

*BREAST DENSITY & ITS IMPACT ON  
MAMMOGRAPHIC INTERPRETATION*



C30





# *OBJECTIVES:*



- IDENTIFY THE DIFFERENT TYPES OF BREAST DENSITIES
- EXPLAIN WHY KNOWING BREAST DENSITIES IS IMPORTANT AS A TECHNOLOGIST
- DESCRIBE OTHER IMAGING MODALITIES THAT ARE USEFUL FOR IMAGING DENSE BREASTS
- LIST THE TECHNOLOGIST'S ROLE IN IMAGING DENSE BREASTS



# WHAT IS BREAST DENSITY ?

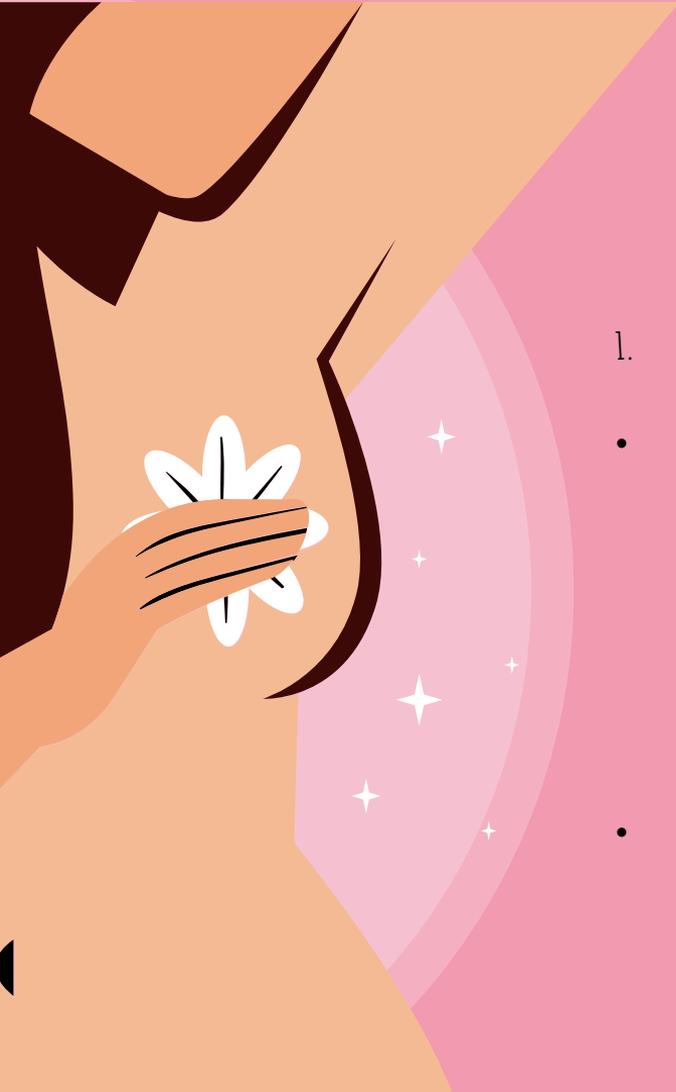
BREAST DENSITY IS A TERM TO DESCRIBE THE COMPOSITION OF A BREAST. IN OTHER WORDS, IT IS A RATIO OF GLANDULAR AND FIBROUS TISSUE, TO FATTY TISSUE IN A WOMAN'S BREASTS .

➤ THE BREAST CONTAINS 3 DIFFERENT TYPES OF TISSUE:

- FIBROUS TISSUE
- GLANDULAR TISSUE
- FATTY/ADIPOSE TISSUE



DENSE BREAST TISSUE APPEARS WHITE, WHEREAS FATTY BREAST TISSUE APPEARS DARKER OR BLACK

An illustration of a pregnant woman's profile in shades of orange and brown. Her hand is resting on her belly, which is decorated with a white flower. The background is a soft pink with a circular glow and small white stars.

## DEEPER DIVE INTO TISSUE TYPES

1. **FIBROUS TISSUE :**
  - IS A CONNECTIVE TISSUE THAT PROTECTS AND HOLDS YOUR MUSCLES AND TISSUES IN PLACE. IT IS ALSO THE SAME KIND OF TISSUE THAT MAKES UP THE LIGAMENTS IN OUR BODIES.
  - IT APPEARS WHITE ON A MAMMOGRAM BECAUSE IT IS DENSE AND HARDER TO SEE THROUGH (CAMPBELL, 2025).

An illustration of a pregnant woman's torso and hand resting on her belly. The woman is wearing a dark brown top. Her hand is resting on her belly, which is highlighted with a white starburst and several small white stars. The background is a soft pink color.

## DEEPER DIVE INTO TISSUE TYPES

### 2. GLANDULAR TISSUE:

- CONSISTS OF THE LOBES, LOBULES, AND DUCTS IN THE BREAST THAT PRODUCE (LOBES & LOBULES) AND CARRY (DUCTS) THE MILK TO THE NIPPLE.
- SIMILAR TO FIBROUS TISSUE, IT IS DENSE, SO WILL ALSO SHOW UP WHITE ON A MAMMOGRAM (CAMPBELL, 2025).

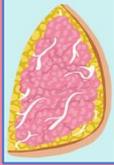
An illustration of a pregnant woman's profile in shades of orange and brown. Her hand is resting on her belly, which is adorned with a white flower. The background is a soft pink with a circular glow and small white stars.

## DEEPER DIVE INTO TISSUE TYPES

### 3. FATTY/ADIPOSE TISSUE :

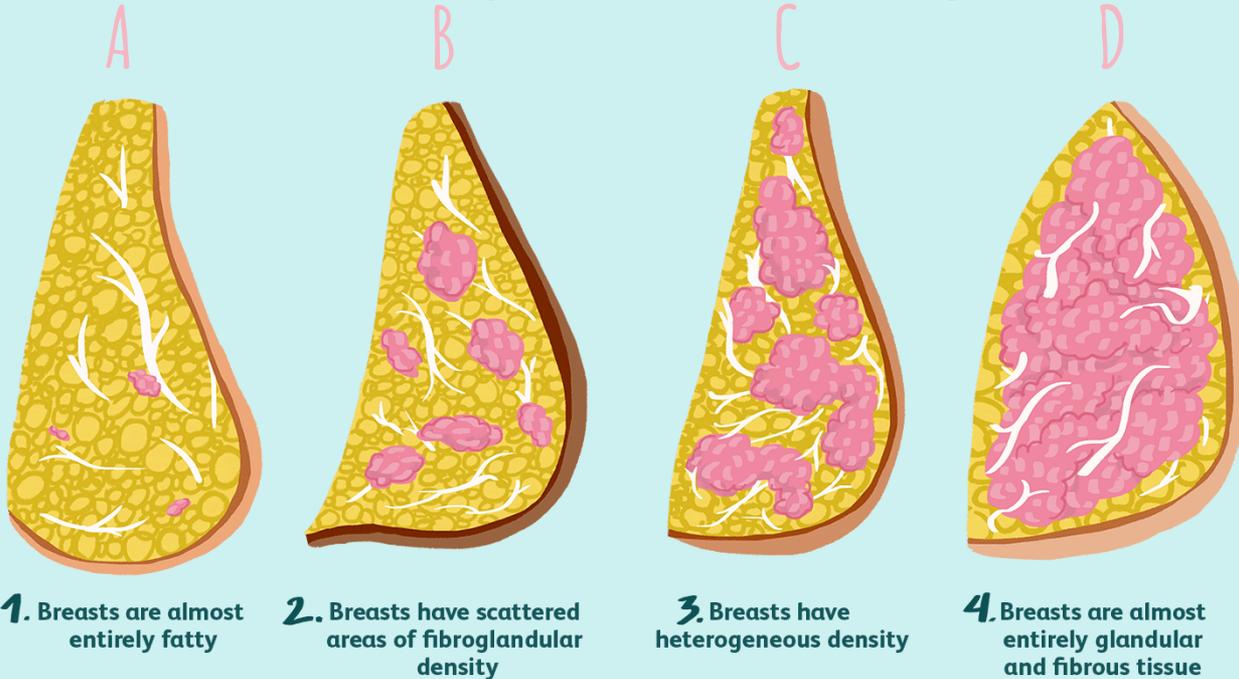
- IS JUST AS IT SOUNDS, IT IS TISSUE THAT LIES BETWEEN THE FIBROUS AND GLANDULAR TISSUE. FATTY TISSUE IS NOT DENSE, AND SHOWS UP DARKER ON A MAMMOGRAM.
- THIS MAKES IT EASIER FOR RADIOLOGIST TO DETECT CANCERS (CAMPBELL, 2025).

# DIFFERENT CATEGORIES OF BREAST DENSITY

CATEGORY	WHAT IT MEANS	VISUAL
A	THE BREASTS ARE ALMOST ENTIRELY FATTY	
B	THERE ARE SCATTERED AREAS OF FIBROGLANDULAR DENSITY	
C	THE BREASTS ARE HETEROGENEOUSLY DENSE	
D	THE BREASTS ARE EXTREMELY DENSE,	

Note: From *Dense Breasts and Breast Cancer*, by Campbell, 2025, <https://www.verywellhealth.com/dense-breasts-430657>

## Four Categories of Breast Density



Note: From *Dense Breasts and Breast Cancer*, by Campbell, 2025, <https://www.verywellhealth.com/dense-breasts-430657>

# FACTORS THAT CAN AFFECT BREAST DENSITY:

- **AGE:** BREAST TISSUE IS NATURALLY DENSER WHEN WOMEN ARE IN THEIR 20S OR 30S. AS YOU GET OLDER, THE TISSUE BECOMES LESS DENSE.
- **BODY WEIGHT:** PEOPLE WHO HAVE A LOW BMI (BODY MASS INDEX) COULD BE MORE LIKELY TO HAVE DENSER BREAST TISSUE.
- **FAMILY HISTORY:** HAVING DENSE BREASTS IS OFTEN AN INHERITED TRAIT, BUT NOT ALWAYS.
- **MEDICATIONS:** SOME MEDICATIONS OR TREATMENTS SUCH AS HORMONE REPLACEMENT THERAPY CAN AFFECT THE DENSITY OF BREAST TISSUE



# WHY DOES BREAST DENSITY MATTER WHEN IT COMES TO DIAGNOSTICS?

- DENSE BREAST TISSUE MAKES IT HARDER FOR A RADIOLOGIST TO DETECT BREAST CANCER BECAUSE BOTH TUMORS AND DENSE BREAST TISSUE APPEAR WHITE ON A MAMMOGRAM.
- ALTHOUGH HAVING DENSE TISSUE IS ONE OF THE RISK FACTORS ASSOCIATED WITH BREAST CANCER, IT DOES NOT MEAN THAT IF YOU HAVE DENSE BREASTS, THAT YOU AUTOMATICALLY WILL DEVELOP CANCER.
- IT JUST PUTS YOU AT A HIGHER RISK OF DEVELOPING CANCER, BECAUSE LIKE PREVIOUSLY MENTIONED, IT'S JUST HARDER TO DETECT LESIONS IN THAT DENSE TISSUE OVER FATTIER TISSUE.

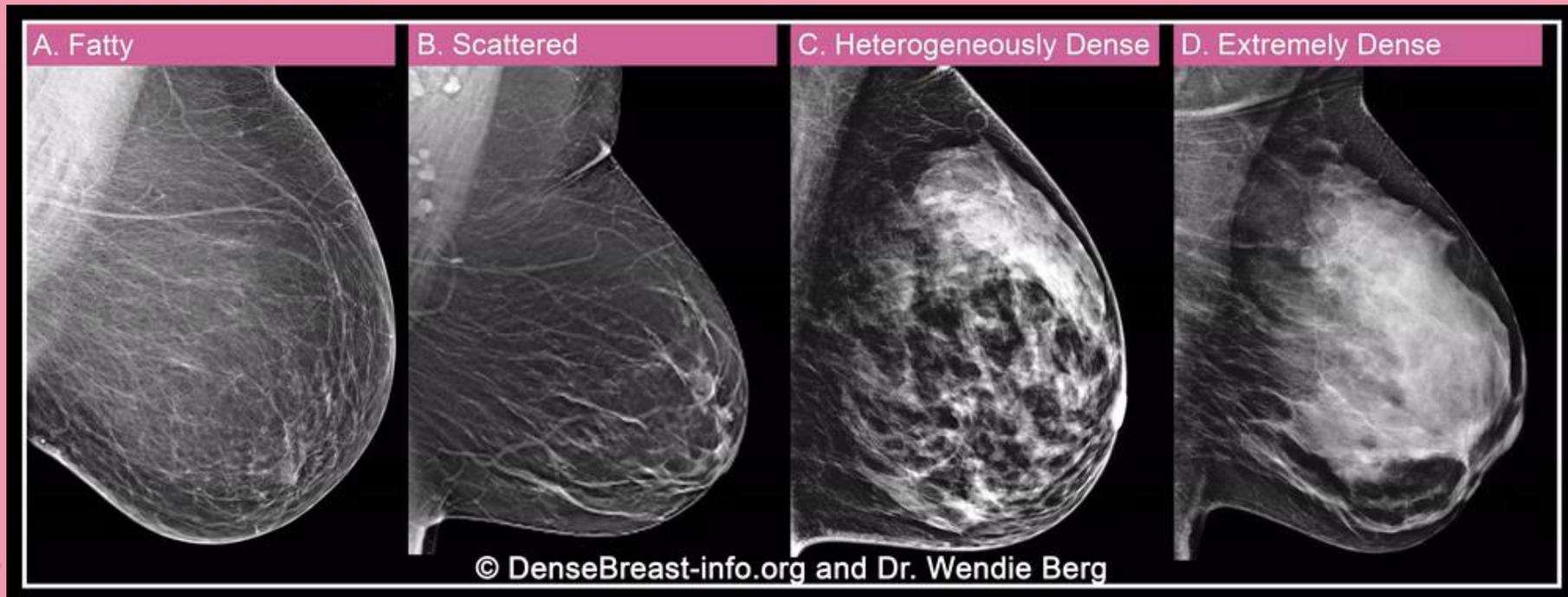


# WHY DOES BREAST DENSITY MATTER WHEN IT COMES TO DIAGNOSTICS?



INDIVIDUALS WITH EXTREMELY DENSE BREASTS (CATEGORY D) ARE FOUR TO FIVE TIMES MORE LIKELY THAN THOSE WITH MOSTLY FATTY TISSUE (CATEGORY A) BREASTS TO DEVELOP BREAST CANCER. INDIVIDUALS WITH HETEROGENEOUSLY DENSE BREASTS (CATEGORY C) ARE ALSO MORE LIKELY TO DEVELOP BREAST CANCER (CAMPBELL, 2025).

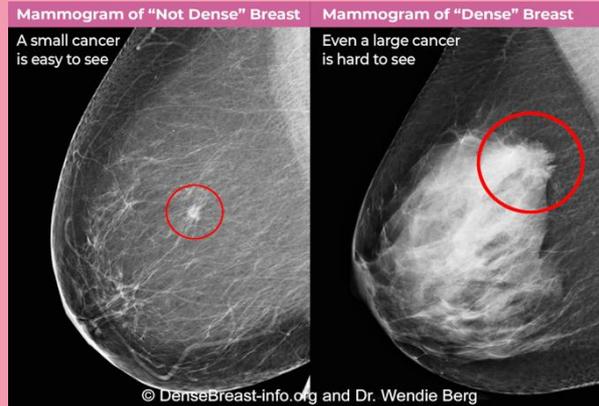
# WHAT DO DIFFERENT DENSITIES LOOK LIKE ON A MAMMOGRAM?



Note: From *Dense Breasts Info*, by Dense Breasts Info, 2026, <https://densebreast-info.org/>

# THE MASKING EFFECT

AS DISCUSSED EARLIER, THE DENSE TISSUE APPEARS WHITE ON A MAMMOGRAM. UNFORTUNATELY, SO DO MOST CANCERS AND LESIONS. THIS CREATES A MASKING EFFECT THAT CAN EASILY OBSCURE MALIGNANCIES IN DENSE BREASTED WOMEN. DENSE BREAST TISSUE ALSO ALLOWS FOR A HIGHER RATE OF FALSE NEGATIVES AND CALL BACKS, OFTEN REQUESTING ADDITIONAL MAMMOGRAPHIC IMAGES OR ULTRASOUND TO TAKE A BETTER LOOK INTO THE SUSPICIOUS TISSUE AREA. SHOWN BELOW IS AN EXCELLENT EXAMPLE OF THE MASKING EFFECT AND HOW EASY A LESION CAN BE HIDDEN WITHIN DENSE BREAST TISSUE (ABDOLELL, 2025).



# HOW DOES 3D IMAGING (DBT) HELP TO IMPROVE DETECTION OF LESIONS IN DENSE BREASTS?

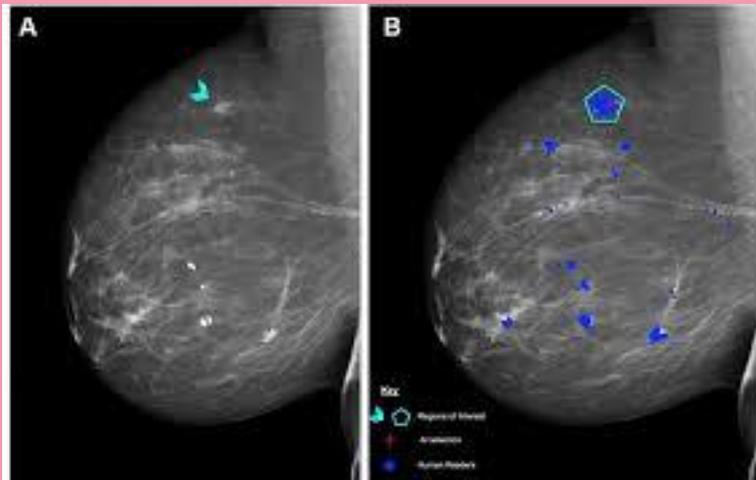


Note: From *Breast Ultrasound*, by A Woman's Place, 2026,  
<https://www.awnaples.com/services/breast-imaging/>

3D BREAST IMAGING, OR "DBT" (DIGITAL BREAST TOMOSYNTHESIS) CREATES A SLICE-BY-SLICE VIEW OF THE BREAST BY MAKING AN ARC MOVEMENT WHILE TAKING THE IMAGES, GIVING IT A "3D" APPEARANCE. THIS ALLOWS THE RADIOLOGISTS TO SCROLL THROUGH THE DENSE OVERLAPPING TISSUE, UNLIKE 2D WHERE YOU CAN ONLY SEE THE STANDARD FLAT 2D IMAGE. BECAUSE OF 3D'S IMPROVED ACCURACY AT DETECTING SUSPICIOUS FINDINGS, IT REDUCES THE CALLBACK RATE AND UNNECESSARY TESTING (MAYO CLINIC, 2024).

# THE FUTURE OF BREAST DENSITY MEASUREMENT

AS WITH A LOT OF THINGS NOWADAYS, THE FUTURE OF DETERMINING BREAST DENSITY IS DRIVEN BY AI (ARTIFICIAL INTELLIGENCE). AS MANY OF US HAVE SEEN, RADIOLOGISTS ARE USING COMPUTER-AIDED DETECTION (CAD) TO ASSIST THEM WITH THE DETECTION OF ANYTHING SUSPICIOUS ON MAMMOGRAMS. THE EVOLUTION OF AI IS BECOMING A VERY HELPFUL TOOL IN GENERATING DENSITY REPORTS.



Note: From *AI Performs*, by RSNA, 2023, <https://www.rsna.org/news/2023/september/ai-reads-mammograms-like-humans>

HOWEVER, SOMETIMES CAD CAN BE TOO SENSITIVE IN ITS FINDINGS, LEADING TO A HIGHER FALSE POSITIVE OR CALL BACK RATE. IT NEEDS TO BE CLOSELY MONITORED BY A RADIOLOGIST AS IT GENERATES THE REPORT.



# HOW CAN OTHER IMAGING MODALITIES HELP COMBAT DENSE BREAST TISSUE?

WHEN MAMMOGRAMS END UP NOT VISUALIZING A CERTAIN AREA AS WELL AS WE NEED IT TOO, OR, WHEN WE JUST NEED TO TAKE A DIFFERENT LOOK AT A CERTAIN AREA OF INTEREST, OTHER IMAGING MODALITIES CAN BE USED.

- ULTRASOUND: IS A VERY COMMON COMPLEMENTARY TOOL TYPICALLY USED AFTER FOLLOW UP MAMMOGRAMS ARE TAKEN. THEY ARE TYPICALLY THE GO TO OPTION WHEN DEALING WITH YOUNGER PATIENTS. ULTRASOUNDS ARE GREAT FOR GETTING A CLOSE-UP VIEW AT SUSPICIOUS AREAS SUCH AS CYSTS OR TUMORS. IT'S IMPORTANT TO REMEMBER THAT ALTHOUGH IT IS NICE BECAUSE THERE IS NO RADIATION DOSE, THAT THESE DO NOT REPLACE A MAMMOGRAM.
  - MRI: COMMONLY USED FOR HIGHER-RISK PATIENTS AND ARE GREAT FOR PATIENTS WITH DENSE BREASTS. MRI PROVIDES A VERY DETAILED VIEW (CLEARER THAN ULTRASOUND) IF YOU ARE TRYING TO IDENTIFY A SPECIFIC AREA IN DENSE TISSUE.
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# THE TECHNOLOGIST'S ROLE



AS A TECHNOLOGIST, THERE ARE MANY THINGS WE CAN DO TO ENSURE OUR PATIENTS ARE RECEIVING THE BEST QUALITY IMAGING AND PATIENT CARE.

- ENSURING PROPER POSITIONING FOR EACH VIEW (CC, MLO, SPOT, ETC.) AND MAKING THERE IS ADEQUATE TISSUE INCLUDED.
- MAKING SURE THERE IS ADEQUATE COMPRESSION, ESPECIALLY FOR DENSE BREASTED WOMEN TO SEPARATE THE TISSUE AS MUCH AS POSSIBLE
- COMMUNICATE CLEARLY WITH PATIENTS AND ANSWER ANY QUESTIONS THEY MAY HAVE



ENSURING THAT YOUR PATIENTS ARE RECEIVING THE BEST PATIENT CARE IS CRUCIAL IN MAMMOGRAPHY. ESTABLISHING TRUST AND GIVING THEM A POSITIVE EXPERIENCE WILL NOT ONLY ENCOURAGE THEM TO COME BACK IN THE FUTURE, BUT ALSO IMPROVES THE QUALITY OF THE IMAGES.



# THE TECHNOLOGISTS ROLE CONT.

NOT ONLY DO WE HAVE TO BALANCE THE ENTIRE PATIENT CARE ASPECT OF MAMMOGRAPHY. WE ALSO NEED TO KEEP IN MIND THAT WHEN DEALING WITH DENSE BREASTS, ESPECIALLY AT A FACILITY THAT DOES DIAGNOSTICS, THAT THERE IS A GOOD CHANCE WE NEED TO DO ADDITIONAL VIEWS (SPOT VIEWS, TRUE LATERALS, ROLLED VIEWS, ETC. ). TISSUE CAN STILL OVERLAP EVEN WHEN USING THE CORRECT POSITIONING TECHNIQUE, SO ADEQUATE COMPRESSION IS VERY IMPORTANT. MAKE SURE TO EDUCATE YOUR PATIENT THAT THE MORE COMPRESSION, THE BETTER, HOWEVER THEY SHOULD NOT BE IN UNBEARABLE PAIN. WE WANT TO MAKE SURE THEY CONTINUE TO COME BACK.



# SOME KEY FUN FACTS

## ONE IN 8 WOMEN

1 IN 8 WOMEN WILL GET BREAST CANCER



## HOW TO PREVENT IT

1 YEAR MAMMOGRAM

30 DAYS SELF-EXAMINATION

EVERY DAY EAT HEALTHY

EVERY DAY DO EXERCISE

15MIN/365 SUNBATHE

## CANCER NEWS



138 MILLION NEW CASES WORLDWIDE.  
IT IS THE MOST COMMON TYPE OF  
CANCER IN WOMEN (CLINIC, 2023).



MORE INFO COMING UP

A stylized sun icon in the top left corner, featuring a yellow circle with orange and red rays extending outwards.

# *CAN SUN EXPOSURE AFFECT THE RISK OF BREAST CANCER?*

ACCORDING TO MULTIPLE STUDIES CONDUCTED BY DR. YILUN LI & DR. LI MA, THE ANSWER IS YES. "WE FOUND AN OVERALL NEGATIVE ASSOCIATION BETWEEN EXPOSURE TO SOLAR UV RADIATION AND BREAST CANCER RISK, PERHAPS BECAUSE SUNLIGHT (AT 280–315 NM) CATALYZES THE SYNTHESIS OF VITAMIN D, WHICH CAN REDUCE BREAST CANCER RISK. VITAMIN D CAN INHIBIT THE PROLIFERATION OF BREAST CANCER CELLS BY INDUCING APOPTOSIS AND DOWN-REGULATING THE EXPRESSION OF KV10.1 CHANNELS." IN THEIR FINAL CONCLUSION, THEY STATED "OUR META-ANALYSIS FOUND THAT EXPOSURE TO SOLAR ULTRAVIOLET RADIATION REDUCES THE RISK OF BREAST CANCER, ESPECIALLY IN WOMEN OVER 40." (LI & MA 2020).





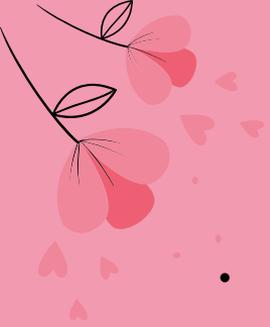
# 2017 WISCONSIN ACT 201

ACCORDING TO THE WISCONSIN STATE LEGISLATURE, THE 2017 WISCONSIN ACT 201 REQUIRES FACILITIES PERFORMING MAMMOGRAMS TO PROVIDE A NOTICE TO PATIENTS ABOUT THE DENSITY OF THEIR TISSUE. BY DOING THIS IT CAN HELP WOMEN TO BE AWARE OF THEIR OWN RISK, AND INFORM THEM THAT THE DENSER THEIR TISSUE IS, THE HARDER IT WILL BE TO DETECT ANY CANCERS. THEY SHOULD KEEP THIS IN MIND WHEN CONSULTING THEIR DOCTOR ABOUT WHAT TYPE OF CARE IS BEST FOR THEM GOING FORWARD (2017).

THE GAILS LAW PASSED THE WISCONSIN STATE SENATE ON OCTOBER 14, 2025, AND IT CURRENTLY AWAITING STATE ASSEMBLY VOTE. WHEN PASSED, THIS LAW WOULD REQUIRE INSURANCES TO COVER ANY ADDITIONAL IMAGING THAT MAY BE NEEDED SUCH AS ULTRASOUND, MRI, AND OTHER DIAGNOSTIC EXAMS. THIS LAW WILL REMOVE ANY FINANCIAL BARRIERS THAT MAY BE HOLDING PEOPLE BACK FROM AN EARLY DIAGNOSIS. UNFORTUNATELY, THE COST OF THESE EXAMS IS MORE THAN LIKELY THE REASON WHY A LOT OF PEOPLE DELAY GETTING CARE UNTIL IT IS TOO LATE (WIBREASTCANCER.ORG, 2025).

*GAILS LAW*





# CONCLUSION

- BREAST DENSITY SIGNIFICANTLY AFFECTS MAMMOGRAPHIC INTERPRETATION AND CANCER DETECTION
  - DENSE TISSUE CAN MASK LESIONS, INCREASING FALSE NEGATIVES AND CALLBACKS
  - 3D MAMMOGRAPHY (DBT) AND SUPPLEMENTAL IMAGING (ULTRASOUND, MRI) IMPROVE DETECTION IN DENSE BREASTS
  - MAMMOGRAPHY TECHNOLOGISTS PLAY A KEY ROLE THROUGH PROPER POSITIONING, COMPRESSION, AND PATIENT COMMUNICATION
  - INCREASED AWARENESS, ADVANCING TECHNOLOGY, AND SUPPORTIVE LEGISLATION HELP IMPROVE EARLY DETECTION AND PATIENT OUTCOMES
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