

ASA POSITION STATEMENT: Artificial Intelligence and Sonography

Summary

- AI in sonography has the potential to enhance diagnostic accuracy, streamline workflows, and improve healthcare delivery but also has its limitations, including variability and quality assurance and security and privacy concerns.
- AI is not a replacement for sonographers' independent clinical judgment. Sonographers remain professionally and ethically responsible for interpretation and patient care.
- As AI tools are introduced in clinical settings, sonographers play a key role in advocating for their safe, evidence-based use to ensure optimal patient care and safety.
- The ASA supports a shared responsibility model among sonographers, employers, and vendors for the responsible use of AI.
- The ASA is dedicated to supporting sonographers in the responsible implementation of AI through education, resources, and advocacy, upholding the highest professional and ethical standards.

Definitions

- **Artificial Intelligence (AI):** A broad term for technology (computers, machines) designed to simulate human intelligence. AI systems can perform tasks such as perception, comprehension, language translation, decision-making, and problem-solving. These systems transform input data (e.g. text, images or sounds) into meaningful outputs, such as predictions, classifications, or translations.
- **Generative AI:** An AI model that has been pre-trained and is designed to generate new content, such as text, images, or sounds. It is typically accessed and used through a user-friendly interface or prompt system.
- **Machine Learning (ML):** A method used to create and train AI models that learn from data instead of relying on explicit rules. Modern ML techniques, such as deep learning can identify patterns and interpret medical images. These models improve performance over time by continuously learning from new data.

Background

- AI is reshaping healthcare, offering new avenues for enhancing diagnostic precision, optimising workflows, and improving patient care. AI-driven tools can analyse vast datasets, identifying patterns that support faster, more accurate, and personalised care.
- Examples of medical devices that use AI include chatbots that provide treatment suggestions to patients or healthcare professionals and clinical decision support systems that use generative AI to create symptom summaries and diagnosis recommendations. Additionally, AI can be integrated into medical imaging devices to interpret and analyse images or videos, aiding in tasks such as assisting with real-time ultrasound imaging.

- In Australia, the Therapeutic Goods Administration (TGA) regulates AI as a “medical device” when it is used for diagnosis, prevention, monitoring, prediction, prognosis, treatment, or alleviation of disease, injury or disability. Medical devices can include any app, website, program, internet-based service, or package or can be part of an ecosystem with cloud components or a standalone product.
- Generative AI tools used in clinical practice such as AI scribing are usually intended for a general purpose and do not have a therapeutic use or meet the definition of a medical device and therefore are not regulated by the TGA.

Discussion

- The ASA recognises AI has several potential benefits to advance sonographic practice and healthcare delivery, including:
 - greater efficiency by augmenting sonographic workflows, patient management, clinical history analysis and assistance with preparing diagnostic reports.
 - enhanced diagnostic accuracy through improved measurement of structures, feature detection and automatic routine image analysis tasks.
 - supporting sonography services in rural and remote areas as AI tools can enable real-time image analysis, supporting telehealth and remote diagnostics, which enhances patient care, access and equality across geographical boundaries.
- However, AI also brings accompanying risks and challenges, including:
 - data privacy and security - AI tools that utilise patient data for training or diagnostics must comply with strict data privacy regulations as data mismanagement – especially of sensitive health information – can pose significant risks for patient confidentiality.
 - interpretability and quality assurance – Machine learning in sonography faces challenges due to its real-time, dynamic nature, non-standard imaging planes, operator technique differences, and image quality variations across platforms. Internal validation of AI tools for specific clinical settings may be required to enable sonographers to adapt AI applications effectively to unique patient scenarios
 - ethical considerations and bias: AI systems are susceptible to biases inherent in the training data, which can impact diagnostic outcomes. Biased algorithms could potentially skew results, compromising patient care.
- While the ASA recognises the potential of AI to improve health outcomes, it cannot replace the expertise and independent judgment of sonographers. Sonographers play a vital role as the critical link between patients and their ultrasound devices, adapting to different patient circumstances and interactions to optimise imaging and ensure the best possible care outcomes. AI can serve as a valuable tool to support and enhance sonographic practice, but its use must be carefully monitored to maintain the highest standards of patient care.
- In recognition of AI’s growing role in contemporary healthcare, sonographers have a critical role in advocating for the safe, evidence-based use of the technology to maximise patient care and safety such as:
 - Patient interaction: Sonographers play an essential human role that AI cannot replicate, including explaining procedures and ensuring comfort. This involves

securing patients' informed consent, explaining AI's role in their care, and addressing any patient concerns.

- Clinical validation: Sonographers are critical overseers in the AI diagnostic process, validating AI outputs of a patient anomaly or disease by applying clinical judgment, correcting inaccuracies, and contextualising AI insights based on the patient's unique medical history and symptoms and verifying that a diagnosis is correct. This real-time oversight helps ensure that AI supports, rather than replaces, accurate diagnostic outcomes.
- AI adaption and training: Sonographers can actively contribute to developing and refining AI tools. By providing feedback on AI usability and limitations in real-world practice, sonographers help shape AI systems to align with clinical needs, improving functionality and safety over time. Sonographers' ongoing input in training and adapting AI systems is essential for ensuring these tools are suitable for diverse patient scenarios.
- Education and training - Effective AI use requires sonographers to develop new skills to understand, interpret, and implement AI findings into their workflow. Comprehensive training programs that equip sonographers with the necessary AI competencies are critical for ensuring safe and proficient AI use.

AI Principles for use in Sonography

- **Shared responsibility model** – The ASA supports a shared responsibility approach to the use of AI in sonography, recognising that its successful integration depends on collaboration between vendors, organisational leadership, and clinical staff to ensure safety, accuracy, and effectiveness.

Roles and responsibilities should be clearly defined, acknowledging that individual sonographers may not be involved in the design or implementation of AI systems. While AI provides valuable support in patient care, sonographers retain ultimate responsibility for interpreting and applying AI-generated insights.

To ensure safe and effective use, sonographers need a foundational understanding of AI design, evaluation, and limitations. Access to relevant product information, including training data, intended use, and system limitations, is essential for making informed decisions about AI integration into clinical workflows

Sonographers are encouraged to engage in continuous learning to stay current with AI advancements. They should actively participate in discussions on AI performance, provide feedback, and contribute to ongoing improvements. Collaborative oversight is key to maintaining AI reliability and ensuring it remains a safe and effective tool that supports, rather than replaces, sonographers' clinical expertise and professional judgement.

- **Transparency** – Sonographers should inform patients when AI is used during their care, explaining its role and addressing any questions or concerns. The amount and type of information disclosed will depend on how and when the AI is used in the imaging process.

When discussing AI, sonographers should clearly distinguish between AI and artificial *assistance*. In ultrasound, current embedded technologies are not self-learning; rather, they draw on existing data or reference databases to support the sonographer by providing comparative information. This distinction is important to help patients understand that the technology is assisting, not replacing, clinical judgement.

If AI has been involved in interpreting the imaging, patients should be advised. This disclosure should include relevant details such as confidence levels, known risks or limitations of the AI tool, and whether a second review by a qualified healthcare professional - either onsite or remotely - has taken place.

- **Ethical and Legal Compliance-** Sonographers must continue to apply their professional judgement and expertise when utilising AI, in alignment with their professional responsibilities, including those outlined in the *Sonographer Code of Conduct*. Their clinical knowledge and decision-making remain central to the delivery of quality care, with AI acting as a supportive tool - not a replacement - for their expertise.

Sonographers must ensure confidentiality and privacy legislation compliance. In particular, practitioners should obtain explicit patient consent when using AI that processes personal patient data. Therefore, awareness of organisational protocols and the potential for data to be used in AI model training is essential. Practitioners are encouraged to review their professional indemnity insurance and ensure it adequately covers all aspects of their practice, including the use of AI.

Recommendations

- The ASA advocates for the responsible, safe and evidence-based use of AI by sonographers in line with best practice professional and ethical guidelines.
- The ASA supports a shared responsibility model among sonographers, employers, and vendors for the responsible use of AI.
- The ASA supports comprehensive training, professional development and curriculum development to equip future and current sonographers with AI-related skills and knowledge, ensuring responsible and proficient use of these tools.

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