a healthier world through sonographer expertise

ASA POSITION STATEMENT | Artificial Intelligence and Sonography

Summary

- AI in sonography has the potential to improve diagnostic accuracy, streamline workflows and enhance healthcare delivery. However, it also has limitations including variability in performance, quality assurance challenges and concerns around data security and patient privacy.
- AI is not a replacement for sonographers' clinical expertise. Sonographers remain professionally and ethically responsible for interpreting findings and delivering safe, high-quality care.
- As AI tools are introduced in clinical settings, sonographers play an important role in promoting their safe, evidence-based use. The ASA supports a shared responsibility model involving sonographers, employers and vendors to ensure AI is used appropriately.
- The ASA is committed to supporting sonographers through education, resources and advocacy to ensure AI is implemented responsibly and in line with the highest professional and ethical standards in Australia and New Zealand.

Definitions

- **Artificial Assistance:** Artificial intelligence designed to perform a specific task using predefined rules or data without the ability to learn or adapt beyond its programmed function. In the case of ultrasound technology, the embedded software equipment is not currently learning but rather referring to existing examples and databases and providing information back to the sonographers using the equipment.
- **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.

- In sonography, AI tools are increasingly integrated into imaging systems to assist with routine tasks and enhance workflow. Examples include automated fetal biometry measurements, real-time image quality feedback, anatomical structure recognition and intelligent exam checklists that help ensure image completeness. These tools support the sonographer by improving efficiency, reducing variability, and enhancing diagnostic consistency.[3,4]
- 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.[9]
- 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.[9]
- The ASA considers that AI tools should not be used as part of medical devices unless approved by the TGA in Australia or Medsafe in New Zealand.

Discussion

- The ASA recognises AI has several potential benefits to advance sonographic practice and healthcare delivery, including:
    - greater efficiency by streamlining sonographic workflows, such as patient data entry, clinical history analysis, and assistance with diagnostic reports.[2-4]
    - enhanced diagnostic accuracy through improved measurement of structures, feature detection and automatic routine image analysis tasks.[5]
    - reduced scan times and minimised repetitive movements,[4] which may help lower the risk of musculoskeletal injuries.
    - improved quality assurance via intelligent exam checklists and feedback tools
    - support for rural and remote sonography services by enabling real-time image analysis, telehealth integration, and decision support for less experienced practitioners.[4]
- 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.[4-5]
    - **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.[2,4]

  - **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.[2]

- 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.[4]
  - **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.[3]
  - **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.[3,7]

Professional and ethical considerations for sonographers when using AI

All AI use requires consideration of ethical and professional issues when providing patient care.

Importantly, AI is not a replacement for sonographers' clinical expertise, meaning that sonographers remain professionally and ethically responsible for interpreting findings and delivering safe, high-quality care. Therefore, they must continue to exercise professional judgement when using AI, ensuring alignment with best practice professional and ethical standards, including the Sonographer Code of Conduct.

- **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.

  While AI supports patient care, sonographers retain ultimate responsibility for interpreting and applying AI-generated outputs. Therefore, access to product information including training data, intended use and system limitations is essential for making informed decisions about AI integration into clinical workflows. Enabling entry-level sonographers to obtain a good understanding of algorithm development as part of their training will be an important part of sonographers' understanding of instrumentation.[2,4]

  Sonographers should be aware of the governance arrangements established by their employer, hospital or practice to oversee the implementation, use and monitoring of AI. To be aware of current AI advancements, sonographers are encouraged to engage in continuous learning and professional development on AI. 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.[3]

- **Patient privacy and confidentiality:** Each jurisdiction has legal obligations around the collection, use and disclosure of patient data and information. It is important for sonographers to be aware about the impact on patient privacy of using AI at any stage, whether undertaking diagnostic imaging or reporting so that patients' privacy and confidentiality is not inadvertently breached. This may involve being aware of whether the patient data being used/recorded is also used to train the AI model for future patients and whether identifiable patient data then becomes part of that learning database.[1]

- **Patient consent and transparency:** AI tools are increasingly embedded in ultrasound systems to support image acquisition, workflow efficiency and quality assurance. Many of these tools are examples of "artificial assistance", which are designed for specific tasks such as automated fetal measurements or voice commands.[7] These tools do not learn or make decisions independently and are considered part of routine clinical care. As such, they typically do not require specific patient consent.

  However, when AI tools directly influence clinical decisions or diagnostic outcomes, particularly when used with limited sonographer oversight, patients should be informed and appropriate patient consent sought where required This includes explaining the tool's role, intended use and any known limitations or risks. The level of information provided should be proportionate to the tool's function and clinical impact.[2-3]

  Sonographers should be supported by their organisations to:

  - understand how AI is used in their workplace
  - communicate its use clearly and appropriately to patients
  - follow established clinical or workplace protocols to ensure consistent and transparent practice.

Clear communication about the use of AI supports patient trust and reinforces that AI is a clinical aid, not a replacement for the expertise and judgement of sonographers.

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.
- Due to AI's rapid evolution, the ASA recommends that this and other documents pertaining to the use of AI in sonography are reviewed every 6-12 months to enable them to be consistent with changes in this developing technology.

References

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Sonographer Policy and Advisory Committee (SPAC)

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