

Ditch the Patient Questionnaire

How Imaging AI Could Redefine Risk Assessment in Breast Cancer Screening



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Guest Speakers



Dr. Chirag Parghi



Dr. Niccolò Stefani

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Agenda

Introduction of the clinical problem
and current evidence

Description of technology, market
context, and future pathways

Conclusion and Q&A



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Disclosures

Off-Label and Investigational Use:

This presentation discusses emerging and investigational applications of artificial intelligence for breast cancer risk assessment, including potential use in risk-adapted screening and prevention pathways. Some technologies, features, or clinical applications discussed may not be authorized or commercially available in all countries and may fall outside their currently authorized intended use. Discussion is for educational purposes and does not constitute a recommendation for clinical use.



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Learning Objectives

1. Compare the inputs, intended uses, strengths, and limitations of established breast cancer risk models.
2. Evaluate current evidence for mammography-based AI risk prediction, including discrimination, calibration, time horizon, and generalizability.
3. Describe how image-derived risk assessment could inform risk-adapted screening while recognizing unresolved implementation, equity, regulatory, and patient-management questions.



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Opening Audience Poll

Does your practice calculate formal breast cancer risk for most screening patients?



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The Risk Assessment Paradox: Why Models that Work Rarely Reach Everyone

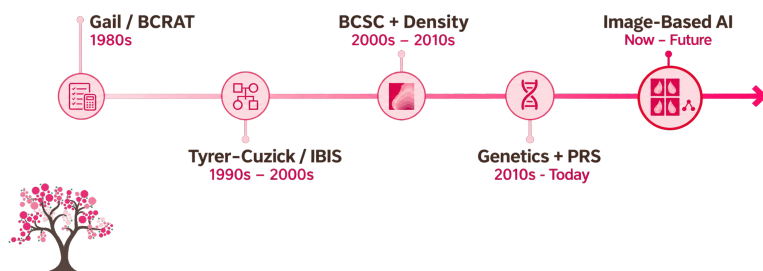
Presented by:
Dr. Chirag Parghi



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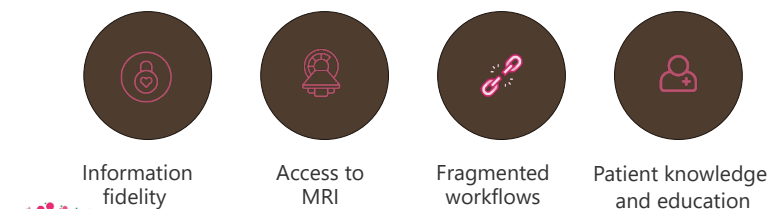
Evolution of breast cancer risk models



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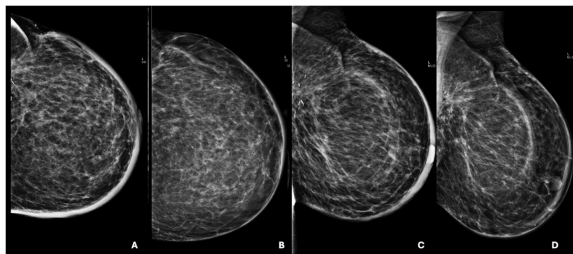
Barriers to systematic adoption



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Barriers to systematic adoption



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This is globally problematic

A fragmented risk-assessment pathway

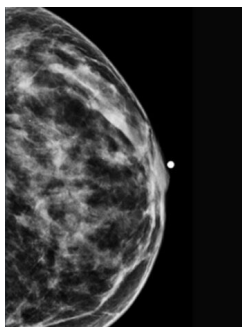
- Geographic variation and inconsistent entry points across population
- Dependence on women or clinicians to recognize family-history concerns
- Support for standardized, proactive, digitally-enabled pathways



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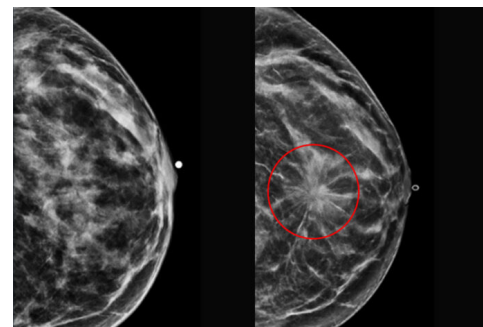
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Mammography
as a
biomarker



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2 years later...



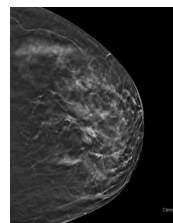
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“
What does high risk mean,
if I don't see signs on the mammogram?”

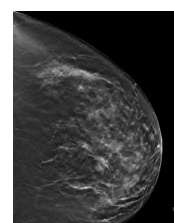


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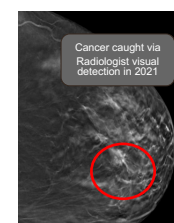
Case 1
62 year old woman consistent with screening mammograms



2019
Case Score: 47
Risk: 0.34



2020
Case Score: 58
Risk: 1.08



2021
Case Score: 78 Risk:
1.26



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2019 Results: No cancer detected | Case Score: 77 | Risk Score: High

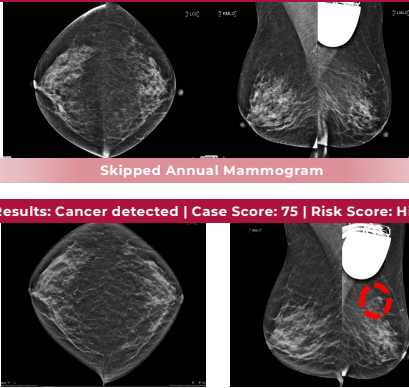
A retrospective analysis of patient's 2019 mammogram shows elevated case score and risk level

Case 2

2020 Skipped Annual Mammogram

2021 Results: Cancer detected | Case Score: 75 | Risk Score: High

If patient's elevated risk was known in 2019, annual follow-up would have been encouraged and managed. *And her cancer would have had a higher probability of being detected in 2020.*



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Opening Audience Poll

What is the approximate Area Under the Curve (AUC) for T-RISK in predicting breast cancer risk?



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From Prediction to Precision Screening: Building the Next Generation of AI Risk Technologies

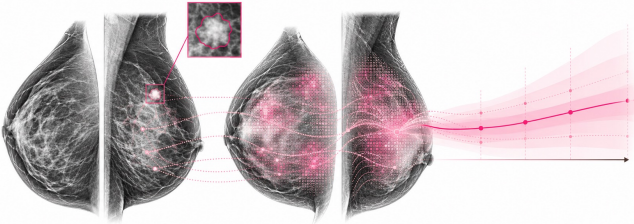
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What if... the **most valuable information in a mammogram** is not only the cancer we can see,



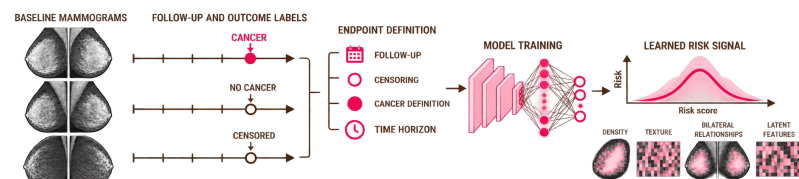
but the **future risk** we cannot?



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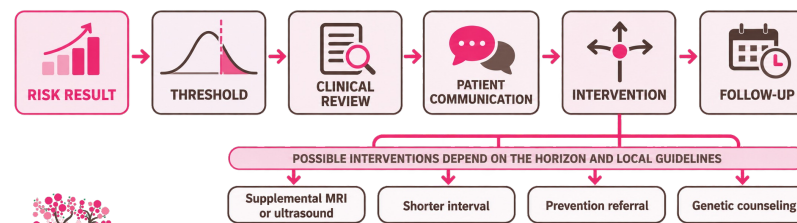
What imaging AI learns



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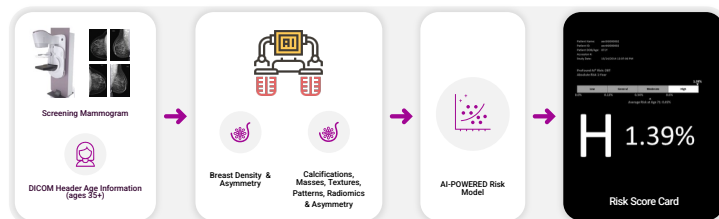
Getting from a Risk Score to a **Care Pathway**



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How AI-powered risk assessment works



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Putting AI into the test



**Karolinska
Institutet**

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Nested Case-Control Study Design

Karolinska Institutet

- 154,200 women attending DBT screening in 2014-2019**
 - Women aged 35-74 years at 4 U.S. hospitals or breast centers
 - Followed for 1-year on average (range 0.5-2.5 years) until diagnosis or next screen
 - DBT vendors: GE Healthcare, Hologic, Siemens
- 5978 women used to validate AI Risk Model for DBT**
- Cases: all 805 women diagnosed with incident breast cancer**
- Controls: random sample of 5173 women with negative or benign screens matched on year of study entry of cancer cases**
- AUC analysis to estimate discriminatory capacity of AI Risk Model for DBT**
 - Most recent prior mammograms of women who later developed breast cancer vs.
 - Mammograms of healthy women from corresponding time period

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Risk Assessment AI Performance and Comparison

Model (1-year or 2-year absolute risk)

Model (1-year or 2-year absolute risk)	AUC (95% CI)
Mammo Risk Risk with DBT (1-year risk) (Internal Validation: 239 cancers, 1550 healthy women) ²	0.80 (0.76, 0.83)
KARMA case-cohort (2-year risk) (974 cancers, 9376 healthy women) ¹	
Model 1: ProFound AI Risk with FFDm (mammographic density, microcalcifications, masses, age)	0.73 (0.71, 0.74)
Model 2: Model 1 + lifestyle and familial risk factors*	0.74 (0.72, 0.75)
Model 3: Model 2+ polygenic risk score (PRS)**	0.77 (0.75, 0.79)
PRS	0.64 (0.62, 0.66)
PRS + mammographic density	0.67 (0.65, 0.69)
Tyrer-Cuzick	0.58 (0.56, 0.60)
Tyrer-Cuzick + mammographic density	0.62 (0.60, 0.64)
Gail	0.56 (0.54, 0.58)
Gail + mammographic density	0.61 (0.60, 0.63)

+7% vs Mammo Risk for FFDm

+18% vs TCv8

* Lifestyle and familial risk factors included: BMI, menopausal status, current use of hormone replacement therapy, tobacco use, alcohol use, and family history of breast cancer.
** Polygenic risk score (PRS) based on 313 single nucleotide polymorphisms (SNPs) using Illumina OneKArray.

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Risk Model Comparison of Effectiveness

Effectiveness comparison of Mammo Risk with DBT, FFDm and TCv8

• Approximately 12% of women have ≥ 20% lifetime risk with Tyrer-Cuzick v8
• About twice as many women will have breast cancer occur in the next year in the 12% highest risk women identified with ProFound AI Risk with DBT (47% of cancers) compared to Tyrer-Cuzick v8 (24% of cancers)

Women at Highest Risk (Percentile)	Mammo Risk with DBT AUC 0.80 Risk Cancers (%)*	Mammo Risk with FFDm AUC 0.73 Risk Women at Highest Risk (Percentile)*	Tyrer-Cuzick w/ Density (TCv8) AUC 0.62 Risk Cancers (%)*
5	31	21	12
10	44	34	20
12	47	39	24
15	55	44	29
20	64	54	34

On average*, within the 12% of women with highest risk from each model

- 47% of cancers that will occur in next year are included with Mammo Risk with DBT
- 39% of cancers that will occur in next year are included with Mammo Risk with FFDm
- 24% of cancers that will occur in next year are included with Tyrer-Cuzick v8

*Average with current guidelines' thresholds: variations per vendor and population may occur

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Mammography as a broader health signal

BREAST CANCER DETECTION + FUTURE RISK

BREAST ARTERIAL CALCIFICATION → CARDIOVASCULAR RISK SIGNAL

ONE EXAM • TWO SIGNALS

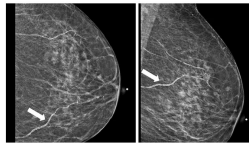
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Key US Market Trends

New mammogram policy: Maryland to require BAC notifications with first law of its kind

Hannah Murphy | April 17, 2026 | Radiology Business | Legal News



Arrows illustrate breast arterial calcifications for a 65-year-old woman on a screening mammography image (mediolateral oblique and craniocaudal views). Images and caption courtesy of Clinical Imaging.

Introduction of
new policies

Reimbursement Pathways

••1138T	Breast malignancy risk score, 5-year prediction, derived by augmentative algorithmic analysis of a screening mammogram dataset acquired in same session, with submitted result 5.1st separately in addition to code for primary procedure	October 2, 2026	January 1, 2027	CPT® 2028
••1138T	Noninvasive identification of ST elevation myocardial infarction (STEMI), STEMI equivalents, and acute or subacute myocardial ischemia, detected by ensemble algorithmic analysis of electrocardiogram previously performed for suspicion of acute coronary syndrome (List separately in addition to code for primary procedure)	October 2, 2026	January 1, 2027	CPT® 2028



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What path now?



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Closing Takeaways

1. Established models remain valuable, but systematic delivery is uneven.
2. Mammography-derived AI could make risk assessment more routine with less data-collection burden.
3. Clinical value depends on calibrated predictions, defined pathways, equitable access, and outcome evidence.



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