supports, and patient discharge supports. These studies were conducted across diverse healthcare sectors, such as outpatient specialty care encompassing subspecialties including dermatology, ophthalmology, plastic surgery, and mental health services; emergency care settings focusing on triage optimization and clinical decision support; inpatient specialty care examining intensive care and hospital-based applications; and nursing environments addressing workflow optimization and clinical documentation. The evidence predominantly emerged from academic and research-oriented care settings, with a notable absence of studies conducted in rural or remote communities, representing a significant gap in the literature. Studies encompassed diverse provider types including physicians, clinical specialists, nursing staff, and multidisciplinary healthcare teams across Canadian healthcare settings with supplementary international evidence.

Patient-scheduling and triage support systems

A few evidence syntheses demonstrate that artificial intelligence applications in patient scheduling and triage support systems show significant potential for improving emergency department operations and patient flow management. AI exhibits considerable promise in emergency patient triage, particularly in optimizing resource allocation and reducing both undertriage and overtriage, while enhancing emergency department flow and patient outcomes, though evidence for completely substituting human involvement has not yet been established.(12) AI-applied triage systems play a crucial role in patient classification, especially in settings where triage experience or workforce capacity is limited.(12) In patient flow applications, AI demonstrates capability to improve patient flow by streamlining administrative tasks and optimizing

resource allocation, with measurable outcomes including reductions in length of stay and risk of readmission, though predictive variables for these outcomes remain inconsistent across studies.(13) Large language models have shown potential to transform emergency medicine through four major application areas: clinical decision-making and support, efficiency and workflow management, risk management and ethics, and education and communication, with particular emphasis on enhancing decision-making, optimizing workflows, and improving patient outcomes.(9) Additionally, AI integration has demonstrated improvements in operational efficiency by shortening consultation and treatment wait times, increasing diagnosis speed and accuracy, and facilitating clinical decision-making processes.(7) The technology further supports healthcare management through enhanced resource management, risk assessment, and decision-making capabilities, while optimizing administrative tasks and improving overall workflow efficiency.(14; 15)

However, single studies in this domain are limited, with only one investigation specifically examining AI applications for patient scheduling and triage support. Li et al. (2022) conducted a randomized clinical trial using artificial intelligence to reduce queuing time and improve satisfaction in pediatric outpatient services, reporting remarkable improvements across multiple operational metrics.(16) The AI-assisted group achieved significantly shorter median queuing times of 8.78 minutes (IQR 3.97, 33.88) compared to 21.81 minutes (IQR 6.66, 73.10) in the conventional group, representing a 60% reduction in patient waiting time. Additionally, the AI system reduced pre-consultation processing time, defined as the time required for initial assessment and test ordering, reduced from 2.68 minutes (IQR 1.82, 3.80) in the conventional group to just 0.35 minutes (IQR 0.18, 0.99) in the AI-assisted group. This dramatic reduction reflects the AI system's ability to rapidly process patient information and recommend appropriate diagnostic tests before the actual physician consultation, rather than representing the duration of doctor-patient interaction. Total service time decreased from 110.40 minutes to 40.20 minutes, indicating comprehensive workflow optimization. Patient satisfaction increased by 17.53% in the AI-assisted group, with the AI system also demonstrating cost-effectiveness through reduced unnecessary tests and examinations. However, it's important to note that while this study demonstrated significant efficiency gains, it did not specifically report on diagnostic accuracy or safety outcomes related to AI-assisted triage decisions, representing a gap in current evidence regarding the clinical reliability of AI systems in pediatric outpatient settings.

Scribing and documentation tools

Multiple evidence syntheses demonstrate that artificial intelligence-powered scribing and documentation tools show promising but variable results across clinical settings. An evidence synthesis shows AI tools can improve clinical documentation by structuring data, annotating notes, evaluating quality, identifying trends, and detecting errors, though highly accurate end-to-end AI documentation assistants remain unavailable due to moderately high error rates.(17) Digital scribes utilizing context-sensitive word embeddings and attention-based neural networks represent the most promising technological approaches, yet most studies remain in early phases lacking comprehensive evaluation of clinical validity, usability, and utility.(18) Large language models have shown potential for enhancing healthcare delivery through assistance with documentation, surgical planning, and administrative tasks in both clinical and surgical settings.(19) Machine learning applications to administrative tasks in general practice demonstrate under-researched potential for automation, though there is a lack of open-source data and prioritization of diagnostic tasks over administrative support functions.(20) A scoping review by Lee et al. (2024) reported significant improvements in clinical documentation efficiency, with AI tools reducing clinician workload and allowing more time for patient care.(21) A 2023 literature review indicated that AI tools can be used to support supportive and palliative care (SPC) clinicians in decision-making and reduce manual workload, leading to potentially improved care and outcomes for cancer patients.(22)

Single studies provide additional evidence supporting these evidence synthesis findings, with AI scribes and ambient scribing technologies demonstrating the most consistent evidence for reducing administrative burden across multiple healthcare settings. The most significant time savings were reported by Duggan et al. (2025), who found a 20.4% reduction in time spent on notes per appointment (from 10.3 to 8.2 minutes), a 30.0% decrease in after-hours work time per day (from 50.6 to 35.4 minutes per day), and a 9.3% increase in same-day appointment closure rates (from 66.2% to 72.4%), indicating improved clinician ability to complete all visit documentation and administrative tasks within the same workday rather than requiring after-hours completion.(23) Ma et al. (2025) demonstrated widespread adoption with

55.25% utilization across encounters, resulting in median daily documentation time reduction of 6.89 minutes, after-hours EHR time reduction of 5.17 minutes per day, and total daily EHR time savings of 19.95 minutes.(24) Albrecht et al. (2025) provided evidence for AI documentation benefits, reporting 6.91 times higher odds of finding documentation workflow easy (95% CI: 3.90–12.56) and 4.95 times higher odds of completing notes before the next patient visit (95% CI: 2.87–8.69), with 77% of clinicians reporting decreased documentation burden and 73% experiencing reduced after-hours work.(25) Cao et al. (2024) found that AI-driven digital scribes reduced dermatologists' daily EHR time from 90.1 to 70.3 minutes while increasing note length by 30–50 words and decreasing clinician note contribution by nearly half.(6)

Documentation quality improvements were consistently demonstrated, with Balloch et al. (2024) showing 70% of AI-assisted letters and 100% of notes scoring above 25 on SAIL quality measures compared to 29% and 43%, respectively, with standard EHR systems, alongside 26.3% shorter consultation times.(5) Liu et al. (2024) conducted a nonrandomized clinical trial evaluating AI-powered clinical documentation, demonstrating significant improvements in clinicians' EHR experiences and time efficiency through systematic implementation of AI documentation tools.(26) Speech recognition technologies showed progressive accuracy improvements, with Lee et al. (2023) reporting nursing documentation accuracy increasing from 86.80% to 94.57% across four sessions,(27) while Langdon et al. (2025) achieved 96.50% BERTScore, a metric evaluating semantic similarity between AI-generated and reference text using contextual embeddings, for pediatric ear, nose, and throat (ENT) documentation with 4.64/5 clinician satisfaction on speech recognition technology (Speaknosis).(28) Peine et al. (2023) conducted a crossover study comparing voice-based information and documentation systems in intensive care, finding statistically significant advantages over traditional patient data management systems (PDMS) and paper documentation in terms of performance (Cohen d = 1.61), accuracy, and user experience, with tasks completed significantly faster using voice-based systems.(29) Clinician well-being outcomes showed remarkable improvements, as Shah et al. (2024) reported significant reductions in physician task load (–24.42) and burnout (–1.94), with usability improvements (+10.9) and perceived time savings of 20 minutes per half-day clinic.(30) However, implementation challenges were noted by Afshar et al. (2024), who reported initial documentation accuracy decreases from 79% to 35% due to workflow integration issues before returning to baseline levels after targeted interventions.(31)

Communication support systems

Multiple evidence syntheses demonstrate that artificial intelligence-powered communication support systems – digital tools that use AI to facilitate, enhance, or optimize information exchange between patients and healthcare providers – show promising but varied results across clinical settings, with particular strength in language translation and patient education applications. AI medical translation systems show promise for brief communications but often require human intervention for accuracy and acceptability, with accuracy scores varying significantly depending on translation direction and achieving higher accuracy when translating from English, though AI serves primarily as a supplementary tool when human translators are unavailable rather than a replacement for human translation.(32) Large language models have demonstrated potential for transforming emergency medicine through four major application themes, including education and communication, by enhancing decision-making, optimizing workflows, and improving patient outcomes.(9) In nursing management contexts, AI technologies enhance communication optimization alongside resource management, risk assessment, and decision-making, supporting nurse managers in leading changes and optimizing administrative tasks with measurable outcomes including leadership enhancement and communication optimization.(14) Automatic speech recognition systems with natural language processing capabilities have emerged as key components for documenting professional health interactions, though challenges remain in recognizing complex medical terminology and adapting to different languages or accents.(33) The successful adoption of AI-driven communication systems requires ongoing investment in AI education, ethical frameworks, and infrastructure development, with outcomes demonstrating improvements in patient care, nursing efficiency, workflow optimization, and AI-driven education initiatives.(15)

Individual studies provide additional evidence supporting these systematic findings, with AI-enabled communication support tools demonstrating significant improvements in patient-clinician interactions, rapport building, and therapeutic engagement across diverse healthcare settings. The most compelling evidence came from Scheder-Bieschin et al.

(2022),(34) who evaluated a patient-facing AI symptom-taking tool used in emergency department waiting rooms, where patients independently completed a digital assessment on tablet computers that collected demographic information, medical history, and symptoms using Bayesian probabilistic reasoning with an adaptive question flow. The system generated detailed handover reports that were automatically made available to physicians and nurses through a secure web-interface dashboard. The study found that an AI symptom-taking tool in emergency departments facilitated conversation according to 75% of patients, 73% of physicians, and 100% of nurses, with high usability scores (84% of patients) and comprehension rates (86% of patients), while 78% of patients, 53% of physicians, and 76% of nurses would recommend the system. Tailor et al. (2025) evaluated AI-generated plain language summaries for improving interdisciplinary understanding of ophthalmology notes, finding significant improvements in diagnostic understanding (increased by 9.0 percentage points, 95% CI 0.3–18.2), note detail satisfaction (increased by 21.5 percentage points, 95% CI 11.4–31.5), and explanation clarity (improved by 23.0 percentage points, 95% CI 12.0–33.1), with 90% of summaries reported as accurate by ophthalmologists despite some errors requiring oversight.(10) Bundy et al. (2024) reported that AI-facilitated documentation improved engagement during patient encounters by reducing cognitive burden and allowing physicians to focus more on personalized patient interactions.(35) Sadeh-Sharvit et al. (2023) demonstrated superior clinical outcomes with AI-supported behavioral interventions, reporting 34% depression symptom reduction compared to 20% with treatment as usual (effect size d = 0.82 vs. d = 0.34), 29% anxiety symptom reduction versus 8% with standard care (effect size d = 0.78 vs. d = 0.14), and significantly improved session attendance (mean 5.24 vs. 3.14 sessions).(36)

Patient-discharge support systems

Multiple evidence syntheses provide limited but meaningful evidence regarding AI applications in patient discharge support, with findings primarily focused on length of stay optimization and readmission risk reduction. AI applications in patient flow management demonstrate potential for improving discharge-related outcomes, with studies showing that AI can improve patient flow by streamlining administrative tasks and optimizing resource allocation, though predictive variables for length-of-stay and readmission rates remain inconsistent across the literature.(13) In nursing care settings, AI systems show promise for supporting discharge-related processes through measurable outcomes including length of stay reduction, decreased emergency department visits, reduced intensive care unit (ICU) transfers, and fewer medical emergency team calls, alongside improvements in the number of revisions of care plans.(37) The integration of AI in nursing care has demonstrated potential for enhancing patient outcomes through early disease detection and minimizing diagnostic errors, which may contribute to more appropriate discharge timing and post-discharge care planning.(15) While digital phenotyping represents a potential long-term solution for transforming care into a more preventative and personalized model that could support post-discharge monitoring, the current evidence base remains limited, with researchers emphasizing the need for more empirical studies focusing specifically on discharge support applications and their clinical effectiveness in real-world healthcare settings.(13; 37)

Single studies demonstrate significant potential for improving the quality and efficiency of discharge documentation across different clinical specialties. Ali et al. (2025) investigated large language models for generating neurosurgical operative notes, finding that AI-generated notes were comparable to surgeon notes in accuracy (4.44 vs. 4.33;) but had lower content quality scores, used more advanced reading levels, and could be generated significantly faster, though requiring human oversight for clinical depth and nuanced observations.(38) Janota and Janota (2025) evaluated AI-generated psychiatric discharge summaries using a comprehensive scoring system across multiple quality dimensions, finding that AI-generated reports achieved competitive scores with Case 2 receiving the highest overall score of 103 points compared to 98 points for physician-generated reports, while Case 1 showed human superiority (101 vs. 97 points), with AI excelling particularly in medical terminology accuracy and understandability for outpatient physicians receiving the discharge summaries.(39) Patel et al. (2024) compared ChatGPT versus surgeon-generated informed consent documentation for plastic surgery procedures, finding that AI-generated forms were significantly shorter (1023 vs. 2901 words), more readable (11.2 vs. 15.2 Flesch-Kincaid grade level), with no significant differences in accuracy and completeness, suggesting potential for standardizing routine consent documentation while maintaining clinical quality.(40) Koh et al. (2025) provided additional case perspective evidence on ChatGPT use in discharge summaries, demonstrating practical applications and workflow integration considerations for AI-assisted discharge documentation in

real-world clinical settings.(41) However, these studies emphasized the critical need for careful clinical review and human oversight, with AI-generated discharge summaries serving as effective initial frameworks that require physician validation to ensure clinical accuracy and completeness, particularly for complex cases requiring nuanced clinical judgment and specialty-specific considerations.

AI diagnostic and decision support tools

This evidence synthesis focuses mainly on AI tools for administrative burdens, and we included these terms in our search strategy (see Appendix 1 for details) and excluded studies that focus primarily on diagnostics/clinical decision-making with no administrative components. However, from the studies we included, we also identified helpful information about diagnostic/clinical decision-making tools under the theme of 'reducing burden and improving efficiency.'

Across multiple healthcare settings, AI-powered clinical decision support systems demonstrate measurable improvements in diagnostic accuracy, comprehension, and workflow optimization. Two medium quality evidence syntheses found that AI enhances early disease detection, minimizes diagnostic errors, and automates documentation, improving efficiency while streamlining administrative tasks that consume valuable clinical time.(7; 15) Additionally, one low quality evidence synthesis found that large language models demonstrate potential to enhance healthcare delivery by assisting in diagnosis, treatment guidance, and patient triage across both clinical and surgical settings.(19)

One low quality evidence synthesis AI shows particular promise in emergency medicine, where AI improves clinical decision-making, optimizes workflows, and supports better patient outcomes in time-critical situations.(9) Furthermore, a single study found that large language models can enhance interdisciplinary understanding of complex clinical notes, improve diagnostic comprehension among non-specialist clinicians, and assist in clinical reasoning tasks.(10) Overall, AI serves as an effective augmentation tool that enhances rather than replaces clinical judgment, supporting clinicians in complex decision-making processes while maintaining the essential human element of care.

Q2: What is known about potential barriers to and challenges with adopting AI tools among front-line healthcare providers?

We identified 13 evidence syntheses that addressed barriers and challenges to the adoption of AI tools among front-line healthcare providers. There are several common barriers identified across the evidence, which can be summarized into the following categories: system-level, organizational-level, provider-level, and patient-level barriers. At the system level, one of the common barriers identified was the quality, accuracy, and reliability of the datasets used to train AI tools. AI tools can have potential introduced biases depending on the scope and nature of the dataset used to create and train the tool. These biases can have negative implications on the accuracy of outputs, specifically for groups underrepresented in the training dataset. Seven of the evidence syntheses focussed on language models, ChatGPT-4, and AI tools more generally identified bias as a barrier.(8; 9; 15; 19; 21; 32; 37) Liability and regulatory concerns were another common barrier across the evidence for implementation of AI tools. Ensuring data privacy, patient information security, ethical considerations, and possible legal implications were mentioned in many of the syntheses, highlighting the need for AI use regulations prior to full adoption of AI tools by healthcare providers and systems.(8; 9; 13; 15; 19; 21; 33; 37; 42; 43)

At the organizational level, there were three main barriers for AI tool adoption (integrating into EHR systems, training, and funding). The first identified barrier is the difficulty of the technical integration of AI tools into existing EHR systems. One recent low-quality evidence synthesis highlighted this barrier in regard to language processing, speech recognition, and machine learning tools used by healthcare providers (Lee 2024).(21) Overcoming this barrier would require cooperation between healthcare organizations, AI companies, and EHR system companies. A second organizational barrier is the training required for healthcare providers to use AI tools in practice. Training usually occurs at an organization level to ensure consistent training across the healthcare organization. A related identified barrier is the funding required for both the training and implementation of AI tools in healthcare organizations, which can lead to

resistance to adopt AI tools. High cost of AI training and implementation was identified in three recent systematic reviews (two medium and one high quality).(14; 15; 37)

For providers, barriers and challenges to AI tool adoption surrounded themes of provider experience and knowledge in the use of AI, willingness to use the tools, and concerns relating to reduced patient empathy and connection when using AI tools instead of traditional physician communication. One recent high quality evidence synthesis of AI translation tools found that healthcare providers prefer to use human interpreters over AI translators for more detailed or emotional conversations, as a sign of respect and empathy, suggesting that AI lacks patient connection and understanding that healthcare providers provide.(32) Two evidence syntheses (one recent medium quality and one recent low quality) also reported a barrier to the uptake of AI tools amongst healthcare professionals is the fear of replacement by AI.(8; 37) These provider-level barriers need to be taken into consideration in order to increase the adoption of AI tools by healthcare providers.

At the patient-level, the evidence identified barriers relating to patient safety and patient respect. Concerns of patient safety relate to the biases introduced into AI training datasets mentioned under system-level barriers affecting outcomes on the patient-level. These biases can potentially impact patient care and should be addressed before further adoption of AI tools, as suggested by a recent evidence synthesis.(8) Relating to this issue, patient tools can often lack patient-specific context that traditional healthcare provider care takes into consideration and provides, which can lead to patient uncertainty and discomfort.(19)

There were 17 single studies that evaluated the barriers of AI tool adoption by front-line healthcare professionals. Many of the study's findings on barriers to AI tool adoption echoed the findings of the evidence syntheses. There were seven studies that addressed accuracy and technical issues as a barrier for increased implementation of AI tools, with many of the AI tools producing documentation of reporting errors.(5; 28; 35; 44-47) One study on the use of AI chatbots to reduce administration burden found that the chatbots performed least accurately for new patient encounters compared to returning patient visits.(48) Another study found that AI chatbots used for intricate documentation tasks often included interpretation outside the scope and not specific to the patient and used strange, convoluted wording.(49) A key challenge highlighted in the included studies was the loss of healthcare provider control and autonomy when using AI tools, with several studies suggesting that AI tools should be adapted to meet physician preferences as well as developed in collaboration with healthcare providers from different specialities to ensure both provider autonomy and speciality individualization in AI tools.(5; 50) These findings highlight the need for cooperation and collaboration between AI companies and healthcare providers to develop AI tools specific to the clinical workplace. A final notable finding from the single studies was the hesitation to use AI in order to preserve human connection and interaction with patients to prevent emotional disconnect and isolation in healthcare settings, as noted by a study on AI tools in ICU settings and by a study of healthcare stakeholders including physicians, patients, and healthcare managers (Song 2025).(51)

Overall, few evidence syntheses studied the facilitators of adopting AI tools among front-line healthcare providers. Of the three identified syntheses, two recent syntheses (one low quality and one high quality) highlighted the need for investment in AI training sessions and/or programs for healthcare providers as a strong facilitator for tool adoption.(13; 14) Strong organizational leadership, management, and interdisciplinary collaboration between healthcare providers, policymakers, and AI companies were common facilitators amongst all three evidence syntheses.(13; 14)

There were few single studies that evaluated the facilitators of AI tool adoption. As mentioned above, a facilitator identified in several studies was the inclusion of healthcare providers in AI tool development to ensure clinical functionality of tools. This will allow for increased willingness of tool use and easier integration into workflow. Another facilitator common amongst the included studies was AI exposure and training for healthcare providers. One study on using AI to assist writing clinical notes found that increased exposure to the AI tool reduced hesitation in using the tool in practice.(5) Healthcare systems interested in increasing AI tool adoption within their systems should focus on provider exposure and training to increase acceptance and use of tools.

Key findings from jurisdictional scans

Q3: What AI tools have been used in health systems in Canada and in select international jurisdictions (i.e., Australia, Denmark, Finland, Iceland, New Zealand, Norway, Sweden, the United Kingdon (U.K.), and the United States (U.S.)) to reduce administrative burden among front-line healthcare providers, and what has been learned about their adoption and impact?

What is known from Canadian and international jurisdictions about the effectiveness of AI tools for reducing administrative burden among front-line healthcare providers?

Jurisdictional evidence was collected through environmental scanning of government reports, healthcare system case studies, professional association publications, and health technology assessments (see Appendix 4 and 5 for details). Sample sizes and detailed methodologies were often unavailable in jurisdictional sources, as these typically represented policy documents rather than formal research studies.

We found AI scribing and documentation tools have demonstrated the most substantial documented effectiveness. Canada Health Infoway is working to increase use of AI in healthcare by partnering with industry and public partners for adoption of AI technologies including AI scribes, scheduling tools, and analytic planning decision support systems. Scale AI, a federally funded AI global innovator based in Montreal, aims to improve Canada's AI supports in healthcare to streamline processes, improve service delivery, and optimize hospital operations. CareWay, a Canadian-based AI medical assistant scribe, has partnered with CAN Health Network to streamline physician workflows by generating medical documentation and completing medical forms during consultations, with collaboration aims to improve workflow, increase efficiency, reduce clinician burnout, and increase patient care.

Several provinces have piloted AI scribe technologies with notable results. British Columbia shows the strongest documented effectiveness evidence. The AI Scribe Burdens pilot program found participating physicians experienced a reduction of 2.7 hours per week of administrative tasks, with projections of 5.7 hours saved weekly on post-appointment documentation. Notably, 97% of participating clinicians would recommend an AI scribe, and 78% felt they would be more efficient with the tool. Additionally, 78% of participating patients felt they received increased attention from their physician. In Ontario, clinicians using AI scribes reported a 70% reduction in documentation time, saving up to four hours per week, with over 80% of providers expressing interest in continuing to use AI scribes beyond the pilot phase. The tool enabled 79% of participants to spend more time on patient care, while 76% experienced a reduction in cognitive burden during clinical encounters. Saskatchewan provides AI Scribe Resources through the Saskatchewan Medical Association to help physicians identify appropriate solutions, noting that benefits include reduced burden, enhanced patient experience, reduced time, increased patient care time, reduced cognitive load, and improved workflow.

Patient scheduling and triage support tools have shown significant operational efficiency gains across multiple jurisdictions. Fraser Health Authority in British Columbia developed AI tools that helped staff better understand trends in patient arrivals and optimize scheduling in emergency departments, while their AI discharge prediction tool demonstrated 86% accuracy, four times more accurate than traditional human predictions, potentially increasing discharge capacity from 250–300 patients to 600 patients per day. A similar tool is being developed for hospitalists to predict surges and proactively adjust clinician workflow. Quebec's Centre hospitalier de l'Université de Montréal (CHUM) achieved substantial operational gains, developing AI scheduling models that reduced time to organize radiologist appointments by half, freeing up 11 additional hours of treatment per day without increasing staff. AI applications for predicting patient treatment times achieved a 5% increase in efficiency in infusion clinics, equating to 11 extra hours of treatment capacity daily. Nova Scotia is collaborating with Google Cloud to implement AI healthcare tools by fall 2025, including natural-language search functions that enable clinicians to quickly find relevant details in patient health records, saving time in navigating files and enhancing decision-making.

Predictive and discharge support systems have demonstrated measurable accuracy improvements and workflow optimization. Fraser Health Authority's AI discharge prediction tool showed 86% accuracy in predicting when patients are ready for discharge, which is four times more accurate than traditional human predictions. With this tool, 600 patients might be discharged in a day, compared to 250–300 without it. At Unity Health Toronto, the Emergency Department Nurse Assignment Tool reduced the time to assign up to 27 nurses per shift from three hours to 15 minutes or less, while also decreasing the repeat rate of nurses being assigned to the same role in consecutive shifts from over 20% to 5%. St. Michael's Hospital's CHARTWatch Surgical AI tool monitors patient data in real-time to predict deterioration risks, resulting in a 26% reduction in unexpected deaths in units where the tool is active since its October 2020 implementation.

Communication and documentation support tools show promise in streamlining administrative processes. Quebec's CHUM collaborated with AssistIQ to implement AIQ Capture for tracking single-use surgical instruments in real-time, leading to a 24.5% cost reduction and potential annual savings between $4.5 million and $8.4 million. Newfoundland and Labrador is supporting SiftMed with $553,693 to enhance its AI-driven platform that sorts medical documents and predicts claim complexities, improving risk assessment and triage. Northwest Territories has implemented Fujifilm endoscopy systems with CADEYE AI software in hospitals, supporting front-line providers by automating polyp detection and characterization, allowing clinicians to focus more on patient care rather than manual interpretation and administrative tasks.

Provincial investment and development Initiatives demonstrate commitment to AI effectiveness research. Alberta is investing $9.5 million through Alberta Innovates in research projects aimed at integrating AI into healthcare spaces, including development of AI scribe technology and improving Alberta 811 Health Link efficiency. The University of Alberta is developing and piloting AI scribe technology for emergency departments in partnership with Alberta Health Services. Quebec announced an $8 million investment in IVADO (Institute for Data Valorization) to strengthen the province's AI ecosystem. Nova Scotia plans to invest $42 million over five years in its Google Cloud partnership for AI healthcare tools.

Outside of Canada, international evidence supports these effectiveness findings. In Finland, research projects indicate that AI solutions could potentially save more than 30% of nurses' working hours by automating tasks such as patient registration and information review, allowing them to focus more on patient care. Denmark's Teton.ai's AI-powered nurse assistant uses sensor and camera technology to monitor patient movements and automate routine checks and documentation, reducing staff workload by 25% during nights while improving patient safety. Emergency departments in North Denmark Region implemented AI tools to automatically read X-rays and identify fractures, processing nearly 30,000 scans since June 2023 without missed significant fractures or complaints. Sweden has committed SEK 4,351,390 (approx. $620,000 CAD) through AI Sweden's partnership with Unity Health Toronto to develop AI-driven collaboration platforms that improve diagnostics, treatment, and resource utilization, with expected long-term outcomes to improve patient care, decrease administrative burden for healthcare staff, and enable more efficient use of resources. New Zealand's Health Research Council invested $5 million in AI research specifically targeting administrative burden reduction, identifying 'low-hanging fruit' including automating scheduling for visits and procedures, as well as typing up notes and routine patient communications. Australia's National Science Agency reported that AI can be used at a systems level to identify areas needing improvement, reduce administrative burden, and allow more time for patient care, while at a clinician level enabling more time for patient care, reducing cognitive demand, and streamlining diagnostic planning. Iceland developed AI systems for automating medical record coding in Icelandic aligned with international ICD standards, with pilot projects successfully reducing workload for healthcare staff through AI-handled patient interactions covering over 1,200 medical issues.

While the evidence from jurisdictional scans demonstrates clear effectiveness potential for AI tools in reducing administrative burden, with documented time savings ranging from 25% to 70% across different applications, most findings come from pilot projects or early implementation phases. The evidence shows positive impacts on provider experience and some patients experience metrics, though comprehensive data on long-term health outcomes, cost-

effectiveness, and equity impacts across diverse healthcare settings and provider populations remains limited, indicating a need for sustained evaluation studies.

What is known from Canadian and international jurisdictions about potential barriers to and facilitators of adopting AI tools among front-line healthcare providers?

There are several jurisdictions that have introduced programs and products to help facilitate the adoption of AI tools by front-line healthcare providers. Within Canada, Canada Health Infoway, a federally funded not-for-profit organization that works to increase digital health innovation and secure information sharing, has developed a toolkit to assist healthcare systems across Canada to understand and implement AI and a procurement toolkit to ensure compliance to AI regulations, ethics, and safety. The Canadian government also developed The AI Strategy for the Federal Public Service 2025–2027 to ensure AI adoption and use by public servants aligns with government values, delivers the greatest benefits, and is efficiently and collaborative developed, and that risks and harms are mitigated.

Several provinces have developed documents or tools with guiding principles for the development and use of AI in healthcare settings. In British Columbia, Doctors of BC published a policy statement outlining the measures they believe are important to successfully integrating AI technology into healthcare spaces. Some of the recommendations published in the statement include involving physicians in AI leadership and governance, establishing risk mitigation, ensuring continuous monitoring and evaluation of AI use in healthcare spaces, prioritizing privacy protections, transparency, training for clinicians, and ensuring consideration of ethical implications. In Alberta, the Alberta Medical Association developed a Principles and Policy document outlining their position on the use of AI in healthcare. This document includes their stance on ethics, patient care, physician education, implementation processes, medical accountability, privacy and data management, environmental impact, and governance and regulation in relation to AI use in healthcare settings. Similarly in Saskatchewan, the College of Physicians and Surgeons of Saskatchewan created a guidance document for AI in medical practice, and in Manitoba both the College of Physicians and Surgeons of Manitoba and the College of Physiotherapists of Manitoba created guidelines for the use of AI in clinical practice. In Ontario, OntarioMD launched the AI Knowledge Zone to support clinicians in adopting and utilizing AI tools, particularly AI scribes, within primary care settings. This tool includes resources on privacy and legal guidance for AI use in clinical settings.

Several provinces have committed to funding AI projects and companies for the purpose of AI tools in healthcare settings. For example in Alberta, Alberta Innovates has given $9.5 million in funding to research projects aimed at integrating AI into healthcare spaces. Also in Quebec, the Quebec government recently announced an $8 million investment in IVADO (Institute for Data Valorization) to strengthen the province's AI ecosystem. In Newfoundland and Labrador, the provincial government is supporting a 13-month research and development project focused on enhancing its AI-driven platform that sorts medical documents and predicts claim complexities, improving risk assessment and triage in healthcare systems.

Outside of Canada, several countries that have also introduced programs and products to help facilitate the adoption of AI tools by front-line healthcare providers. In Australia the Australian Medical Association, the Australian Alliance for Artificial Intelligence in Healthcare, the Royal Australian College of General Practitioners, and the Australian College of Nursing have released statements regarding the responsible use of AI in healthcare settings. In Denmark, three key centres have been established for AI development including the Centre for Clinical Artificial Intelligence (CAI-X), which aims to drive the responsible development and integration of AI in healthcare by fostering interdisciplinary collaboration, aligning solutions with real clinical needs. In Norway, a coordinated cross-agency initiative was implemented led by the Directorate of Health that aims to strategically guide the safe and effective implementation of AI into the health system, including AI tools that aim to reduce administrative burden.
Several jurisdictions have committed to funding healthcare-focussed AI projects and companies including in New Zealand, where New Zealand's Health Research Council invested $5 million NZD in health research focused on the use of AI, including in applications of AI designed to reduce administrative burden. Also, Sweden, in partnership with Unity Health Toronto, have committed approximately $620,000 CAD to better manage missed patient appointments through

AI-driven collaboration platforms for healthcare leaders and data scientists that improve diagnostics, treatment, and resource utilization.

Next steps based on the identified evidence

The following are potential next steps that could be considered by government policymakers, system and organizational leaders, professional leaders, and citizen leaders based on the findings outlined above. We place a particular emphasis on addressing major gaps in our understanding, as well as overcoming barriers and building on facilitators that can lead to the successful adoption of AI tools to reduce administrative burden.

Research priorities that could be considered as next steps:

- Conduct longitudinal effectiveness studies that extend beyond pilot phases to evaluate sustained impact of AI tools on administrative burden reduction, provider satisfaction, and patient outcomes over two-to-five year periods.
- Evaluate the effectiveness of AI tools in underrepresented settings, particularly rural and remote healthcare environments where evidence is currently absent despite significant potential for impact.
- Examine the differential effectiveness of AI tools across diverse provider populations and patient demographics to identify potential equity impacts and optimization opportunities.
- Assess long-term cost-effectiveness of AI implementations, moving beyond initial time savings to evaluate comprehensive return on investment including reduced burnout, improved retention, and enhanced care quality.
- Based on the evidence, barriers to adoption, such as lack of experience with AI tools and reluctance to use tools, should be addressed with organizational training of AI tools.

Next steps that are relevant to policymakers, system and organizational leaders, and professional leaders to support successful adoption of AI tools to reduce administrative burden:

- Increase collaboration between healthcare providers, AI companies, and policymakers to allow for better integration of AI tools into healthcare-specific settings.
- Increase research on AI tools for front-line healthcare providers will allow for more robust effectiveness findings, which in turn will assist in reducing provider reluctance to engaging with the tools.
- Exercise caution when using AI tools in healthcare settings in order to protect provider autonomy, patient respect, and patient-specific needs.

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