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# IPMN-SPECTRA: Predicting Malignant Progression in Intraductal Papillary Mucinous Neoplasm Using Multimodal Data

**AI software predicting pancreatic cyst malignancy risk from multimodal MRI + clinical data to reduce unnecessary surgeries.**

Researchers at Purdue University have developed a software called IPMN-SPECTRA, which is a tool for the prediction of the cancer risk in patients with intraductal papillary mucinous neoplasm (IPMN). IPMN is a type of pancreatic cyst that progresses to pancreatic cancer in about 60% of cases. Currently, IPMNs are often surgically removed, which can lead to very significant side effects. However, most of the patients undergoing this surgery have low-grade precursors, which may not actually require surgical intervention. IPMN-SPECTRA assists clinicians in differentiating between cancerous IPMN cysts and low-grade precursors to avoid these unnecessary and potentially harmful surgeries. This tool combines AI-based analysis of routine MRI imaging and clinical data points to predict the actual risk of cancer in patients with IPMN. If clinically used, IPMN-SPECTRA may simultaneously reduce the rate of surgical overtreatment while also preventing undertreatment by improving surveillance of high-grade or cancerous cysts.

**Technology Validation:**

IPMN-SPECTRA combines imaging and clinical data through the use of deep learning. The multimodal model trained on both imaging and clinical data outperformed the multimodal model trained on imaging data only as well as unimodal models trained on weighted and contrast-enhanced MRIs alone on the hold-out test set. In addition, the multimodal model outperformed the stratification performance of the Fukuoka criteria on the holdout test set, showcasing the clinical potential of multimodal AI to personalize management in patients with IPMN.

These researchers are currently working on securing external validation of their findings from an external patient cohort. Once the external validation is

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concluded, they are planning a prospective evaluation of the resulting tool in a clinical setting.

**Advantages**:

-Reduce the rate of surgical overtreatment

-Improve detection of high-grade or cancerous cysts

-Avoid potentially significant side effects brought on by unnecessary surgeries

-AI-assisted

-Eliminates interobserver variability, as is the case with radiologists

**Applications**:

-To predict the actual risk of pancreatic cancer in patients with intraductal papillary mucinous neoplasm (IPMN), a type of pancreatic cyst.

Publications:

An abstract has been submitted to the American Society of Clinical Oncology (ASCO) 2025 Annual Meeting. The abstract will be available at asco.org/abstracts on May 22nd, 2025 at 5:00 pm.

**TRL:** 4

**Intellectual Property:**

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