USING AN ARTIFICIAL INTELLIGENCE-POWERED PANCREATIC CYST SAFETY NET TO ASSESS DIFFERENCES IN PANCREATIC CYST MANAGEMENT GUIDELINES

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Background & Introduction

- Pancreatic cysts are a common incidental radiographic finding that require risk-stratification and surveillance.
- The management of these cysts can vary due to differing societal guidelines and variations in individual practice.
- Here, we aim to create a high-throughput AI-powered safety net capable of identifying all pancreatic cyst patients across an institution, applying management guidelines, and comparing the recommendations.

Methods

- To create an institution-wide pancreatic cyst safety net (in partnership with Halo Solutions), we developed a multi-step process (Figure 1) which was applied to all CT & MRI reports from 2022 at BIDMC.
- This allowed us to extract multiple cyst features such as: size, location, solid component, wall thickening, enhancing mural nodule, main duct communication, main duct size and caliber change, cyst stable time period, local lymphadenopathy, acute pancreatitis, obstructive jaundice, family history of pancreatic cancer, elevated CA 19-9, and new onset diabetes.
- Custom software (Python) could then convert the list of risk-related findings from each report into explicit follow-up recommendations in accordance with published Kyoto, AGA, and ACR cyst management guidelines.
- Costs were then calculated based on publicly available institutional cost data.

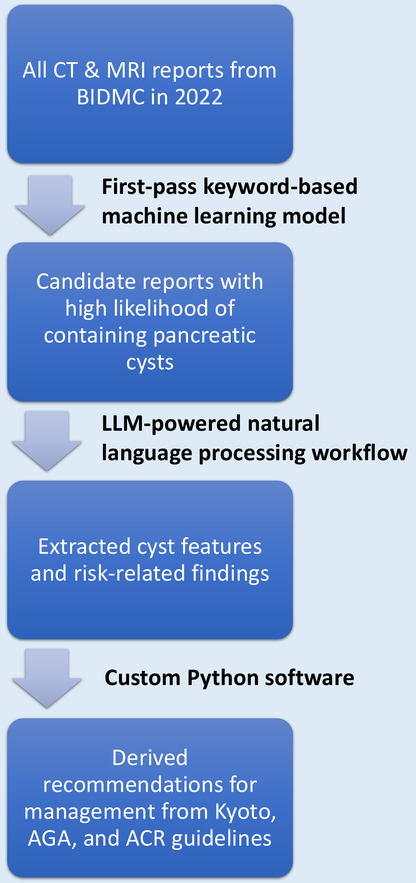


Figure 1. Schematic layout of the artificial intelligence pipeline for the pancreatic cyst safety net and guideline application

Results

Table 1. Comparison of guideline recommendations for pancreatic cyst management from 1 year of imaging reports

n=2097	Kyoto	AGA	ACR
MRI recommended	1915 (91.3%)	1708 (81.4%)	1568 (74.8%)
6 months	897 (42.8%)	0 (0.0%)	222 (10.6%)
12 months	92 (4.4%)	971 (46.3%)	637 (30.4%)
18 months	926 (44.2%)	0 (0.0%)	0 (0.0%)
24 months	0 (0.0%)	737 (35.1%)	709 (33.8%)
EUS recommended	206 (9.8%)	69 (3.3%)	381 (18.2%)
Surgery recommended*	112 (5.3%)	6 (0.3%)	40 (1.9%)
Recommend stop surveillance	0 (0.0%)	207 (9.9%)	339 (16.2%)
Unable to make recommendation	70 (3.3%)	113 (5.4%)	150 (7.2%)

*AGA and ACR guidelines are not applicable to symptomatic cysts

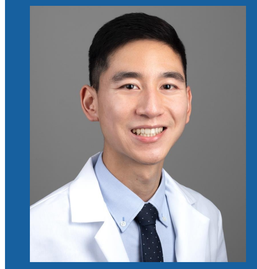
Table 2. Costs associated with guideline surveillance recommendations for pancreatic cysts generated from 1 year of imaging reports

	Kyoto	AGA	ACR
MRCP costs	$6,121,718.80	$5,459,997.76	$5,012,456.96
EUS costs	$613,925.32	$205,635.18	$1,135,463.82
Total non-surgical costs	$6,735,644.12	$5,665,632.94	$6,147,920.78

Conclusion

Artificial intelligence can be utilized to create a high-throughput institution-wide pancreatic cyst safety net. Different guidelines can then be applied to compare both management recommendations as well as costs in real-time.

Meet the Authors



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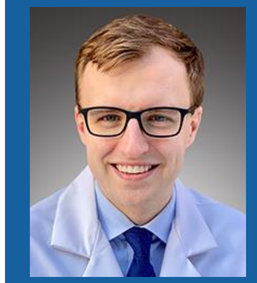

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