



GUIDANCE TO THE PROFESSION

# Artificial Intelligence (AI) in Medical Practice

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## PREAMBLE

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Guidance from the College provides information to express or clarify the College’s view on a particular matter. It is intended as guidance for physicians in areas where research and current practice are evolving or changing rapidly, the implementation of processes and procedures may be premature, or it is timely to communicate the College’s stance on an issue before a bylaw, policy, or professional guideline is developed. It is available on the College’s webpage under [Guidance to the Profession](#).

## Key Takeaways

1. AI should augment, not replace, professional medical judgment
2. Physicians remain fully accountable for clinical decisions
3. Continuous learning and interdisciplinary collaboration are important
4. Ethical considerations, including privacy and bias mitigation, are CPSS expectations
5. The guidance is designed to be flexible, recognizing the rapidly evolving nature of AI in healthcare

## EXECUTIVE SUMMARY

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### Overview

This document provides direction for physicians and healthcare professionals on the ethical, practical, and regulatory aspects of AI use in healthcare settings.

### Key Components

1. **Introduction**
  - Acknowledges the rapidly evolving role of AI in healthcare

- Formal policies and bylaws may be developed as the field matures

## 2. **Scope**

- Applies to all CPSS registrants and healthcare professionals using AI
- Covers a wide range of AI applications in healthcare, from diagnostic support to patient engagement

## 3. **Guiding Principles for Responsible AI Use**

- Outlines 14 key principles, including patient-centered care, transparency, privacy, bias mitigation, and continuous learning

## 4. **Patient Interactions and AI**

- Guides physicians on handling AI-generated information

## 5. **Alignment with Other Bodies**

- References statements and reports from:
  1. College of Family Physicians of Canada (CFPC)
  2. Royal College of Physicians and Surgeons of Canada (RCPSC)
  3. University of Saskatchewan (USask)

## 6. **Core Concepts and Definitions**

- Provides detailed definitions of AI technologies, healthcare practices, ethical considerations, and governance aspects

## 7. **Resources**

- Provincial, national and international resources are listed.

## **Conclusion**

The CPSS emphasizes that while AI offers significant potential to enhance healthcare, it must be implemented responsibly. Physicians must balance the benefits of AI with their ethical responsibilities, ensuring that patient care remains at the forefront of all decisions involving AI technologies.

## **INTRODUCTION**

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The College of Physicians and Surgeons of Saskatchewan (CPSS) acknowledges the rapidly evolving role of Artificial Intelligence (AI) in healthcare. This guidance is intended to support physicians in responsibly integrating AI tools into their practice, recognizing that formal policies and bylaws may be developed as the field matures.

It's worth noting that formal policies and bylaws may be developed as the field matures. This means that the current guidance is seen as an interim step, allowing for a more measured and informed approach to eventually developing more formal regulations.

In essence, guidance on AI in healthcare provides a balanced approach that acknowledges the potential of the technology while also recognizing the need for ethical considerations and professional responsibility. It offers

direction without being overly prescriptive, which is particularly valuable in a rapidly changing field like AI in healthcare.

The CPSS emphasizes that AI should serve to augment, not replace, professional medical judgment and care. Physicians must remain fully accountable for their clinical decisions and continue to uphold their ethical responsibilities to prioritize patient well-being and safety.

## SCOPE

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The CPSS guidance on AI in medical practice applies to all physicians, medical students, residents and healthcare professionals registered with CPSS who utilize AI technologies in clinical settings. It encompasses a wide range of AI applications in healthcare, covering both existing and emerging technologies. The scope includes AI systems used for diagnostic and treatment support, patient care and monitoring, personalized medicine, administrative tasks, drug development, population health management, mental health support, telemedicine, surgical and emergency care, medication management, and patient education and engagement. The guidance emphasizes the responsible implementation of AI tools across all areas of medical practice, focusing on ethical considerations, patient safety, and the augmentation of professional medical judgment.

## GUIDING PRINCIPLES FOR RESPONSIBLE AI USE

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### 1. **Patient-Centered Care and Professional Judgment:**

AI should enhance patient care, not replace the essential role of physicians. Physicians are expected to apply AI insights with critical evaluation and remain the central decision-makers in the care process.

### 2. **Informed Consent and Transparency:**

Physicians must be transparent with patients about when and how AI is used in their care. This includes providing clear explanations about the capabilities and limitations of the AI tools employed.

### 3. **Privacy, Confidentiality, and Data Security:**

Physicians must ensure that AI systems comply with privacy regulations, including The Health Information Protection Act (HIPA) and CPSS guidelines. Care should be taken to safeguard patient data, particularly in de-identification processes, and to respect Indigenous data sovereignty principles (OCAP®).

### 4. **Bias and Equity:**

Physicians should be aware of the potential for AI tools to introduce biases that may affect certain populations. AI systems should be evaluated to ensure equitable care across all patient demographics.

### 5. **Accountability:**

Physicians retain full responsibility for the outcomes of care, even when AI tools are employed. They must be prepared to justify their clinical decisions, whether they align with or diverge from AI-generated recommendations.

6. **Continuous Learning and Evaluation:** Physicians should commit to ongoing education about AI technologies and their applications in healthcare. They should regularly evaluate the performance and impact of AI tools used in their practice.
7. **Interdisciplinary Collaboration:** Encourage collaboration between healthcare professionals, member organizations, health authorities, universities, other medical regulators, AI developers, data scientists, and ethicists to ensure AI systems are designed and implemented in ways that are clinically relevant, ethical, and supportive of patient care.
8. **Explainability and Interpretability:** Prioritize the use of AI systems that can provide explanations for their outputs or recommendations. This supports informed decision-making and helps maintain trust in AI-assisted care.
9. **Error Management and Adverse Event Reporting:** Establish protocols for identifying, managing, and reporting errors or unexpected outcomes related to AI use. This supports continuous improvement and patient safety.
10. **Cultural Sensitivity and Inclusivity:** AI systems should be designed and used in ways that respect cultural diversity and promote inclusivity, particularly in diverse healthcare settings.
11. **Environmental Responsibility:** Consider the environmental impact of AI systems, particularly those that require significant computational resources. Strive for energy-efficient AI solutions in healthcare.
12. **Patient Empowerment:** Use AI as a tool to empower patients, enhancing their understanding of their health conditions and involving them more actively in their care decisions.
13. **Interoperability and Data Sharing:** Promote the development and use of AI systems that can work across different platforms and healthcare settings, facilitating better coordination of care while maintaining data security and privacy.
14. **Human-AI Interaction:** Design AI systems with a focus on effective human-AI interaction, ensuring that the technology supports and enhances the work of healthcare professionals rather than creating additional burdens

## PATIENT INTERACTIONS AND AI

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- **Patients Using AI-Generated Information:**

Physicians should be prepared for patients to bring AI-generated health data to consultations. Physicians are encouraged to approach such situations respectfully, ensuring that any decisions made align with professional judgment and established medical standards.
- **Physician Preparedness:**
  - Physicians should familiarize themselves with common AI health tools and platforms that patients might use. Physicians are encouraged to participate in education to navigate conversations about AI-generated health information.
- **Critical Evaluation:**

- Physicians should critically evaluate AI-generated information, considering its source, methodology, and limitations. They should be prepared to explain to patients why certain AI-generated recommendations may or may not be applicable to their specific case.
- **Professional Judgment:**
  - While considering AI-generated information, physicians must rely on their professional judgment and established medical standards when making clinical decisions. It is important to explain to patients how professional expertise complements or sometimes overrides AI-generated advice.
- **Patient Education:**
  - Physicians may take the opportunity to educate patients about the strengths and limitations of AI in healthcare. Guidance on how to critically evaluate health information from AI sources can be provided to patients.
- **Shared Decision-Making:**
  - AI-generated information can serve as a starting point for shared decision-making discussions between physicians and patients. Physicians can use these interactions to enhance patient engagement and health literacy.

## 1. REFERENCE TO THE [COLLEGE OF FAMILY PHYSICIANS OF CANADA \(CFPC\) STATEMENT](#)

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The **College of Family Physicians of Canada (CFPC)** has emphasized the need for family physicians to remain central to patient care despite the growing role of AI technologies in healthcare. The CFPC's statement underscores the importance of maintaining the humanistic aspects of medical practice while leveraging AI to enhance clinical decision-making, patient management, and operational efficiencies.

Key points from the **CFPC** statement include:

- **Patient-Centered Focus:**

AI should serve as a tool to augment clinical practice, not diminish the physician-patient relationship. Family physicians should prioritize empathy, communication, and patient-centered care even when using AI tools.
- **Support for Primary Care Practice:**

AI tools can support family physicians in managing large patient populations, streamlining administrative tasks, and enhancing diagnostic accuracy, particularly in areas like preventive care, chronic disease management, and personalized treatment.
- **Ethical Responsibility and Accountability:**

Family physicians must remain responsible for clinical decisions, regardless of AI input. The CFPC highlights that AI should complement, not replace, the professional judgment of family physicians, ensuring that decisions remain patient focused.
- **Continuous Education:**

The CFPC encourages ongoing education on the use of AI technologies, ensuring that family

physicians remain well-versed in the limitations, capabilities, and ethical implications of AI applications in primary care settings.

The CPSS aligns with the CFPC's guidance by encouraging all physicians, especially those in family medicine, to consider AI as a supportive tool rather than a replacement for human expertise. Physicians must continue to engage in meaningful dialogue with their patients, ensuring that AI enhances rather than detracts from patient-centered care.

For more detailed guidance, the CFPC's position paper on AI and its implications for family medicine is available on the [College of Family Physicians of Canada \(CFPC\) website](#).

## 2. REFERENCE TO THE [ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA \(RCPSC\) TASK FORCE REPORT](#)

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The **Royal College of Physicians and Surgeons of Canada (RCPSC)** established a task force to examine the role of Artificial Intelligence in specialty practice. The task force's report emphasizes the need for careful integration of AI in medical specialties, highlighting several key areas of focus:

- **Physician Training and Competence:**

The RCPSC task force recommends that specialty physicians receive adequate training in the understanding and application of AI. This includes understanding the technical underpinnings of AI tools, their limitations, and how to critically evaluate AI-driven clinical outputs. The report stresses the need for continuous professional development to keep pace with the evolving AI landscape.

- **Collaboration and Interdisciplinary Research:**

The report underscores the importance of interdisciplinary collaboration between physicians, AI developers, data scientists, and ethicists. This collaboration is essential to ensure that AI tools are designed and applied in ways that are clinically relevant and ethically sound. The RCPSC encourages physicians to engage in research aimed at optimizing AI applications within their specialties.

- **Ethical and Regulatory Oversight:**

The RCPSC emphasizes the importance of ethical AI use, particularly in safeguarding patient data, ensuring transparency in AI systems, and addressing biases. The task force calls for the development of robust governance frameworks and regulatory oversight to ensure that AI applications do not compromise patient care or professional integrity.

- **Patient-Centered Care and Informed Consent:**

The task force echoes the principle that AI must complement, not replace, human judgment. Physicians are encouraged to maintain strong patient-physician relationships, ensuring transparency around AI use in clinical decisions. Informed consent remains critical, especially when AI significantly influences treatment options.

- **Bias Mitigation and Equity:**

The report highlights the risk of bias in AI systems, particularly in specialties where diagnostic and treatment decisions may disproportionately affect vulnerable populations. Physicians are urged to be vigilant about how AI is trained and applied, ensuring that biases are identified and mitigated.

The RCPSC task force report provides a comprehensive roadmap for AI integration in specialty practice. It advises physicians to remain engaged in the critical evaluation of AI tools, ensuring that these technologies enhance patient outcomes while adhering to ethical standards. The full task force report is available on the **Royal College of Physicians and Surgeons of Canada (RCPSC)** website for further review.

### 3. REFERENCE TO THE [UNIVERSITY OF SASKATCHEWAN \(USASK\)](#) PROVISIONAL STATEMENT ON ARTIFICIAL INTELLIGENCE

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The **University of Saskatchewan (USask)** has issued a provisional statement regarding the application of Artificial Intelligence (AI) in healthcare and medical education, reflecting the institution's commitment to ensuring ethical and effective AI integration in these fields.

Key points from the **USask Provisional Statement** include:

- **AI in Medical Education:**  
The statement emphasizes the importance of preparing medical students and healthcare professionals for the growing role of AI in clinical practice. It highlights the need for integrating AI training into medical curricula, ensuring that future physicians are equipped with the knowledge to use AI tools responsibly and effectively. This includes understanding both the capabilities and limitations of AI systems, as well as the ethical considerations involved in their use.
- **Ethical Considerations and Professional Accountability:**  
USask's provisional statement mirrors broader ethical concerns regarding AI, stressing the importance of maintaining professional accountability in the face of AI-driven decision-making. Physicians and healthcare professionals must continue to prioritize patient safety and the integrity of the physician-patient relationship, using AI as a support tool rather than a substitute for clinical judgment.
- **Research and Innovation:**  
USask encourages interdisciplinary research between healthcare professionals, AI developers, and data scientists to foster innovation in AI applications. The institution recognizes that collaboration is critical to developing AI tools that meet the clinical needs of Saskatchewan's diverse population, ensuring that AI is not only technologically advanced but also contextually relevant.
- **Data Sovereignty and Privacy:**  
USask's statement stresses the importance of respecting data sovereignty, particularly for Indigenous populations. Physicians must ensure that AI systems respect the principles of ownership, control, access, and possession (OCAP®) when using data from Indigenous communities. This aligns with broader efforts at the university and within Saskatchewan to support equitable healthcare outcomes and respect Indigenous rights in the use of medical data.
- **Bias Mitigation and Equity:**  
The statement highlights the need to address potential biases in AI systems that could disproportionately impact certain patient populations. USask advocates for the development and use of AI systems that promote fairness and equity in healthcare, ensuring that all patients receive high-quality care regardless of demographic factors.



The **University of Saskatchewan** encourages ongoing dialogue within the healthcare community on the ethical and practical implications of AI use, recognizing that the technology is evolving rapidly. Physicians and healthcare professionals are encouraged to remain informed about AI developments and to participate in research initiatives that aim to improve AI applications in healthcare.

For more detailed information, the [University of Saskatchewan \(USask\) Provisional Statement on Artificial Intelligence](#) is available on the USask website.

## CORE CONCEPTS AND DEFINITIONS

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### AI Technologies and Techniques

- **Artificial Intelligence (AI):** A broad term for systems that perform tasks typically requiring human intelligence, such as learning, decision-making, and pattern recognition. In healthcare, AI supports diagnosis, treatment planning, and patient care.
- **Machine Learning (ML):** A subset of AI that allows systems to learn from data without explicit programming. It is often used in healthcare for predictive analytics, personalized treatment plans, and disease detection.
- **Deep Learning (DL):** A specialized form of machine learning using neural networks with many layers. It excels at tasks such as image and speech recognition, particularly valuable in fields like radiology and pathology.
- **Natural Language Processing (NLP):** AI technology that enables computers to understand, interpret, and generate human language. In healthcare, NLP is used to analyze clinical notes, medical literature, and patient-reported outcomes.
- **Generative AI (GenAI):** Advanced AI capable of generating new content based on large datasets, such as text, images, or audio. In healthcare, it can create educational materials, treatment plans, or synthetic data for research.
- **Large Language Models (LLMs):** A type of GenAI that uses massive datasets to generate human-like text, assisting in tasks like medical documentation and literature reviews.
- **Computer Vision:** AI systems designed to interpret and analyze visual information. In healthcare, it plays a crucial role in analyzing medical images and videos.
- **Explainable AI (XAI):** AI systems designed to provide clear explanations for their decisions or outputs. In healthcare, XAI is crucial for understanding AI-driven diagnoses or treatment recommendations, enhancing trust and allowing for meaningful human oversight.
- **Federated Learning:** A machine learning technique that trains algorithms across multiple decentralized devices or servers holding local data samples, without exchanging them. This approach can be particularly valuable in healthcare for maintaining patient privacy while leveraging diverse datasets.
- **Edge AI:** AI algorithms processed locally on a device, rather than in the cloud. In healthcare, this can be used for real-time analysis of patient data from wearable devices or for maintaining data privacy.





## AI in Healthcare Practice

- **Augmented Intelligence:** The combination of human and artificial intelligence to enhance cognitive and decision-making abilities. It emphasizes the supportive, rather than replacement, role of AI in healthcare.
- **Human Oversight:** AI should complement, not replace, human expertise. Physicians remain responsible for overseeing AI applications and mitigating risks associated with errors or malfunctions.
- **AI Model Drift:** The degradation of AI model performance over time due to changes in the underlying data distribution or real-world conditions. In healthcare, monitoring and addressing model drift is important for maintaining the accuracy and reliability of AI systems.
- **Interoperability:** The ability of different AI systems or healthcare technologies to exchange and make use of information seamlessly. This is important for integrating AI tools across different healthcare settings and systems.

## Ethical and Regulatory Considerations

- **Ethical Considerations:** The moral principles that guide the use of AI in healthcare, including fairness, accountability, and the potential to perpetuate or mitigate biases. Ethical AI use requires adherence to established professional standards and privacy obligations.
- **Regulatory Compliance:** AI tools must adhere to relevant laws and regulations, including those from Health Canada and the Saskatchewan Ministry, to ensure safety, efficacy, and ethical use.
- **Patient Privacy and Confidentiality:** AI systems must safeguard patient privacy and comply with relevant privacy laws, such as The Health Information Protection Act (HIPA). Special attention should be given to the protection of identifiable patient data.
- **Data Sovereignty:** Indigenous peoples' control over the collection, ownership, and use of data related to their communities, with respect to AI applications.
- **Informed Consent:** The process of obtaining voluntary agreement from patients regarding the use of AI in their care, after providing information about the AI's role, risks, and benefits.
- **Transparency:** The open communication about how AI is used, its capabilities and limitations, and its impact on clinical decision-making.
- **Bias:** Systematic errors or flaws in AI design or data that may result in unfair or discriminatory outcomes, particularly for vulnerable populations.
- **AI Fairness:** The practice of ensuring that AI systems do not discriminate against individuals or groups based on protected characteristics such as race, gender, or age. In healthcare, this is crucial for ensuring equitable care and outcomes.
- **Differential Privacy:** A system for publicly sharing information about a dataset by describing patterns of groups within the dataset while withholding information about individuals. This concept is important for protecting patient privacy when using large datasets for AI training.

## Governance and Quality Assurance

- **Governance Policies:** Internal policies established by healthcare organizations to ensure AI tools are used ethically and responsibly.
- **Adverse Event:** Any unintended or unexpected outcome related to AI use that harm or negatively impacts patient care.
- **AI Auditing:** The process of systematically examining an AI system's algorithms, data, and outputs to ensure compliance with ethical standards, regulatory requirements, and performance expectations.
- **AI Ethics Committee:** A group of experts responsible for reviewing and guiding the ethical use of AI within a healthcare organization, ensuring alignment with ethical principles and regulatory requirements.

## Data and Model Management

- **Synthetic Data:** Artificially generated data that mimics the statistical properties of real data. In healthcare, synthetic data can be used to train AI models without compromising patient privacy.

## CONCLUSION

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The integration of AI into healthcare presents both opportunities and challenges. While AI has the potential to enhance care, physicians must ensure its use aligns with their ethical responsibilities. The CPSS will continue to monitor advancements in AI and may update this guidance to reflect new developments. Physicians are encouraged to engage with the guidance from the **CFPC**, **RCPSC**, and **USask** to ensure that AI integration in their practice prioritizes patient safety, data sovereignty, and professional accountability.

## RESOURCES

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**CPSS:** [Virtual Office Assistants](#)

### Canadian Resources:

1. Canadian Medical Protective Association (CMPA): The CMPA offers advice on the Health Canada has published a "[Draft Guidance for machine learning-enabled medical devices](#)," providing guidance for manufacturers and users regarding the safe and appropriate application of AI in healthcare. It also provides guidance on "[The emergence of AI in healthcare](#)", "[Navigating AI in healthcare](#)", and "[AI Scribes: Answers to frequently asked questions](#)".
2. Canadian Association of Radiologists (CAR): The CAR has released a white paper on "[Artificial Intelligence in Radiology](#)", discussing the potential impact of AI on radiology practice.
3. Royal College of Physicians and Surgeons of Canada: The Royal College has resources on "[AI in medical education](#)" and [practice](#)".

4. The Federation of Medical Regulatory Authorities of Canada (FMRAC) approved summary statements on artificial intelligence in the practice of medicine: "[Artificial Intelligence and the Practice of Medicine](#) and [The Continuum of Artificial Intelligence](#)"
5. Office of the Privacy Commissioner of Canada: released principles for [responsible, trustworthy and privacy protective degenerative AI technologies](#)
6. The Canadian Institute for Health Information published a document "[A Path Forward Toward Respectful Governance of First Nations, Inuit and Métis Data Housed at CIHI](#)"
7. Health Canada has several resources, including:
  - "[Artificial Intelligence and Data Act](#)"
  - "[The Artificial Intelligence and Data Act \(AIDA\) – Companion document](#)"
  - "[Pan-Canadian Health Data Charter](#)"
  - "[Bill C-27: Digital Charter Implementation Act, 2022](#)"
  - "[Draft guidance: Pre-market guidance for machine learning-enabled medical devices](#)"

#### Provincial Resources:

8. College of Physicians and Surgeons of British Columbia (CPSBC): The CPSBC has an Interim Guidance Document regarding "[Ethical Principles for Artificial Intelligence in Medicine](#)".
9. College of physicians and surgeons of Manitoba (CPSM): published advice to the profession on the "[responsible use of artificial intelligence in the practice of medicine](#)"
10. College of Physicians and Surgeons of Ontario (CPSO): CPSO has published advice to the profession titled "[AI scribes in clinical practice](#)".
11. College of Physicians and Surgeons of Alberta (CPSA): CPSA has guidance on "[Artificial Intelligence in Generated Patient Record Content](#)".

#### International Resources:

12. World Health Organization (WHO): The WHO's document on the "[Ethics and Governance of Artificial Intelligence for Health](#)" provides global perspectives on ethical and governance issues related to AI in healthcare.
13. American Medical Association (AMA): The AMA has published a policy on "[Augmented Intelligence in Medicine](#)".
14. U.S. Food and Drug Administration (FDA): The FDA has released guidance on "[Artificial Intelligence/Machine Learning \(AI/ML\)-Based Software as a Medical Device \(SaMD\) Action Plan](#)".
15. Royal College of Radiologists (UK): They have published guidance on "[Artificial intelligence](#)"
16. Federation of State Medical Boards (FSMB): The FSMB has released a document on "[Navigating the Responsible and Ethical Incorporation of Artificial Intelligence into Clinical Practice](#)".

## ACKNOWLEDGEMENTS

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This document serves as guidance from the College and reflects the current understanding of AI's role in medical practice. It is meant to assist physicians in making informed decisions about integrating AI into their work, maintaining professional standards, and safeguarding patient care. The CPSS acknowledges information derived from CPSBC, CPSA, CPSM, CFPC, USask, RCPSC and CPSO documents pertaining to artificial intelligence