

AI Essentials: Basics and upper GI

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Podcast Episode

Endoscopy

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Two gastroenterology AI researchers discuss fundamental concepts of artificial intelligence in endoscopy, current development methods, and the state of AI applications in upper gastrointestinal tract lesion detection as of 2024.

KEY POINTS

- The speakers distinguish core AI terminology: machine learning uses labelled data and human intervention to learn from errors, while deep learning (a machine learning subfield) processes raw unstructured data with minimal supervision using neural networks that mimic human decision-making.
- AI system development requires identifying a clinical need, collecting diverse high-quality data, annotating images with clinician input, training models using backpropagation, and validating with external data the system has never encountered before regulatory approval.
- Robustness differs from generalisability: AI systems in endoscopy are narrow (solving only their trained task), but a robust system should perform equally well across different centres worldwide and on different endoscope brands, though each new system requires separate regulatory approval.
- In upper GI endoscopy, only one AI system has received approval as of the recording; the speakers expect new Barrett's oesophagus detection and characterisation systems within 2-3 years, while squamous cell cancer and gastric applications face delays due to data scarcity in Western populations.
- The speakers frame AI's expected value in Barrett's surveillance as elevating non-expert performance to expert level rather than surpassing expert detection, and note that evidence remains insufficient to demonstrate AI-targeted biopsies outperform meticulous standard-of-care protocols (virtual chromoendoscopy plus Seattle biopsies) on a per-patient basis.

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