

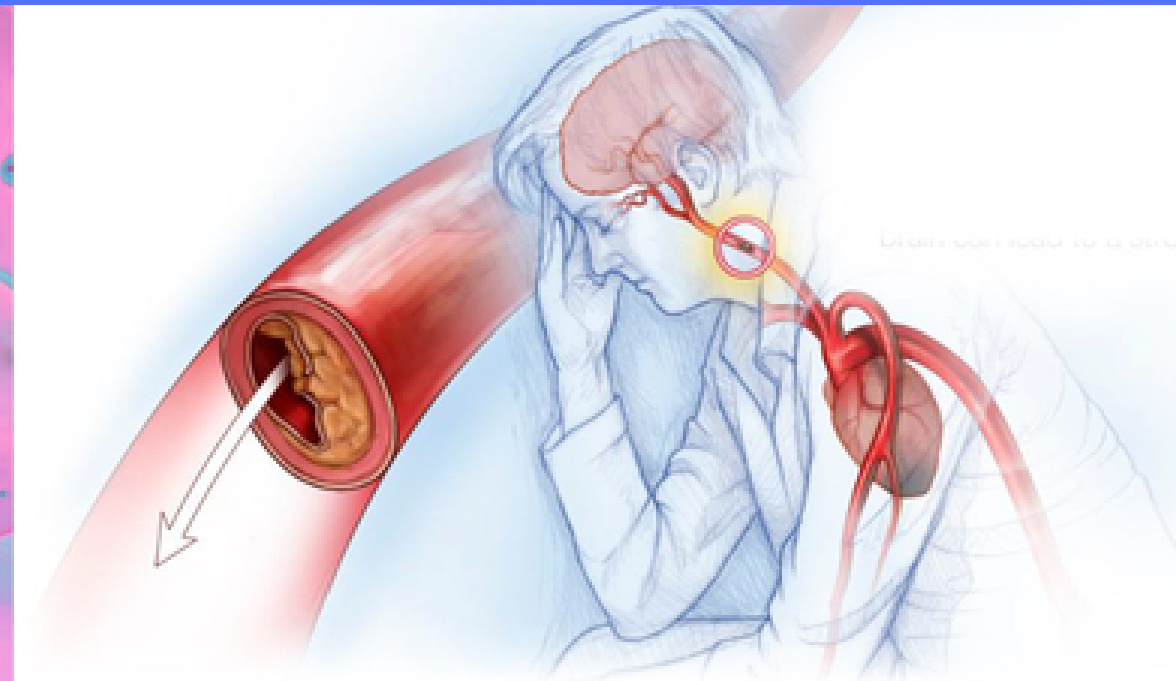
MAYO CLINIC

A decorative graphic consisting of a horizontal line extending from the left edge, followed by a diagonal line segment ending in a solid black dot.

PREDICTING STROKE ETIOLOGY FROM IMAGING OF BLOOD CLOTS

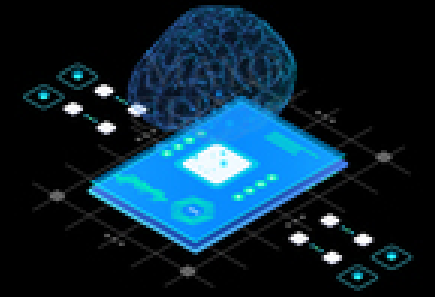
SAM OLIVER - FREELANCE DATA SCIENTIST

Abstract geometric shapes in blue and dark blue on the right side of the slide, including a large blue triangle pointing left and a dark blue triangle pointing right.



STRIP AI

STROKE THROMBOEMBOLISM REGISTRY
OF IMAGING AND PATHOLOGY



MAYO
CLINIC

- BACKGROUND
- DATA

- METHODS
- MODEL RESULTS
- THE DIAGNOSTIC TOOL

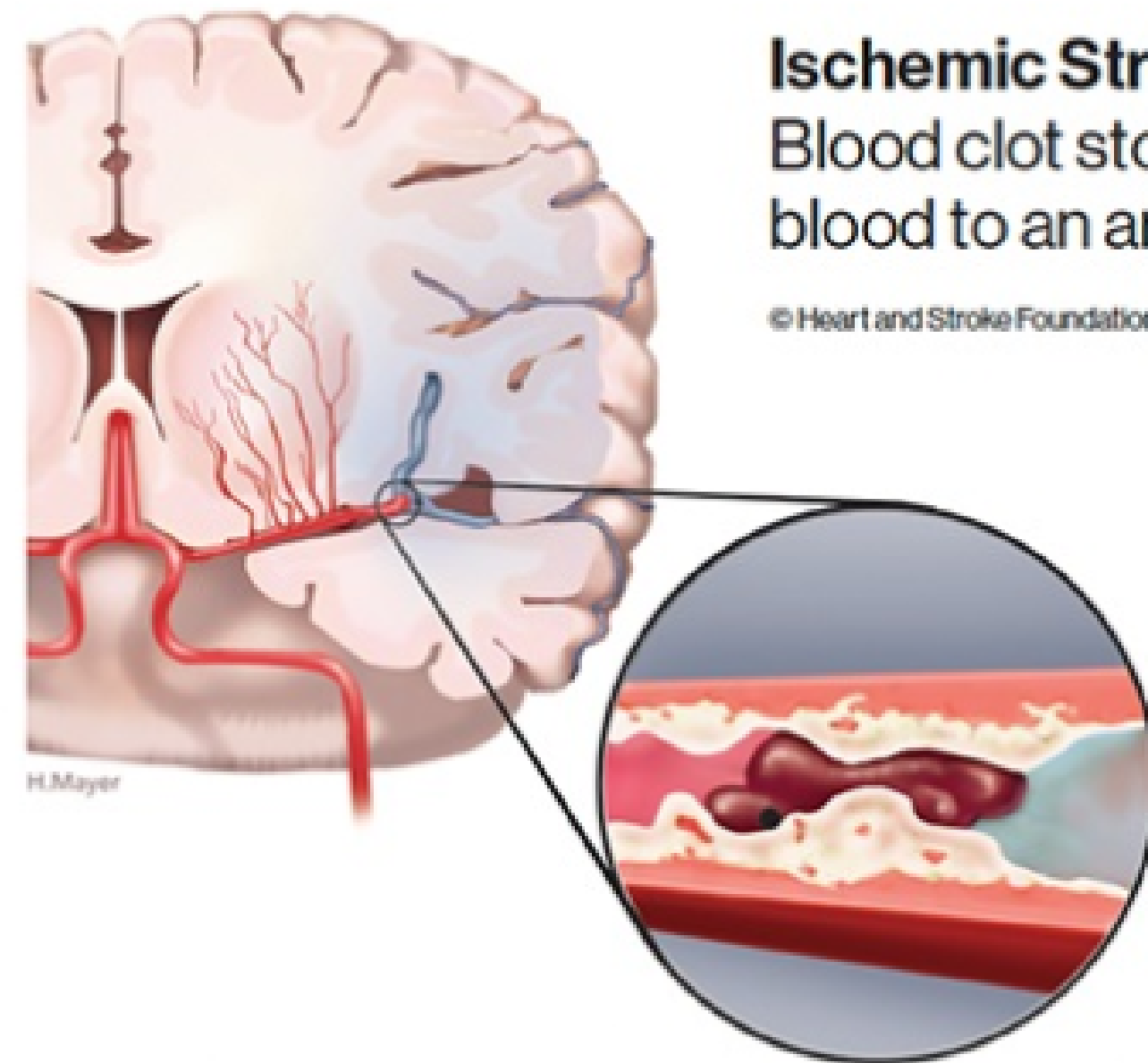
- FURTHER
RECOMMENDATIONS
- CONTACT DETAILS

BACKGROUND

- 700K STROKES / YR IN US
- MAYO CLINIC + KAGGLE

GOALS

- **PREDICT TYPE OF STROKE**
FROM EXTRACTED CLOT IMAGE
- CREATE DIAGNOSTIC TOOL TO
ASSIST THE MAYO CLINIC
WITH DIAGNOSIS OF PATIENTS



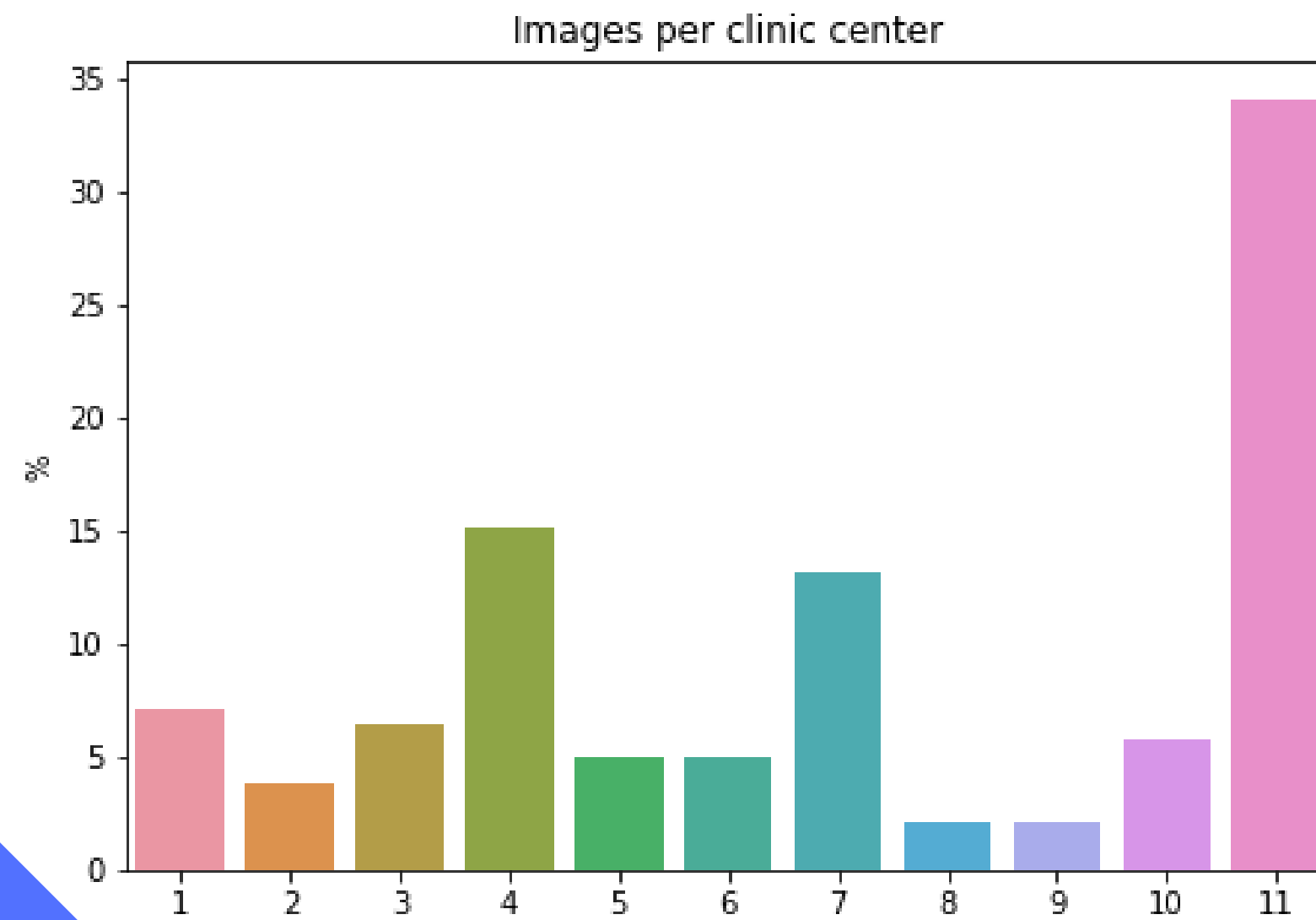
Ischemic Stroke

Blood clot stops the flow of blood to an area of the brain.

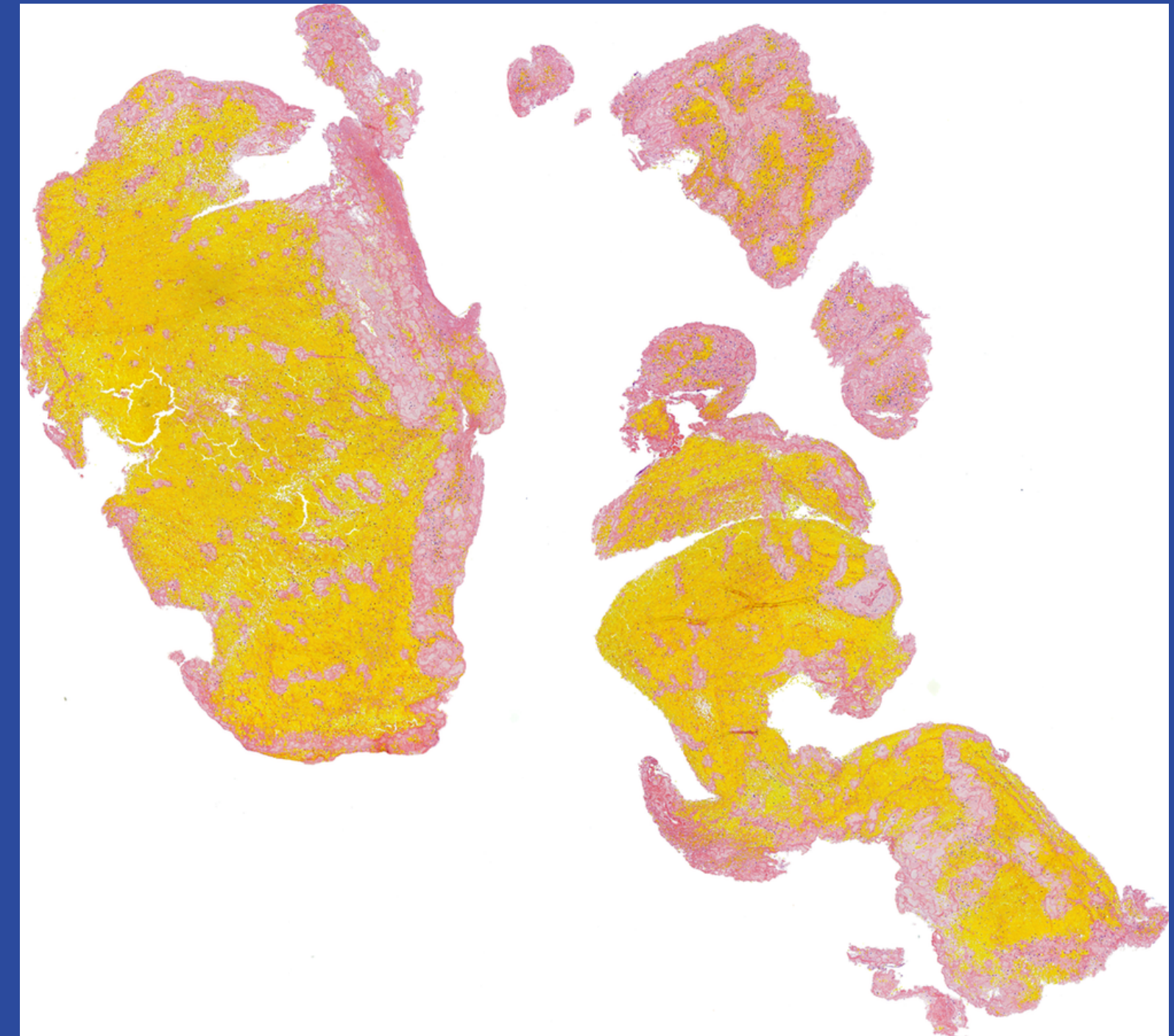
© Heart and Stroke Foundation of Canada

DATA

1,000 WHOLE SLIDE IMAGES - 400 GB



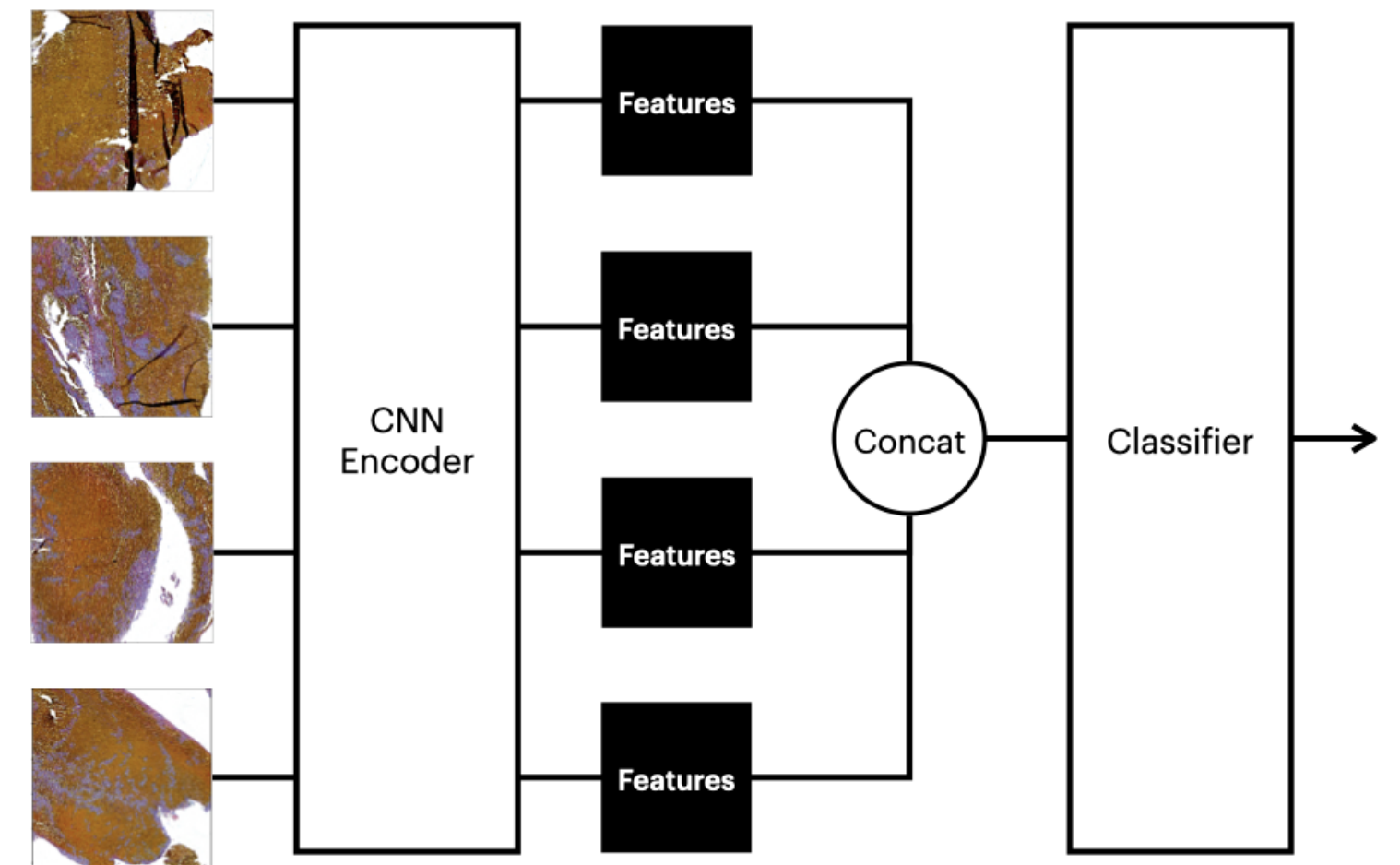
WHOLE SLIDE IMAGE OF CLOT



METHODS

- CLEAN DATASET
- HANDLE SIZE OF DATA
- MODEL THE DATA: NN & MIL
- EVALUATE & COMPARE

MIL MODELING



MODEL RESULTS

LOSS SCORES:

- **IMPROVEMENT FROM BASELINE TO BEST**

BASLINE	BEST
0.663	0.604



THE DIAGNOSTIC TOOL

1

CREATES DIAGNOSTIC PREDICTION

Automatic diagnosis given

2

READS IN NEW WHOLE SLIDE IMAGES

Processes data and refines algorithm

3

OPTIMIZED FOR ADDITIONAL DATA

Processes biomarkers and mass spectrometry readings



Further Recommendations

- 1 EXPAND COMPUTATIONAL RESOURCES
- 2 MORE DATA: BIOMARKERS + MASS SPECTROMETRY READINGS
- 3 EXPLORE OTHER SOLUTIONS:
PREVENTATIVE HEALTHCARE
PREDICT RISK + RECOMMEND SCREENING

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<https://github.com/samoliver3>

