The Journey to AI Precision Diagnostics and the Impact on Patient Outcomes

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CEO

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PUERTO RICO Health & Insurance CONFERENCE 2021

CORE PLUS

SERVICIOS CLINICOS Y PATOLOGICOS

- High complexity, CLIA certified laboratory
  - Anatomic Pathology
  - Cytopathology
  - Molecular
  - Clinical
- Established in 1996
- Located in Carolina & Ponce
- Island-wide services

- Healthcare IT Solutions
  - Consulting
  - Support
  - Development
  - Business Intelligence
- Established in 2014
- Healthcare IT Solutions
- Located in Carolina

Industry Challenges

40%
≥ 63 y/o

2021
Expected retirement apex

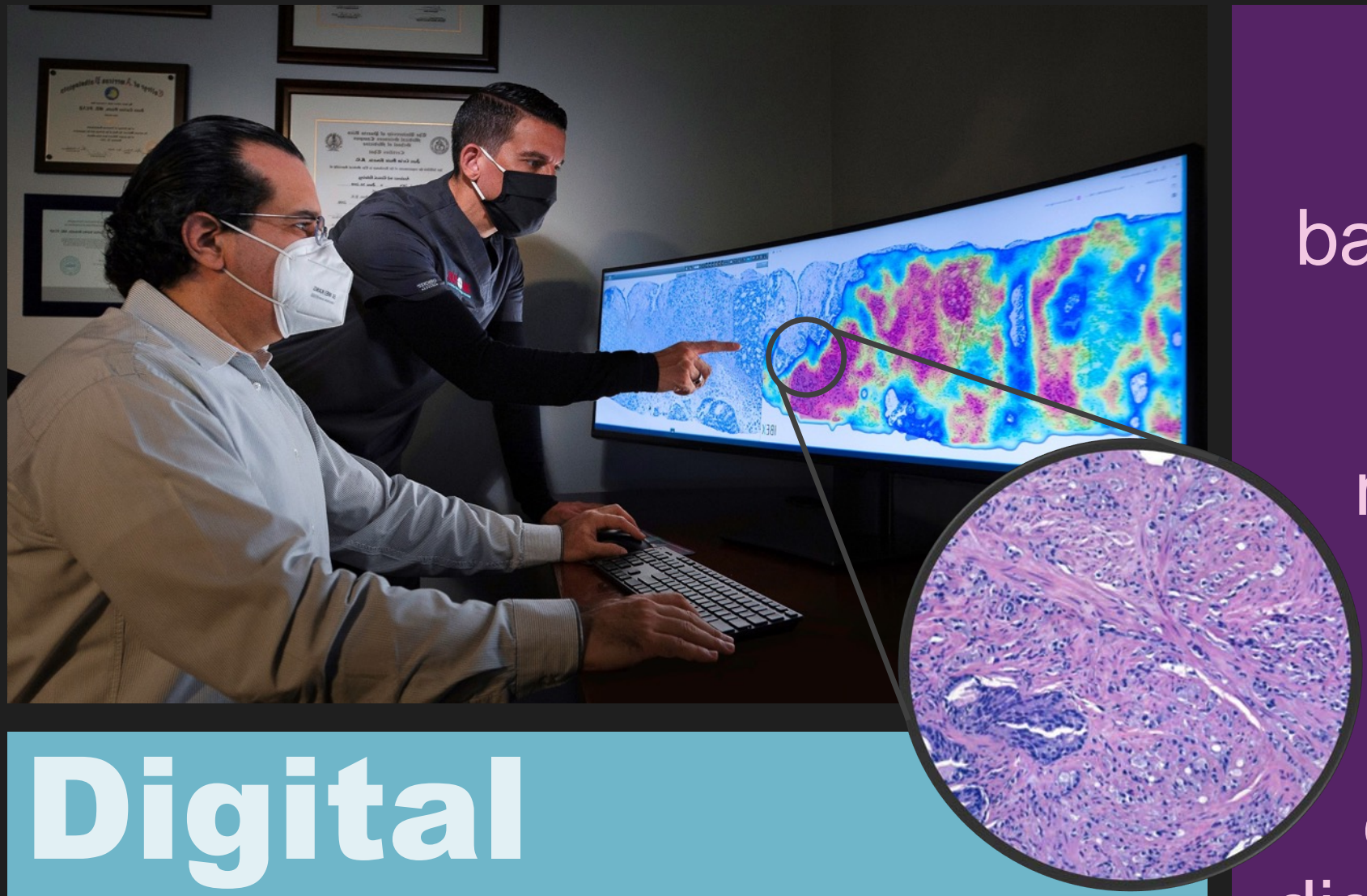
>5700
Professional shortage

Positivity rate on the rise
In **42%** between 2007 – 2017

https://www.fiercehealthcare.com/hospitals-health-systems/industry-voices-shortage-invisible-doctors#:~:text=In%20a%202013%20study%2C%20researchers,short%20more%20than%205%2C700%20pathologists.

CORE PLUS
SERVICIOS CLINICOS Y PATOLOGICOS

SYNDEO

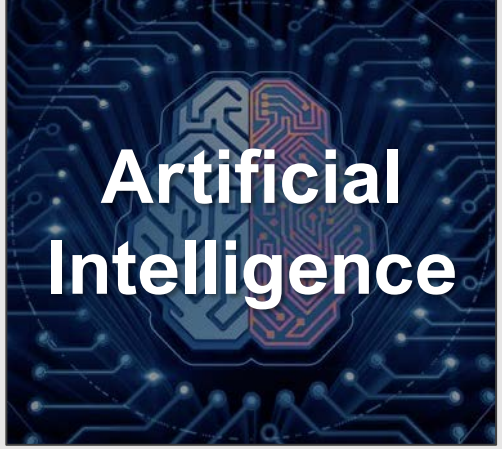


Digital Pathology

Dynamic, image-based environment that enables the acquisition, management and interpretation of pathology information generated from a digitized glass slide.

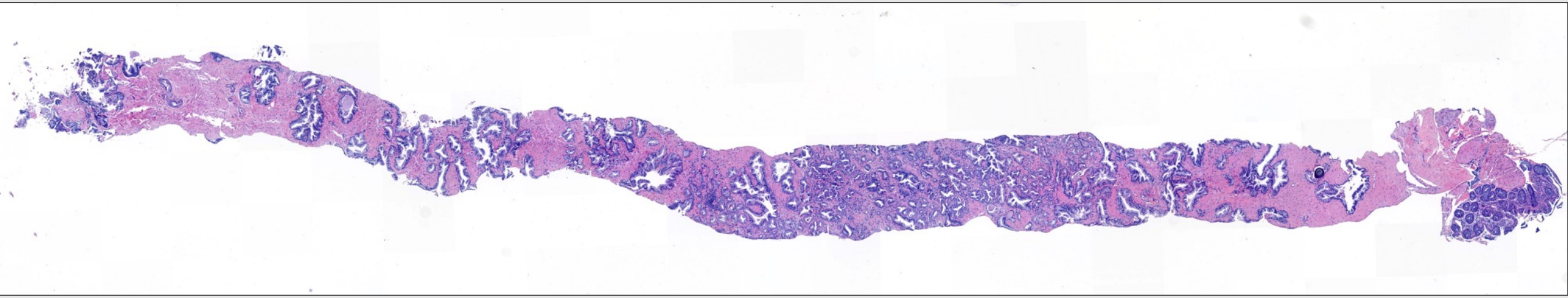
https://digitalpathologyassociation.org/about-digital-pathology


Diagnosis
Automation

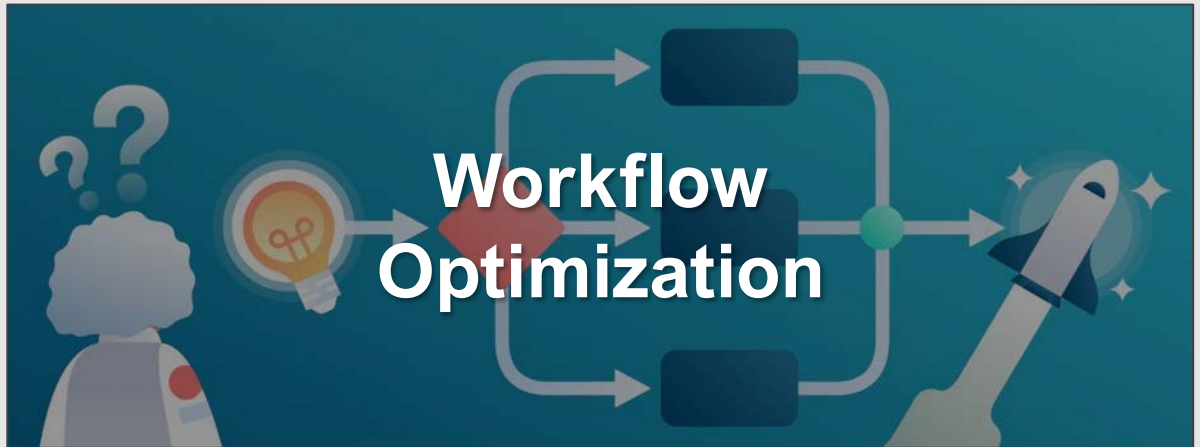

Artificial
Intelligence


Distribution


Load
Balancing




Decoupling


Workflow
Optimization

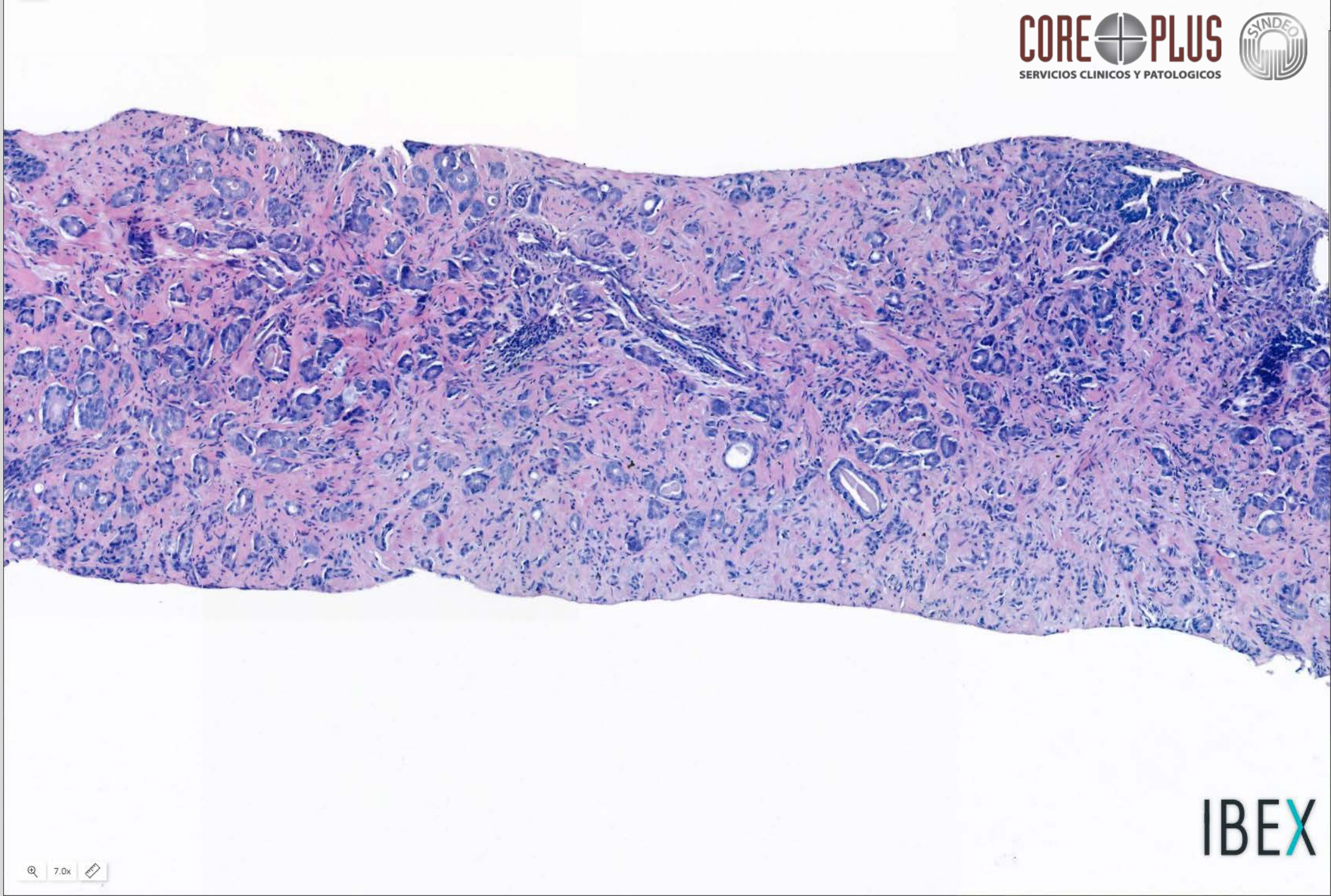

Data
Mining

The Results are In!

	Area Under the Curve	SPEC	SENS	# SLIDES
 CORE PLUS SERVICIOS CLINICOS Y PATOLOGICOS	**0.994**	**96.9%**	**96.5%**	**1,019**
 MEDIPATH Médecins pathologistes indépendants	0.99	97%	99%	1,142
 UPMC LIFE CHANGING MEDICINE	0.99	98.5%	97%%	1,627
 Maccabi Healthcare Services	0.99	96%	98%	3,466

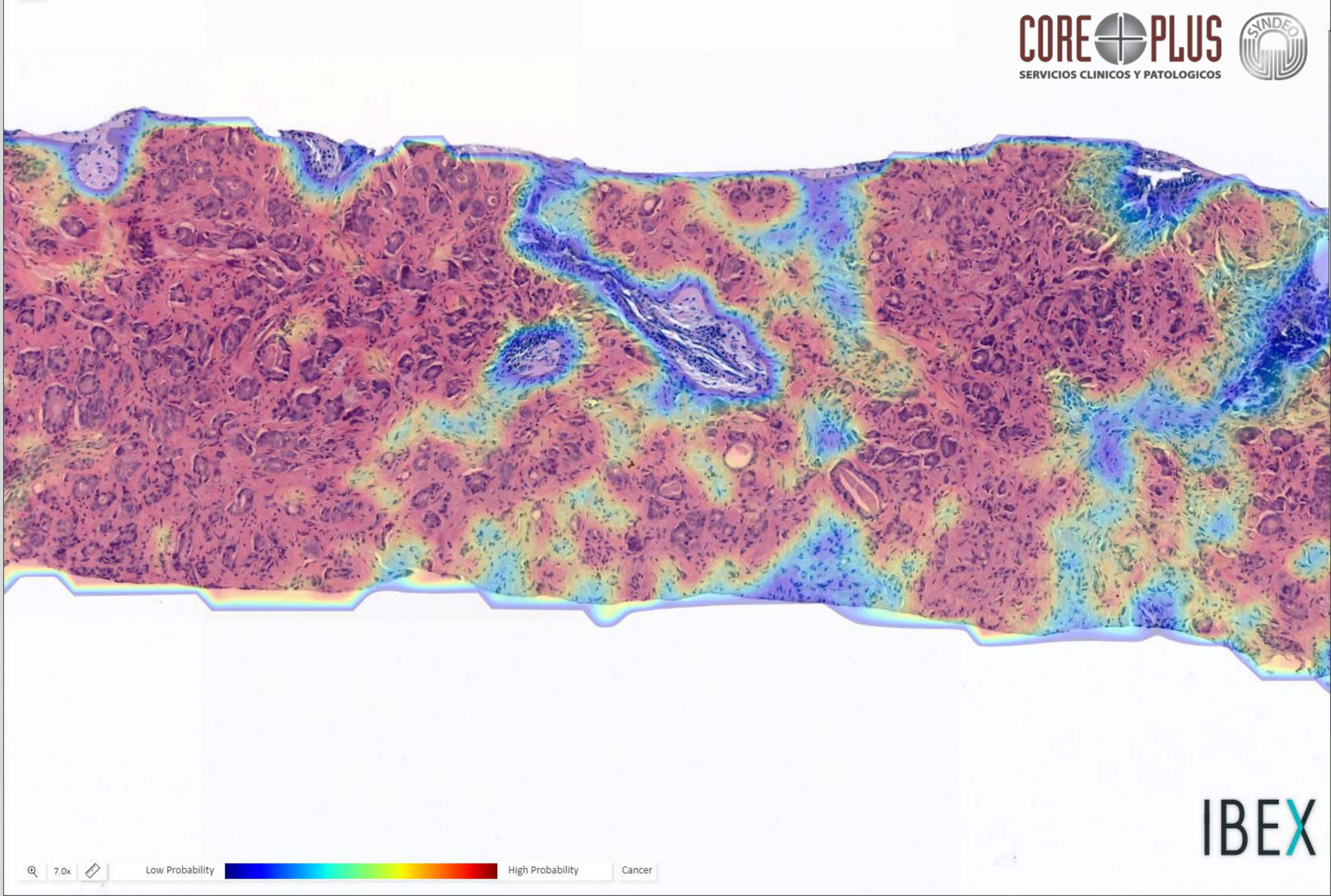
CASE 1

- 66 y/o male
- Elevated PSA
- Family Hx of Prostate Cancer



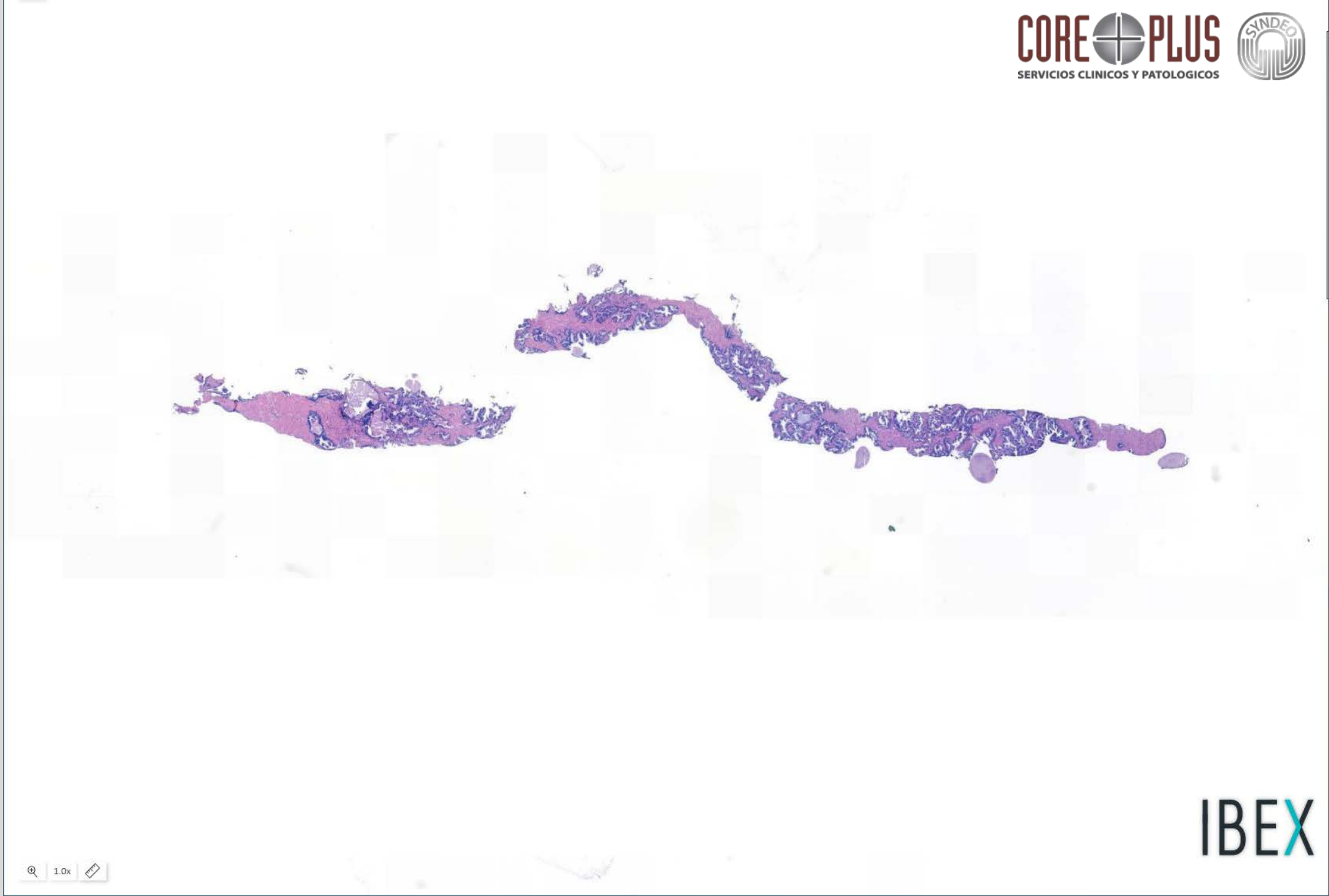
CASE 1

- 66 y/o male
- Elevated PSA
- Family Hx of Prostate Cancer
- Dx = Prostate Adenocarcinoma Grade Group 2



CASE 2

- 51 y/o male
- Slightly Elevated PSA



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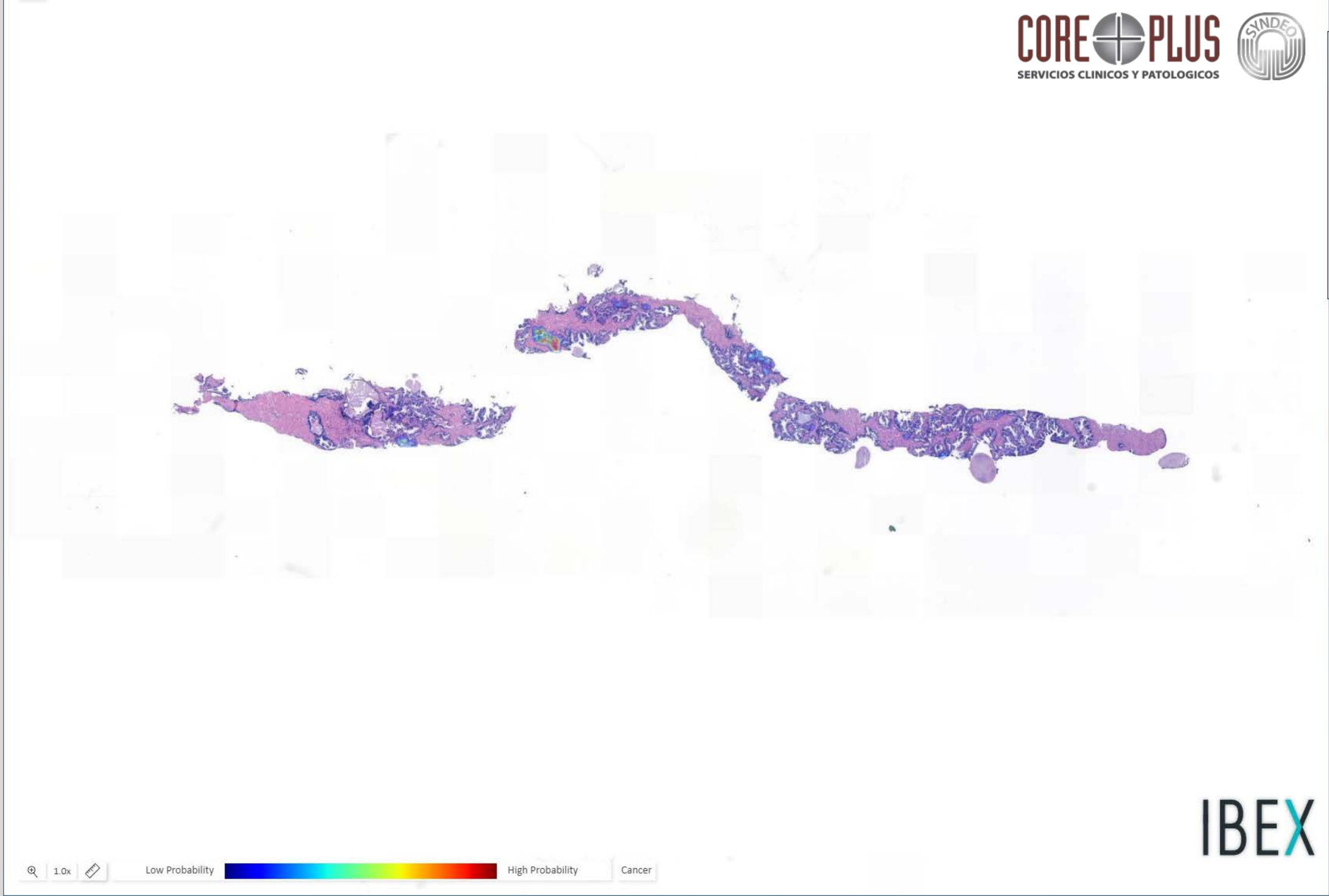
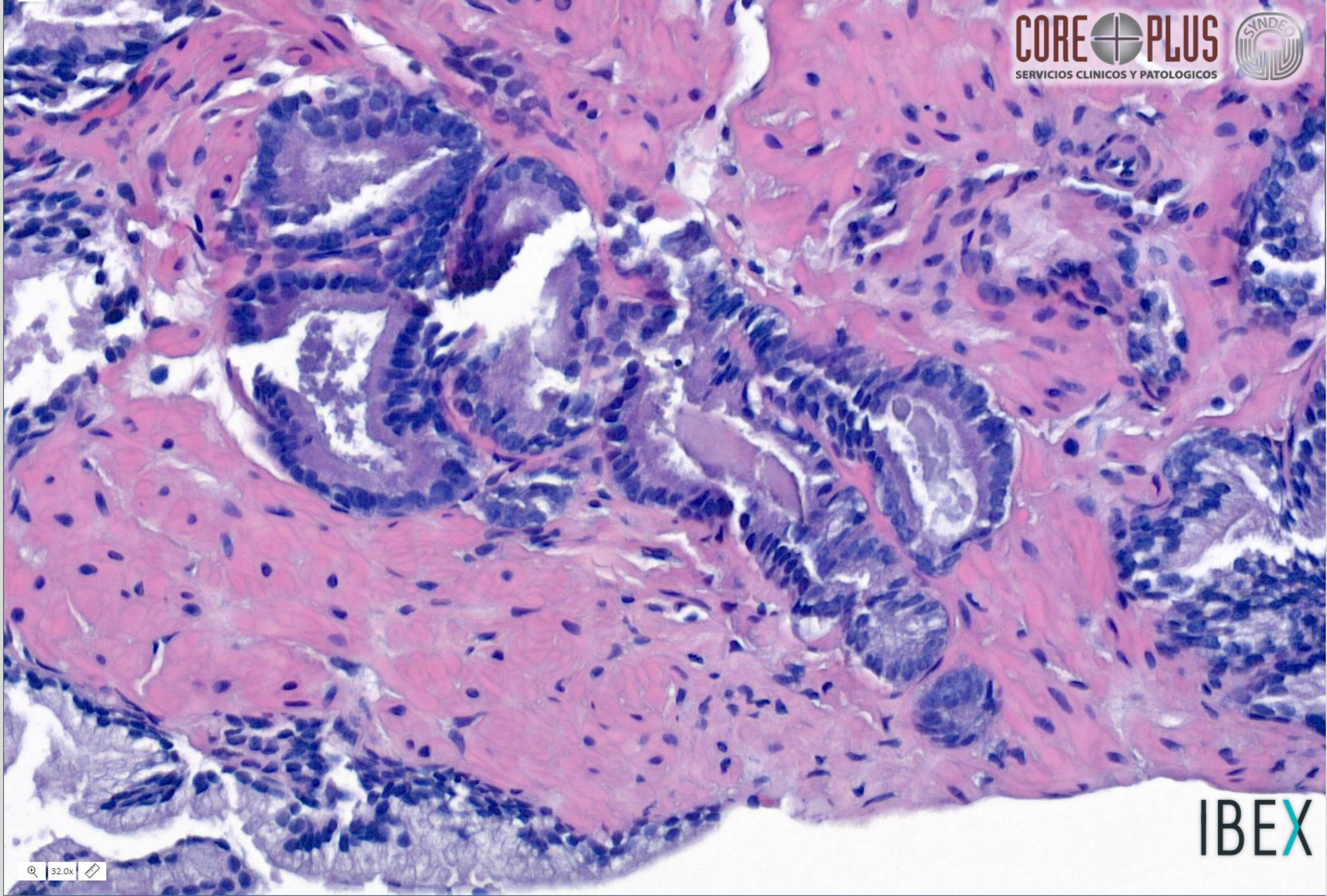


CASE 2

- 51 y/o male
- Slightly Elevated PSA
- Dx = Microfocus of Prostate Adenocarcinoma Grade Group 1

Measurement

0.3mm



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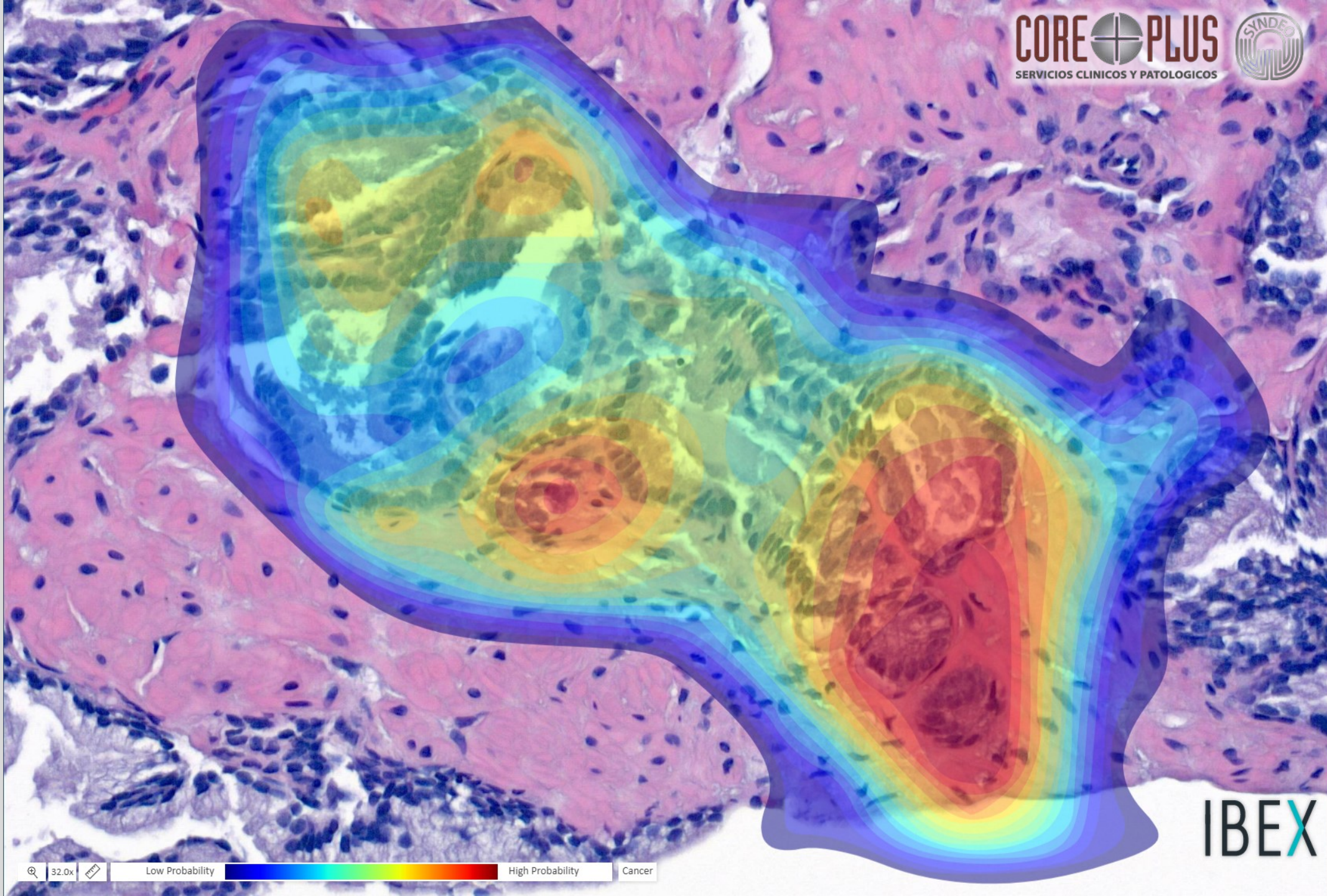
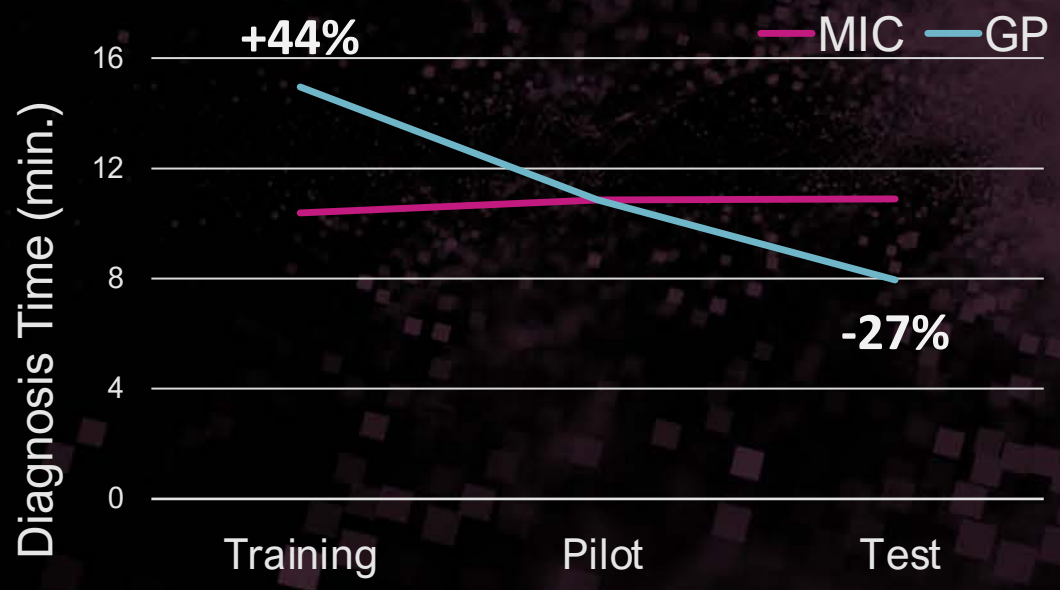


27% shorter diagnosis time with AI compared to a microscope!

AVERAGE DIAGNOSIS TIME



Efficiency % was calculated as a ratio of GP to MIC diagnosis time
MIC – diagnosis by pathologist using the microscope
GP – diagnosis by pathologist using Galen Prostate

EFFICIENCY GAINS IN STUDY TEST

Diagnosis	# Cases	Time (GP vs. MIC)
Benign	34	-32%
Cancer	85	-25%

- Diagnosis time was 27% shorter
- Efficiency gains were slightly higher for benign cases than for cancer cases

https://www.linkedin.com/posts/ibexmedicalanalytics_uscap2021-pathology-digitalpathology-activity-6777598575074410496-Ko8d

The Power of AI in Pathology

Automate labor-intensive or mundane processes

- Increase **efficiency** and **repeatability**
  - Count mitoses
  - Segment glands
  - Characterize nuclei shape

Augment pathologist

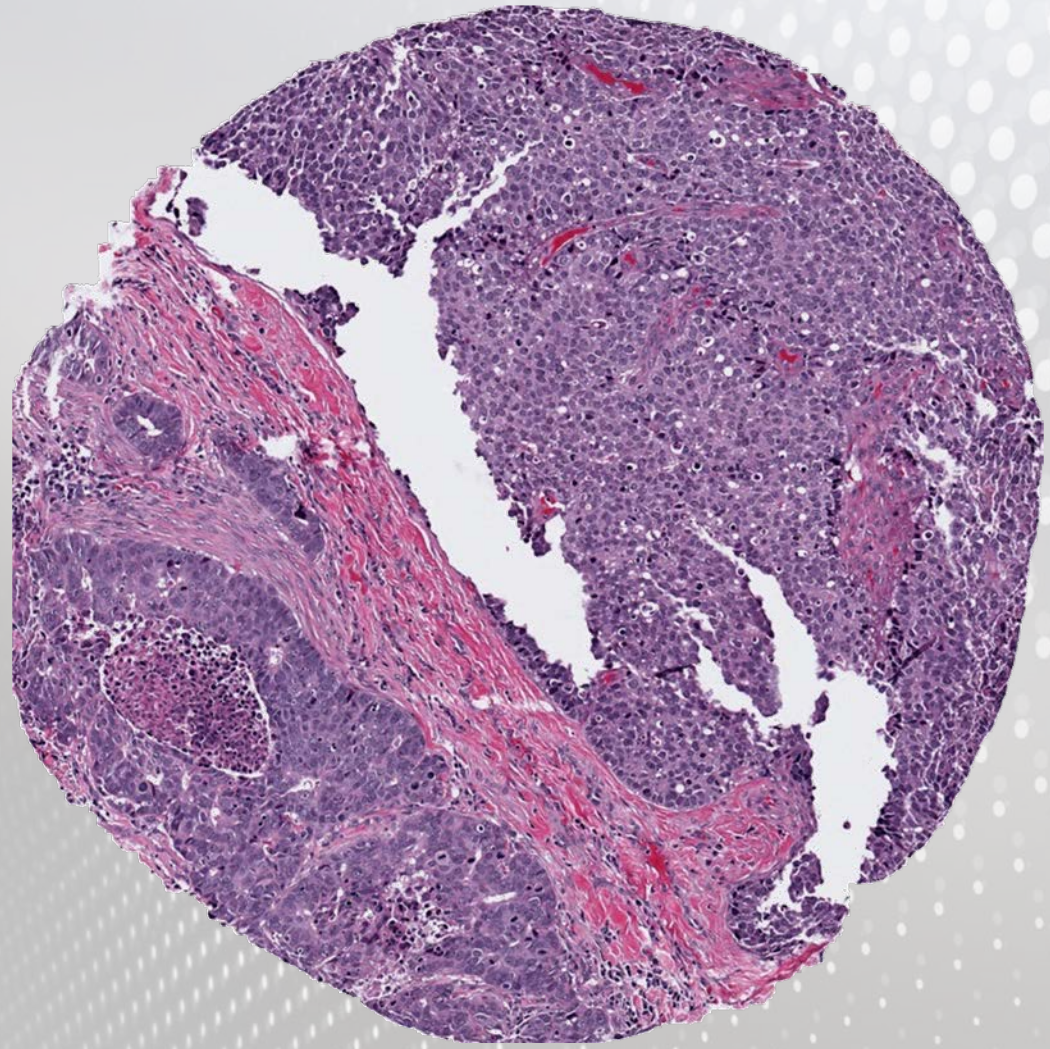
- Improve **precision** and **productivity**
  - Find tumor in image
  - Predict one imaging modality or stain from another

Innovate to learn concepts beyond human capabilities

- Discover **new insights** and **drive impact**
  - Distinguish classes too complex for human experts
  - Infer molecular biomarkers from H&E
  - Predict patient outcome

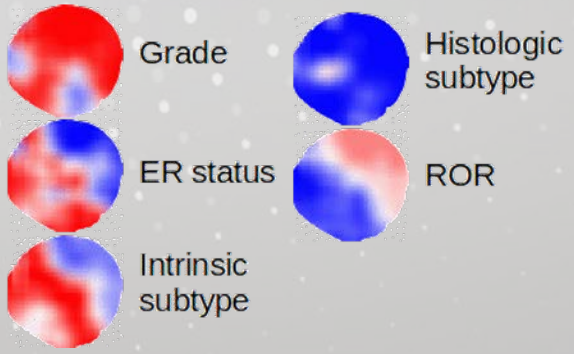
https://pixelscientia.com/pathology.html

Computer-Extracted Features



AI to Predict Breast Cancer Grade, ER status, Histologic and intrinsic subtypes

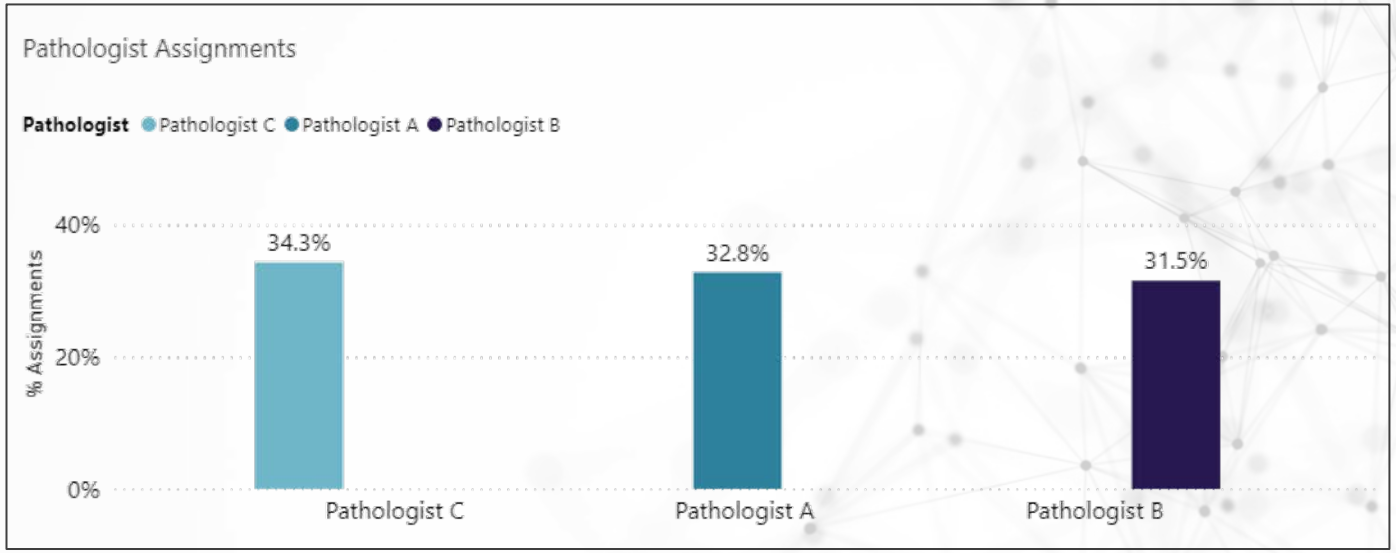
75 – 85% accuracy predicting ER status, RNA-based molecular subtype and risk of recurrence score.

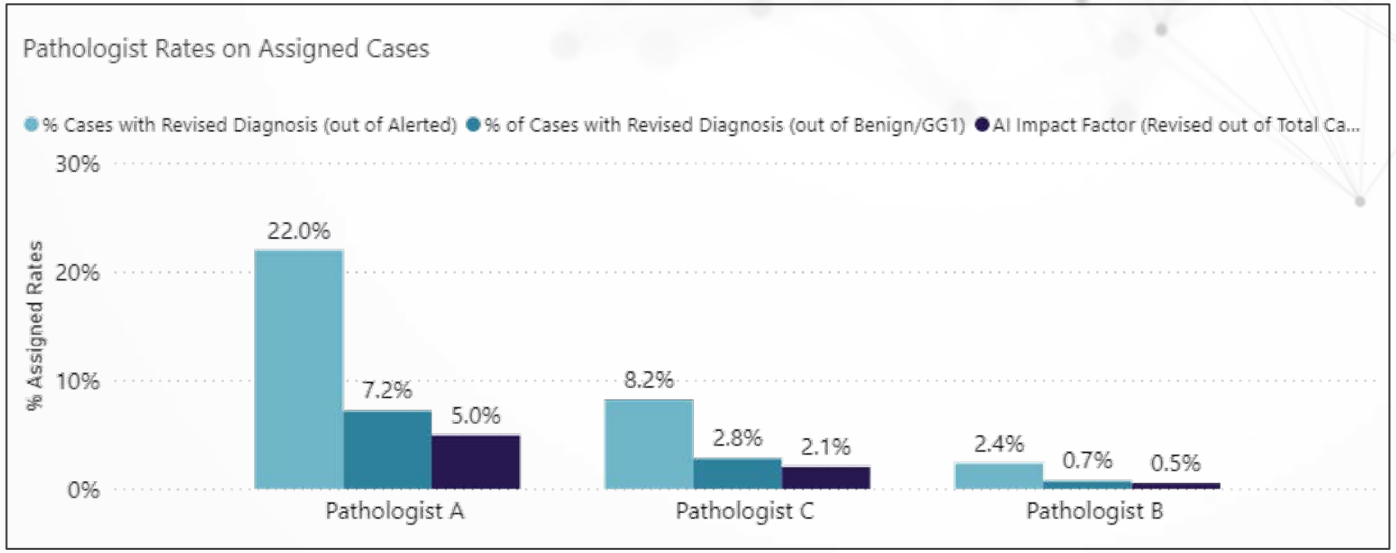


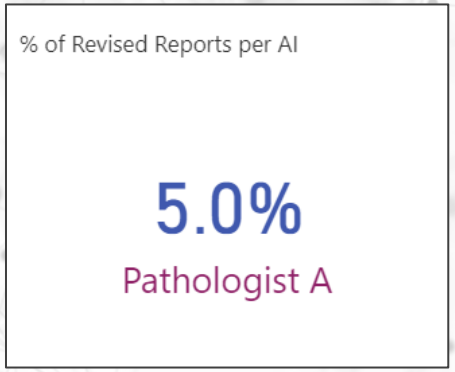
https://pixelscientia.com/pub/Couture-npjBreast2018.pdf

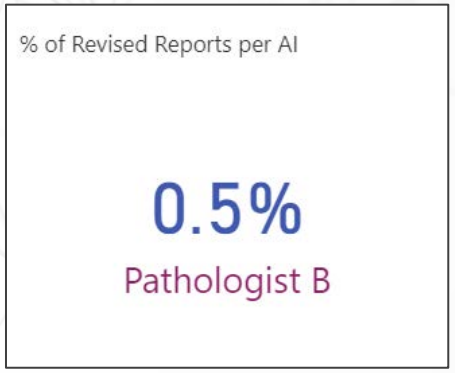
Conclusion

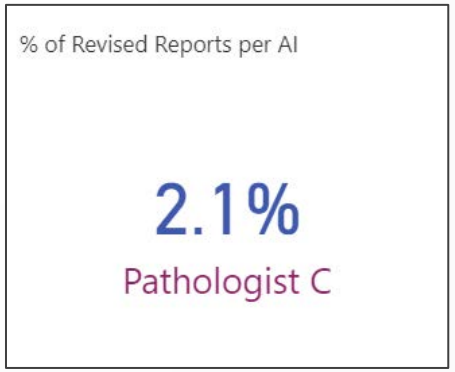
AI-Assisted Diagnosis by Pathologist









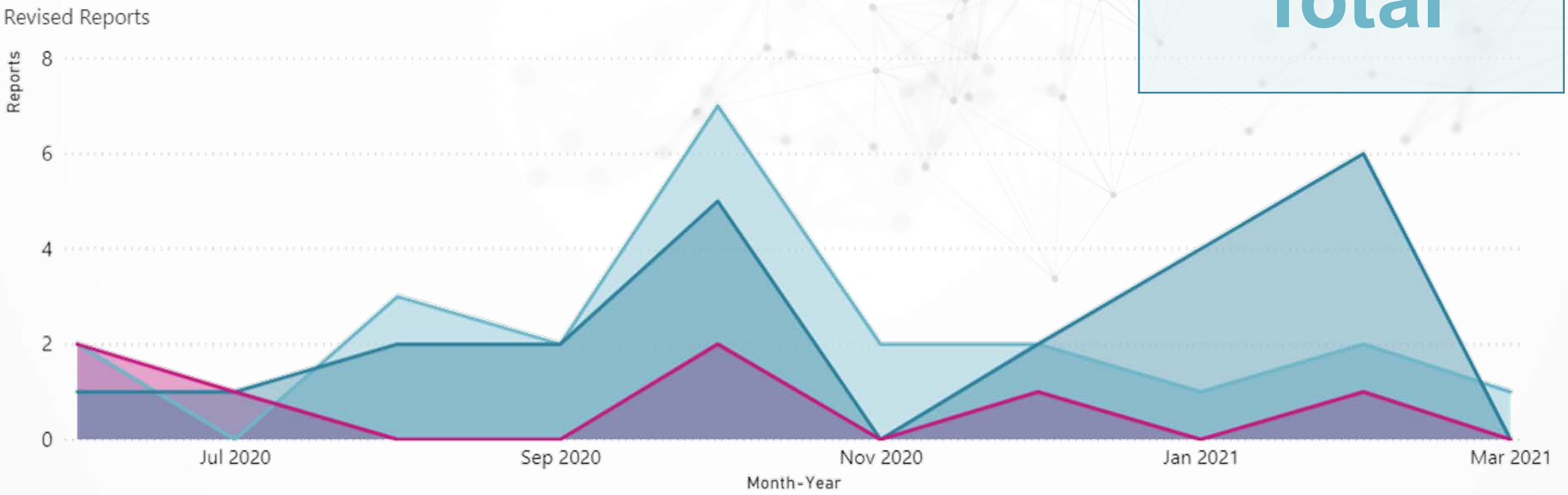


AI-Assisted Diagnosis

	Benign -> Adenocarcinoma	21
	Benign -> ASAP	23
	G6 -> G7	7

2.3%

Total



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Thank You!