USING NON-INVASIVE IMAGING TO DIAGNOSE ENDOMETRIOSIS

Introduction
An endometriosis diagnosis is recognised as valuable to the wellbeing of patients, in optimising ART outcomes and in surgical triage. Diagnostic laparoscopy was the diagnostic gold standard but is difficult to access, expensive and confers risk. Improvements in imaging impelled ESHRE endometriosis guidelines, to recommend TVUS and MRI as primary diagnostic tools. However, laparoscopy is indicated when there are negative imaging findings. Imagendo uses artificial intelligence to analyse eTVUS and eMRIs to improve the diagnostic capabilities of imaging for endometriosis.

Aims: To assess the diagnostic potential for endometriosis of eTVUS and eMRI markers when compared to expert opinion.

Methods:
Over 800 eTVUS and 200 eMRIs were de-identified and digital data extracted. A multi-modal machine learning design evaluated the sliding sign in eTVUS and four signs in two modalities of MRIs to determine their diagnostic potential when compared to expert opinion and available surgical findings.

Results:
Machine learning showed that the eTVUS sliding sign had an AUC of 96.5%, PPV of 98.7%, an NPV of 47.7% and accuracy of 88.8%. Preliminary results using 4 MRI signs show similar AUCs and Accuracy. Combining the modalities improved diagnostic accuracy. The importance of obtaining quality eTVUS was highlighted.

Discussion
Artificial intelligence has the potential to develop algorithms that provide an accurate, non-invasive diagnostic tool for endometriosis, when clinicians upload eTVUS and eMRI images to a cloud-based platform. The quality of eTVUS and eMRI performance and reporting is critical and can be address by real time feedback using AI tools.