The Use of Artificial Intelligence in Irish General Practice

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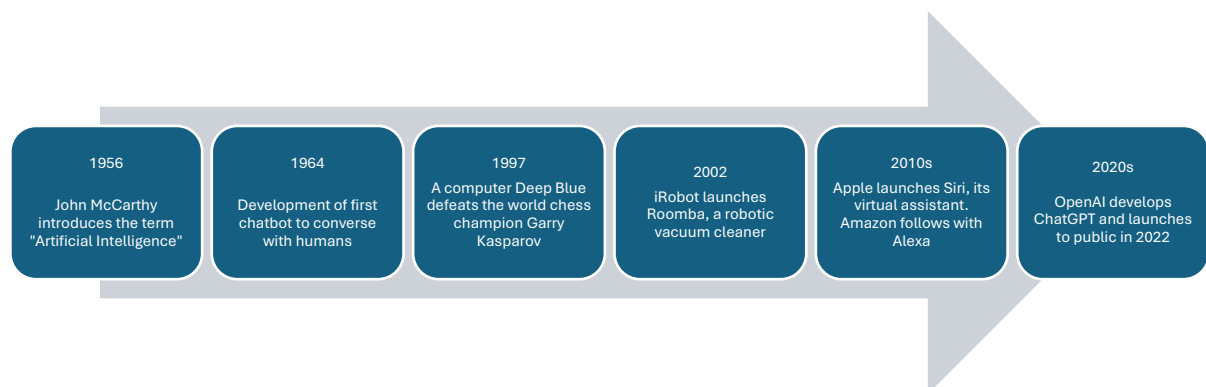
Irish College of GPs

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HSE

Introduction

Artificial intelligence (AI) has the potential to become transformative for healthcare in the next few years, and it is likely that AI will be used by GPs on a daily basis to assist their practice. This will create both benefits and challenges.

There is no universal, simple definition of artificial intelligence because it covers a range of technologies which will be outlined below. However, a common theme is that AI can receive information and process it based on previous learning and experience, resulting in the generation of outputs such as predictions, content, recommendations and decisions.[1]

The concept of AI has existed for many years, particularly where the scope has been limited to very specific functions – we call this "Narrow AI". This could range from powerful chess playing computers[2] to the simpler algorithms used for automated ECG or blood pressure monitoring which are becoming more sophisticated. In contrast, artificial "general" intelligence (AGI) is a term used to describe systems that could understand, learn and apply knowledge in multiple domains, like humans. It is unknown how an AGI system, smarter than any human could ever be, would behave. As AI tools are evolving quickly we are undoubtedly headed in that direction, which is in equal parts intriguing and frightening![3]

Historical Evolution of AI

1956	1964	1997	2002	2010s	2020s
John McCarthy introduces the term "Artificial Intelligence"	Development of first chatbot to converse with humans	A computer Deep Blue defeats the world chess champion Garry Kasparov	iRobot launches Roomba, a robotic vacuum cleaner	Apple launches Siri, its virtual assistant. Amazon follows with Alexa	OpenAI develops ChatGPT and launches to public in 2022

Recent AI Developments

With the explosion of data available to computers via the Internet and with ever increasing computer power, AI has become increasingly complex since the start of the 2020s. This has been most obviously seen in the development of large language models (LLM) such as ChatGPT, Microsoft Copilot and Google Gemini. Large Language Models (LLMs) work by analysing vast libraries of text to identify patterns and relationships between words. They aim to predict and generate plausible language based on the input or "prompt" that the user enters.

Generally speaking, the better and more complete the prompt, the better the output. However, doctors should be aware that patient identifiable information must never be entered as a prompt, since processing and storage of information could lead to breaches of confidentiality, which is the cornerstone of the doctor-patient relationship.

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[1] https://artificialintelligenceact.eu/article/3/

[2] https://www.chess.com/terms/deep-blue-chess-computer

[3] https://www.mckinsey.com/featured-insights/mckinsey-explainers/whats-the-future-of-ai

Potential Uses of AI in General Practice

In healthcare, AI methods can be used to analyse large amounts of patient data, such as medical records, imaging studies, and laboratory results, to support clinical decision-making and improve patient outcomes.[4]

The potential uses of AI for GPs are many and are likely to evolve over time, perhaps quite rapidly and involving the many facets of AI.

- Ambient AI refers to environments with electronic devices that are aware of and can recognize the presence of human beings and adapt accordingly. Examples include smart devices and health wearables.
- Conversational AI is based on Natural Language Processing (NLP), which aims to enable computers to simulate human conversation. Examples would be chatbots.
- Generative AI, or gen AI, is a type of artificial intelligence (AI) that can create new content, be that text, images or other media. Best known examples might be ChatGPT or Dall-E.

Many AI tools use a combination of different AI subtypes. An example would be digital scribe technology which can automate parts of the clinical documentation process for GPs. In this use case, ambient AI in the form of a microphone can unobtrusively record the content of a conversation between GP and patient. Using conversational AI, a transcript of that consultation can be produced. Furthermore, using generative AI, a structured summary of that consultation can be created for saving in the patient's health record.

(For more information on digital scribes, see Appendix A)

There are an increasing number of AI tools designed for use in healthcare, including general practice.[5] Examples would be:

- Voice recognition software, which can reduce the need for typing and allow the doctor to focus more on the patient. This may save time and lead to more satisfying consultations. Furthermore, the GenAI component can add further capabilities such as structured notes from the recordings, and coding on the basis of content.
- Administrative tools that can be used in different ways to improve efficiency. Patient-facing tools could assist with triage and improve access to practice services. Within the practice, AI can be used to automate and streamline a variety of administrative tasks.
- Generative AI can be used to create high quality content to support and communicate with patients, and to personalise it for individual requirements e.g. for website consent or patient information leaflets
- Wearable technology has the potential to more accurately monitor patient health in the community, allowing more timely care and increasing patient involvement in managing their own health conditions
- Clinical decision support is the use of AI to take in patient information from a variety of sources, and to make recommendations or suggestions that can assist doctors in managing and personalising patient health care.

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[4] Dave, M., Patel, N. Artificial intelligence in healthcare and education. *Br Dent J* **234**, 761–764 (2023). https://doi.org/10.1038/s41415-023-5845-2

[5] https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2814643

Risks and Problems associated with the use of AI

The full integration of AI into Irish general practice still faces challenges, including data privacy concerns, the need for GP training, and the acceptance of AI tools by both practitioners and patients. This is discussed in more detail in the following table.

Accuracy	Generative AI is only as good as the quality and quantity of available data. No AI tool is 100% accurate therefore human oversight is required. AI models can generate incorrect answer or "hallucinations"[6]
Sensitive information	Doctors should not enter sensitive information into current AI tools due to privacy risks (input may be stored, logged, or accessed, potentially violating patient confidentiality and data protection laws) and a lack of data security guarantees in these quickly evolving tools.
Bias & Inequality	Good quality medical data and AI tools may favour affluent societies. Humans differ - data from one population may not be applicable to another[7]
Transparency & explainability	Doctors and patients should have some understanding of how AI works, and of how recommendations are reached. Doctors and medical students need education in the use of AI.
Trust & over-reliance	Not trusting AI tools may inhibit practice development. Being over-trusting of AI could lead to errors, to reduction in clinical skills and a failure to honestly evaluate the technology.
Data Privacy & Security	This is an area of high risk for AI users. The need to maintain privacy and security of patient health data in line with GDPR is paramount. Specific EU and national legislation on AI should be followed.
Consent	New ways of data processing using AI requires explicit patient consent. The doctor should understand how their AI tools work, so that they can adequately consent patients on the relevant issues.
Integration & Implementation	To benefit GPs and patients, AI must facilitate and not impair administrative and clinical workflow. It will work best when seamlessly interoperable with or integrated into GP software
Liability	Contract clauses may redirect liability from AI developers to GPs. The responsibility for the use of these tools may rest with the individual employing them and should be discussed with medical indemnifiers.

The use of artificial intelligence in health care is likely to evolve rapidly in the 2020s, bringing a need for updated governance, regulation and legislation. It is advisable that GPs using AI in clinical practice should keep themselves well informed of changes or updates in these areas.

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[6] https://www.clinicaltrialsarena.com/news/hallucinations-in-ai-generated-medical-summaries-remain-a-grave-concern/

[7] https://postgraduateeducation.hms.harvard.edu/trends-medicine/confronting-mirror-reflecting-our-biases-through-ai-health-care

Digital scribes are AI tools which help automate the process of recording clinical consultations, and are part of the first emerging technologies that are available for GPs. They use advances in speech recognition, natural language processing (NLP) and AI to automatically document spoken elements of the consultation, and to create outputs such as a structured summary of that consultation or a referral letter.[8] [9]

This concept is not new[10] but the technology has improved dramatically in the 2020s. Therefore, there are a number of digital scribe tools available on the market to use as stand-alone AI tools, however it is likely that in time these will be integrated into GPs' clinical softwares alongside other features incorporating AI.
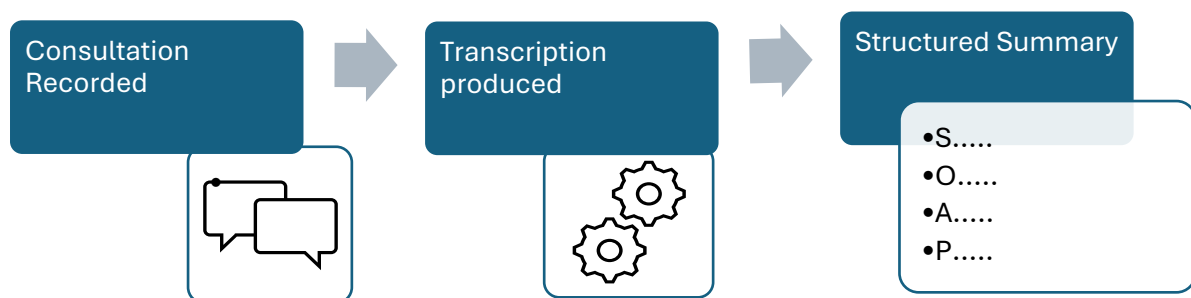
Implementing an AI-supported digital scribe can vastly improve the documentation process in clinical practice. They may save you time, improve interactions with your patients, and allow you to create better quality clinical notes. However, AI scribes do not have 100% accuracy, and may take time to adjust to your style of practice. Their output should always be checked, even though doing this may cancel out time-saving from not typing!

AI systems used in healthcare, such as digital scribes, are classified as high-risk and must adhere to stringent regulations, therefore ensuring compliance with the EU AI Act and obtaining informed patient consent are critical steps.

By using the following check list (Table 1 below) to ask the scribe software vendor the right questions, you can ensure the chosen solution is as accurate and secure as possible, and may seamlessly integrate into your existing systems and workflows.

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[8] Coiera, E., Kocaballi, B., Halamka, J. *et al*. The digital scribe. *npj Digital Med* **1**, 58 (2018). https://doi.org/10.1038/s41746-018-0066-9

[9] Cao, David Y. et al. Artificial intelligence-driven digital scribes in clinical documentation: Pilot study assessing the impact on dermatologist workflow and patient encounters
JAAD International, Volume 15, 149 - 151

[10] Klann, J.G., Szolovits, P. An intelligent listening framework for capturing encounter notes from a doctor-patient dialog. *BMC Med Inform Decis Mak* **9** (Suppl 1), S3 (2009). https://doi.org/10.1186/1472-6947-9-S1-S3

Table 1.

Data Sharing	Do they provide a signed data-sharing agreement?
	Have they a Data Privacy Impact Assessment (DPIA) template?*
Accuracy	How does the AI handle multiple speakers in a conversation and the nuances of patient encounters, ensuring accurate transcription?
	How accurate is the AI in transcribing medical terminology?
Integration	Can the AI scribe integrate seamlessly with your existing Electronic Health Record (EHR) system?
	Or do you rely on "Copy and Paste"?
Data Security	What data is collected and why?
	Does it rely on cloud-based delivery/storage?
	Is data anonymised and how?
	What security measures are in place to protect patient data?
	Is the data processed within the EEA?
	Is the system compliant with EU data protection standards?
	Have they certification of the above?
Regulation	Has the scribe been approved by any regulatory authority for medical devices in Ireland, or in any other jurisdictions?
Customisation	How customisable is this for your needs as a GP?
	Does it support different templates for specific scenarios?
Implementation	What training for staff is there to ensure safe and efficient use?
	What support is provided in case of problems?
	Is there a data breach policy and are regular audits performed?
	What updates for future improvements are planned?

*Even though the company provides you with a DPIA template, it is your responsibility to complete i.e. to conduct a DPIA for your own practice