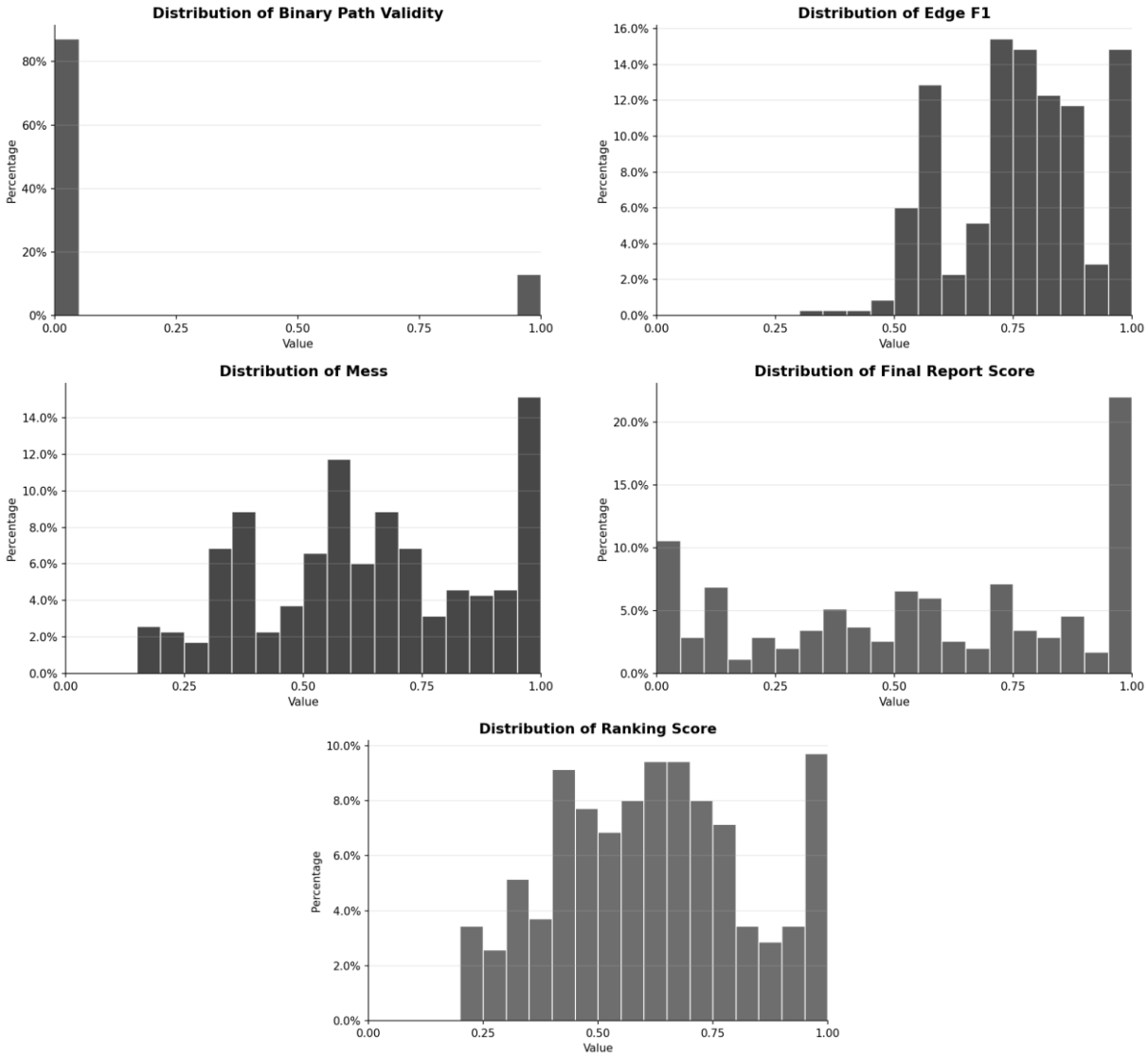
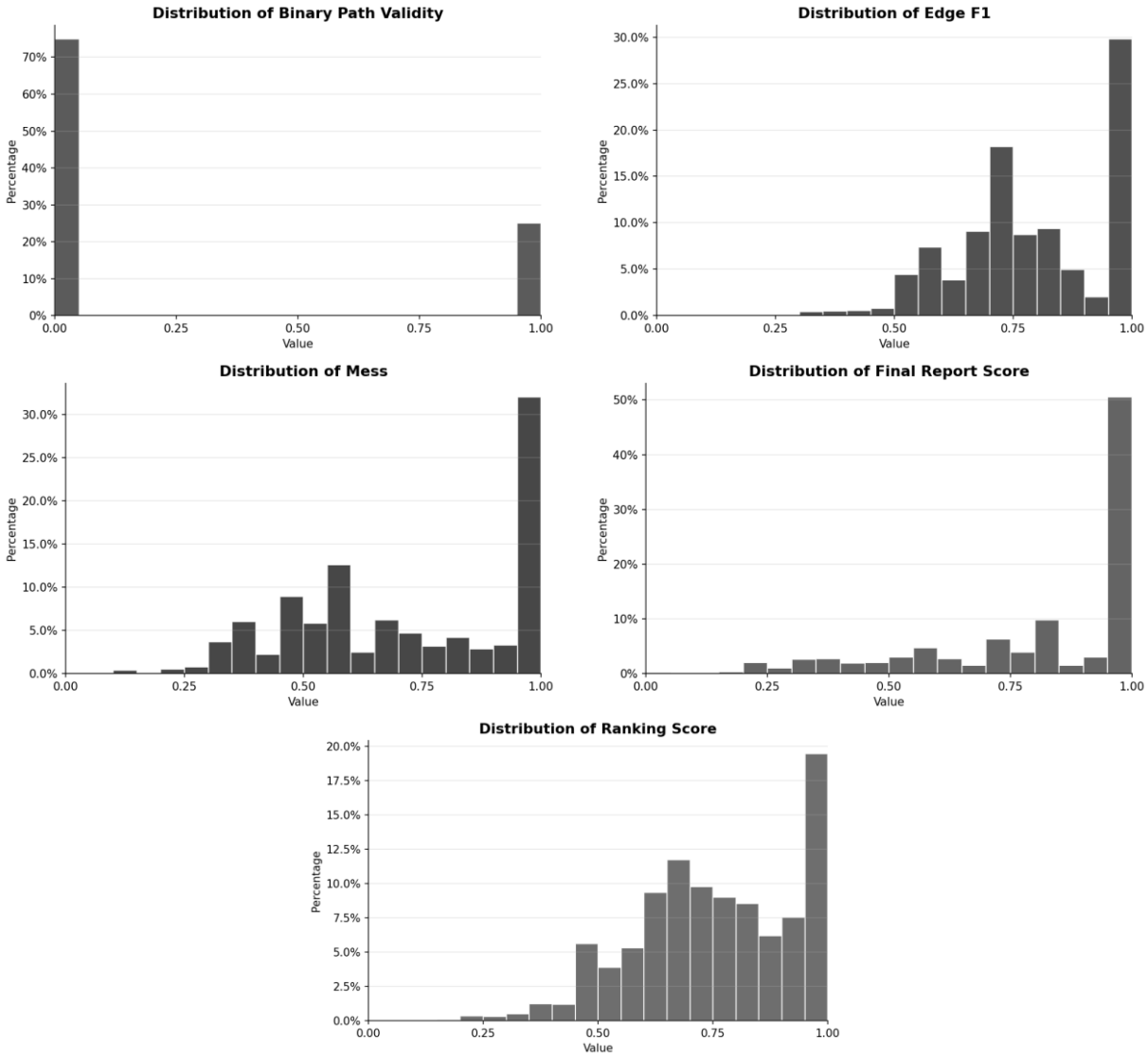
This MICCAI paper is the Open Access version, provided by the MICCAI Society. It is identical to the accepted version, except for the format and this watermark; the final published version is available on SpringerLink.

Supplementary Information

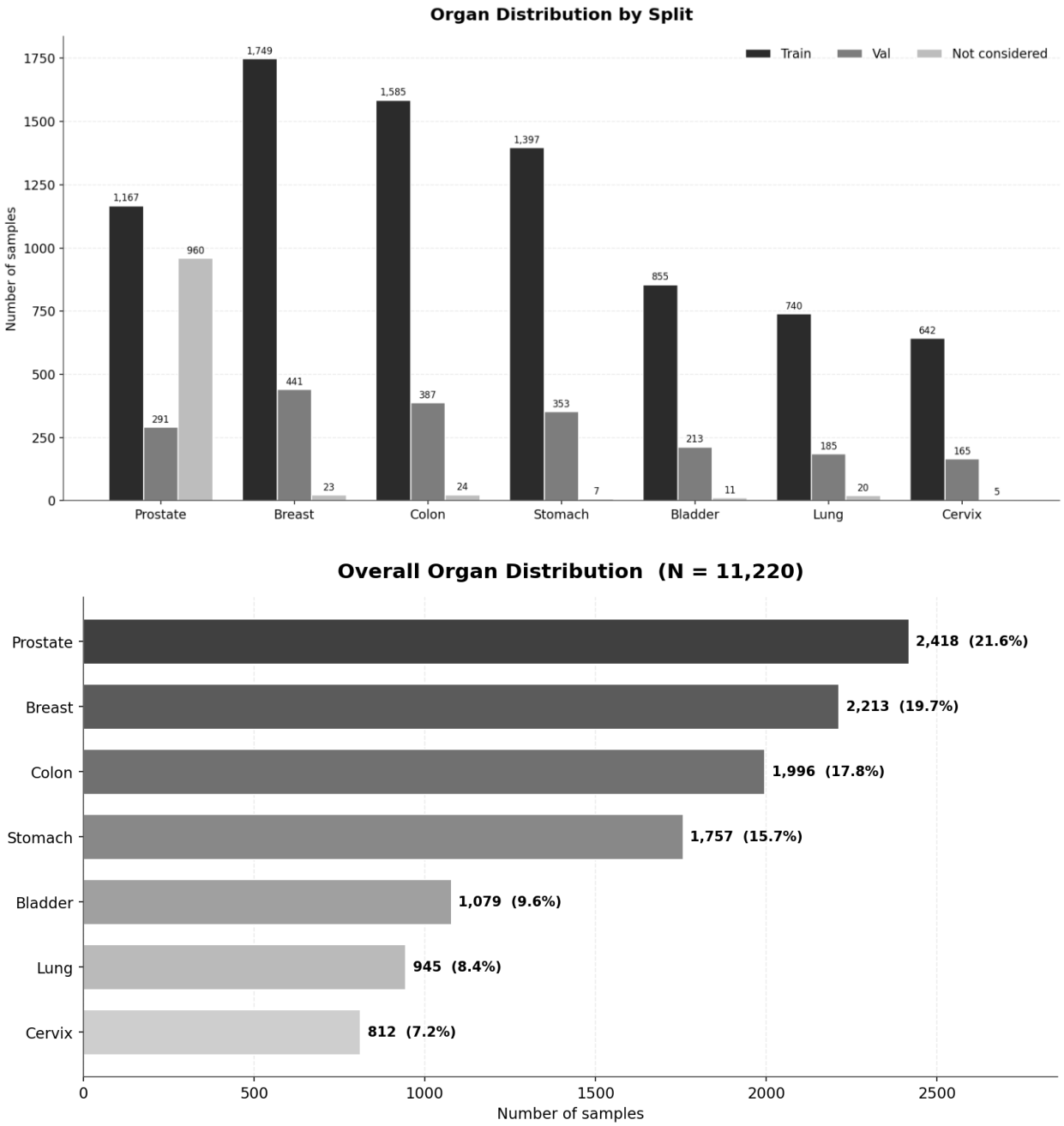
Supplementary Figure 1. Distribution of Metric A scores and corresponding sub-scores across samples from Test Phase 1.

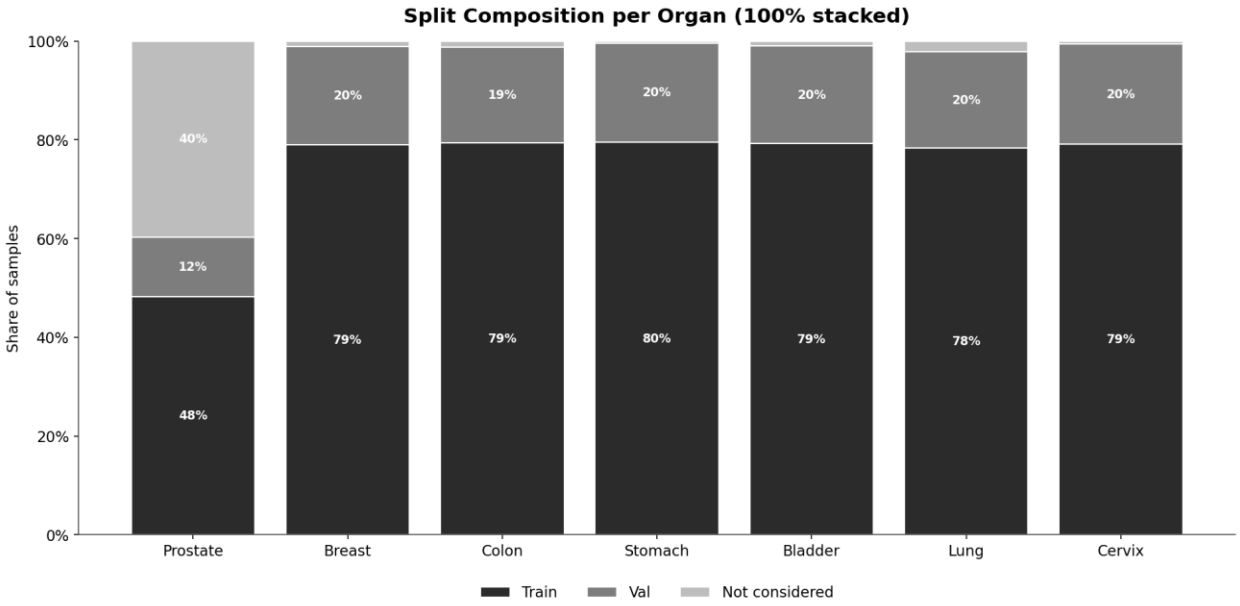


Supplementary Figure 2. Distribution of Metric A scores and corresponding sub-scores across samples from the internal validation set.



Supplementary Figure 3. Organ distribution across the training and validation splits, along with slides excluded from the analysis.





Supplementary Table S1: Performance comparison for the Top-K ablation study

Model - Inferencing Setting (k=40)	BP	MESS	Edge Precision	Edge Recall	Edge F1	Final Report score	Metric A
Original - Attention-based Top-k	0.250	0.721	0.890	0.752	0.795	0.818	0.759
Ablation 1 - Random k	0.040	0.520	0.778	0.616	0.648	0.485	0.520
Ablation 2 - Uniform weights Top-k	0.249	0.720	0.890	0.751	0.794	0.812	0.755
Ablation 3 - Graph masking disabled	0.000	0.678	0.464	0.661	0.509	0.265	0.428

Supplementary Table S2: Predicted CoT and Ground Truth CoT comparison for case id PIT_01_08019_01

Predicted CoT	Ground Truth CoT
[{ "question": "What is the organ?", "answer": "Stomach", "next_question": "Is there any abnormality present?" }, { "question": "What is the procedure?", "answer": "Endoscopic biopsy", "next_question": "Is there any abnormality present?" }, { "question": "Is there any abnormality present?", "answer": "Yes, there is an abnormality.", "next_question": "Is there any neoplasm present?" }, { "question": "Is there any neoplasm present?", "answer": "Yes, there is a neoplasm.", "next_question": "What is the primary of neoplasm?" }, { "question": "Is there any neoplasm present?", "answer": "Yes, there is a neoplasm.", "next_question": "What is the behavior of neoplasm?" }, { "question": "What is the primary of neoplasm?", "answer": "Hematolymphoid", "next_question": "What is the histologic type of neoplasm?" }, { "question": "What is the behavior of neoplasm?", "answer": "Malignant", "next_question": "What is the histologic type of neoplasm?" }, { "question": "What is the histologic type of neoplasm?", "answer": "Extranodal marginal zone B cell lymphoma of MALT type", "next_question": "What is the number of diagnoses to includes?" }, { "question": "What is the number of diagnoses to includes?", "answer": "1", "next_question": "What is the #1 diagnosis?" }, { "question": "What is the #1 diagnosis?", "answer": "Extranodal marginal zone B cell lymphoma of MALT type", "next_question": "What is the final pathology report?" }, { "question": "What is the final pathology report?", "answer": "Stomach, endoscopic biopsy;\\n Extranodal marginal zone B cell lymphoma of MALT type",	[{ "question": "What is the organ?", "answer": "Stomach", "next_question": "Is there any abnormality present?" }, { "question": "What is the procedure?", "answer": "Endoscopic biopsy", "next_question": "Is there any abnormality present?" }, { "question": "Is there any abnormality present?", "answer": "Yes, there is an abnormality.", "next_question": "Is there any neoplasm present?" }, { "question": "Is there any neoplasm present?", "answer": "Yes, there is a neoplasm.", "next_question": "What is the behavior of neoplasm?" }, { "question": "Is there any neoplasm present?", "answer": "Yes, there is a neoplasm.", "next_question": "What is the primary of neoplasm?" }, { "question": "What is the behavior of neoplasm?", "answer": "Malignant", "next_question": "What is the histologic type of neoplasm?" }, { "question": "What is the primary of neoplasm?", "answer": "Hematolymphoid", "next_question": "What is the histologic type of neoplasm?" }, { "question": "What is the histologic type of neoplasm?", "answer": "Extranodal marginal zone B cell lymphoma of MALT type", "next_question": "What is the number of diagnoses to includes?" }, { "question": "What is the number of diagnoses to includes?", "answer": "1", "next_question": "What is the #1 diagnosis?" }, { "question": "What is the #1 diagnosis?", "answer": "Extranodal marginal zone B cell lymphoma of MALT type", "next_question": "What is the final pathology report?" }, { "question": "What is the final pathology report?", "answer": "Stomach, endoscopic biopsy;\\n Extranodal marginal zone B cell lymphoma of MALT type",

"next_question": "" }]	"next_question": "" }],

Supplementary Table S3: Predicted CoT and Ground Truth CoT comparison for case id PIT_01_03714_01

Predicted CoT	Ground Truth CoT

[
{
"question": "What is the organ?",
"answer": "Uterine cervix",
"next_question": "Is there any abnormality present?"
},
{
"question": "What is the procedure?",
"answer": "Colposcopic biopsy",
"next_question": "Is there any abnormality present?"
},
{
"question": "Is there any abnormality present?",
"answer": "Yes, there is an abnormality.",
"next_question": "What is the number of diagnoses to includes?"
},
{
"question": "Is there any abnormality present?",
"answer": "Yes, there is an abnormality.",
"next_question": "Is there any neoplasm present?"
},
{
"question": "What is the number of diagnoses to includes?",
"answer": "1",
"next_question": "What is the #1 diagnosis?"
},
{
"question": "Is there any neoplasm present?",
"answer": "Yes, there is a neoplasm.",
"next_question": "What is the primary of neoplasm?"
},
{
"question": "Is there any neoplasm present?",
"answer": "Yes, there is a neoplasm.",
"next_question": "What is the behavior of neoplasm?"
},
{
"question": "What is the #1 diagnosis?",
"answer": "Chronic nonspecific cervicitis",
"next_question": "What is the final pathology report?"
},
{
	[
	{
	"question": "What is the organ?",
	"answer": "Uterine cervix",
	"next_question": "Is there any abnormality present?"
	},
	{
	"question": "What is the procedure?",
	"answer": "Colposcopic biopsy",
	"next_question": "Is there any abnormality present?"
	},
	{
	"question": "Is there any abnormality present?",
	"answer": "No, there is no abnormality.",
	"next_question": "What is the number of diagnoses to includes?"
	},
	{
	"question": "What is the number of diagnoses to includes?",
	"answer": "1",
	"next_question": "What is the #1 diagnosis?"
	},
	{
	"question": "What is the #1 diagnosis?",
	"answer": "Chronic nonspecific cervicitis",
	"next_question": "What is the final pathology report?"
	},
	{
	"question": "What is the final pathology report?",
	"answer": "Uterine cervix, colposcopic biopsy;\\n Chronic nonspecific cervicitis",
	"next_question": ""
	}
	],

"question": "What is the primary of neoplasm?",
"answer": "Cervical",
"next_question": "What is the histologic type of neoplasm?"
},
{
"question": "What is the behavior of neoplasm?",
"answer": "Benign",
"next_question": "What is the histologic type of neoplasm?"
},
{
"question": "What is the final pathology report?",
"answer": "Uterine cervix, colposcopic biopsy;\\n Chronic nonspecific cervicitis",
"next_question": ""
}
]	

Supplementary Table S4: Organ specific Metric-A and sub-scores on internal validation set

Organ	n-samples	BPV	MESS	Edge F1	Final Report Score	Ranking Score
Breast	441	0.0	0.594	0.708	0.805	0.682
Colon	387	0.649	0.941	0.935	0.813	0.873
Stomach	353	0.431	0.871	0.886	0.844	0.843
Prostate	291	0.333	0.599	0.702	0.803	0.699
Bladder	213	0.038	0.685	0.789	0.848	0.749
Lung	185	0.005	0.606	0.731	0.820	0.699
Cervix	165	0	0.611	0.749	0.798	0.697