

# Stereotactic Biopsy: Patient Positioning Tips and Tricks

Dawn Derenburger, R.T.(R)(M)(ARRT)  
Breast Imaging Consultant, Mammography Educators

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## Goals and Objectives

- Learn principles and concepts of the stereotactic breast biopsy procedure
- Review preparation skills and steps to perform the biopsy
- Discuss specimen imaging and clip placement



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## Breast Biopsy

- Sampling of a suspicious area for analysis
- Type of biopsy to perform is determined by:
  - Level of suspicion
  - Size, shape and location
  - Number of abnormalities seen



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## When to Use Stereo or DBT Biopsy

- Mammographic abnormality in the breast
- Non-palpable
- Lesion not seen with ultrasound
- Micro calcifications
- Finding seen on DBT only



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## Advantages of Stereotactic Biopsy

- Less invasive
- Performed in outpatient setting/Mammography Center
- Patient able to return to normal activity
- Procedure takes approximately 1 hour or under on average



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## Advantages of Stereotactic Biopsy

- Reduced scarring to the breast
- Cost-effective
- Minimal pain: controlled with local anesthesia administered by the radiologist
- Precise, accurate analysis and diagnosis



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## Disadvantages of Stereotactic

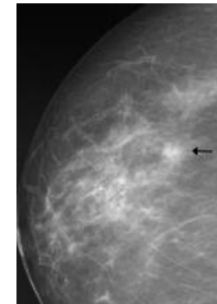
- Posterior lesions near chest wall
  - Limitations of equipment
  - Limitations of patient
- Area of interest too vague to visualize
- Missed lesions/calcs after successful sampling
- Non-concordant pathology



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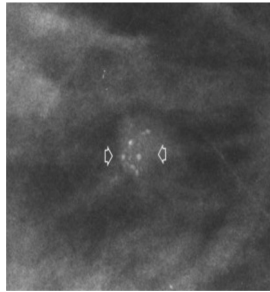
## Abnormality Not Seen with Ultrasound



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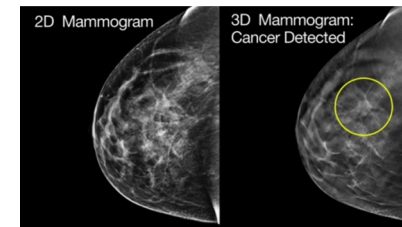
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## Micro Calcifications



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## Tomo-only Finding



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## Function of Stereotaxis Method in Breast Tissue Sampling

- Two 2-D images are obtained
- 15-degree angles + and – from center
- Images analyzed with software
- Result is a precise depth calculation of the area to be sampled (Z coordinate)



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## Stereotaxis Defined

- Stereotaxis is defined as pertaining to or characterized by precise positioning in space
- A system of three-dimensional coordinates for locating the target site



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## Digital Stereotactic Equipment



Prone Table



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## Digital Stereotactic Equipment



Upright Attachment



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## Digital Stereotactic Equipment



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## Digital Breast Tomosynthesis Biopsy Prone Table



Prone Table



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## Digital Breast Tomosynthesis Biopsy UPRIGHT Equipment



Upright Attachment



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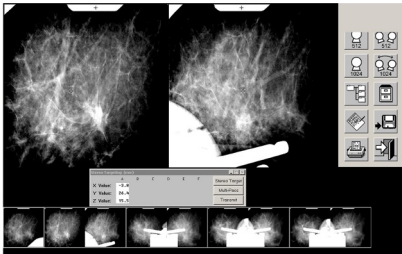
## Stereo vs DBT Imaging

- Prone and upright systems are available for both Stereo and DBT capabilities
- There are FFDM-only systems
- DBT systems models can perform DBT and stereo based on preference
  - Difference is the imaging sequence acquired



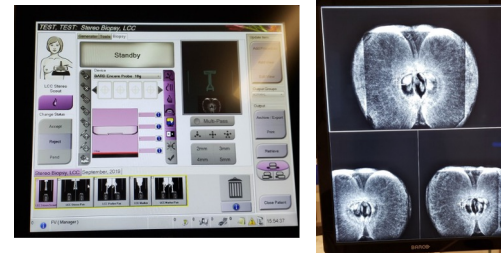
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## Stereo 2D Imaging



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## DBT Biopsy Sweep



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## Upright Attachment

- Quickly convert your existing mammography unit
- Utilize existing space
- Can be performed with patient seated upright or recumbent on designated biopsy chair/table
- Cost effective



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## Prone Table

- Dedicated procedure room
- Patient positioned prone with breast through opening
- Reduce risk of vasovagal event
- C-Arm allows for 360-degree access of the breast
- Reaching posterior lesions/calcs - gravity

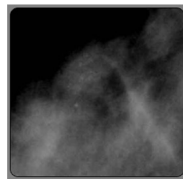


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## Stereo Procedure

- Same method for upright attachment and prone table
- Scout Image obtained



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## Procedure

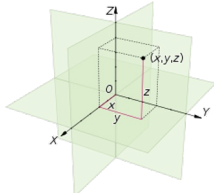
- Scout "Stereo Pair" is obtained
- Area closest to center as possible
- Two images tube angled 15 degrees from each side of scout



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## Cartesian Coordinates

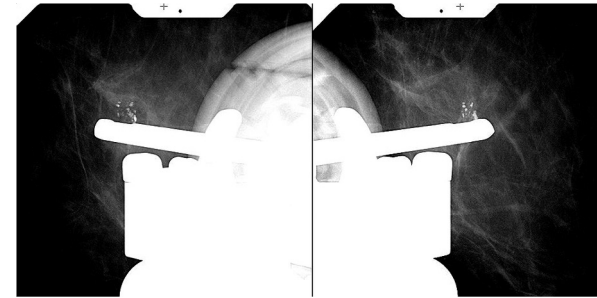


- X = horizontal axis
- Y = vertical axis
- Z = depth
- Stereo Pair is used to target the area of interest
- X,Y, and Z coordinates will precisely calculate the location within the breast



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## Before Getting Started - Technologist

### Prepare:

- View case in advance, one day if possible
- Review case with radiologist
- Direction of approach
- More than one area
- Know your target



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## Before Getting Started - Technologist

### Prepare:

- Know orientation of breast vs. how it displays
- Needle size: standard vs. petite
- Possible patient limitations
- Type of clip to use



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## Before Getting Started - Patient

### Explanation of the procedure:

- Prior to appointment date
- Brochure/handout
- Patient video from vendor
- Proper scripting



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## Before Getting Started - Patient

### Screening the patient:

- Diabetic
- Anti-coagulants
- Radiologist preference on if/when to discontinue
- Anxiety medication
  - Not to take until consent is signed



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## Before Getting Started - Patient

### Allergies to medication:

- Lidocaine
- Betadine/Chloraprep



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## Before Getting Started - Patient

- Compression
  - Upright vs. prone
- Challenging regions of interest
  - Comfort is key
- Importance of stillness throughout exam



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## Before Getting Started - Patient

### Explanation of clip placement:

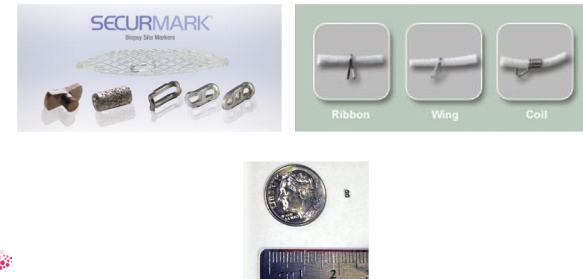
- Patient Anxiety: foreign object
- Have sample to demonstrate
- Any metal allergies/sensitivities



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## Types of Clips



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## Before Getting Started - Patient

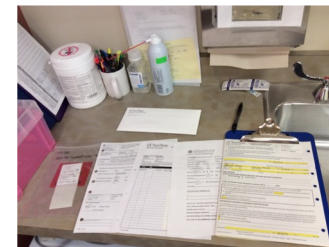
- Explanation of procedure: day of biopsy
  - What to say...What NOT to say.....
- Patient experience
  - Discomfort/pain
  - Be honest, explain sounds/feelings they may experience



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## Consent Form and Other Exam Paperwork



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## Informed Consent

- Any invasive procedure that involves risks
- Patient informed of the procedure to be performed, risks and consequences, any options available
- Age and mental status of patient



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## Before Getting Started - Patient

### Consent - form set-up:

- Separate line for clip placement
- Ensure patient is not under the influence of sedatives before signing legal document



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## Before Getting Started - Patient

- Patient's preferred language: interpreter systems may cause significant delays
- Marking side of interest: radiologist



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## Positioning the Patient

### Approach – Location of area of interest:

- CC FA- From above
- CC FB- From below
- MLO
- LMO
- ML
- LM



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## Positioning the Patient

Upright Biopsy Chair or Prone Table

- **Key in successful biopsy**
- Educate your patient and make them as comfortable as possible



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## Positioning - Preparing the Patient

- Protective cloth – chucks to protect clothing
- Warm blanket
- Wet washcloths
- Emesis basin



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## Positioning - Preparing the Patient

- Room temperature
- Sheet for table or chair
- Pillows
- Padding for pressure points
- Ammonia inhalants

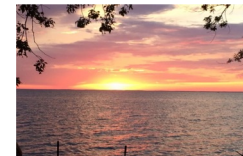


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## Preparing the Patient

- Provide realistic expectations to patient
- Aromatherapy
- Music
- Visual imagery



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## Preparing the Patient

- Warm blanket
- A hand to hold
- Friendly atmosphere



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## Tray Set-up

- Supplies needed:
- Radiologist preference
  - Number of sites



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## Tray Set-up

- When to set up:
- Depending on type of equipment and room availability
  - Tray should be set up as close to the procedure time as possible to maintain sterility



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## Sample of Tray Set-up



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## Draping the Prone Table



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## Vacuum Assisted Core Needle System

Enhances the sample integrity and size by using vacuum system for tissue collection



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## Vacuum Assisted Core Needle System

Many manufacturers offer variable:

- Needle gauges
- Needle depths
- Specimen handling



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## The Procedure

What the patient can expect:

- Positioning
- Imaging: finding lesion in safest possible approach
- Setting target for sampling
- Application of anesthetic



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## The Procedure

What the patient can expect:

- Attaching the biopsy needle to equipment stage
- Confirming accurate placement of needle
- Sampling
- Clip placement
- Imaging of sample



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IF THERE IS ANY QUESTION OF TABLE OR CHAIRS  
STOPPING THE MOVEMENT OF TUBE...

**STOP!**

DO NOT PROCEED WITHOUT VERIFYING  
EQUIPMENT IS WORKING PROPERLY.



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## Tissue Specimen Imaging

- Performed post-biopsy to confirm area targeted was removed
- Can be imaged with mammo unit using magnification for calcifications
- Dedicated stand-alone specimen unit
- Accuracy and speed critical



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## Tissue Specimen Imaging

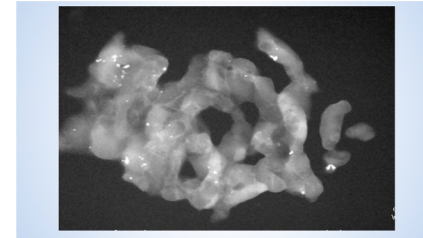
- Microscopic analysis
  - Cytology: the microscopic examination of cell samples
  - Histology: the microscopic examination of tissue samples
- Confirmation or ruling out of malignancy



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## Tissue Sample Image



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## Clip Placement

- Clip placed after lesion or area of concern is removed
- Provides landmark to original site
- Made of stainless steel or a collagen-based material



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## Post Procedure

- Patient care
  - Holding pressure
  - Cleaning and bandaging
  - Post-care instructions
- Post-clip images for clip location documentation



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## Post Biopsy Imaging

- Biopsied breast is imaged with routine CC and 90-degree ML or LM views
- Radiologist reviews post-biopsy images for confirmation of clip placement and location
- Patient remains in “recovery” area until images are reviewed



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## Post Biopsy Imaging



Laura Shepardon, MD November 2016



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## Complications

- Vasovagal reaction
- Missed target
- XYZ error
- Movement of patient
- Breast compresses beyond capability of equipment



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## Complications

### Target Obscured

- Dense breast tissue
- Lack of compression over target area
- Lidocaine
- Snowplowing of calcs



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## Vasovagal Reaction

- What is happening?
- Vasovagal syncope (vay-zoh-VAY-gul SING-kuh-pee) occurs when you faint because your body overreacts to certain triggers, such as the sight of blood or extreme emotional distress



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## Vasovagal Reaction

- The vasovagal syncope trigger causes your heart rate and blood pressure to drop suddenly
  - That leads to reduced blood flow to your brain, causing you to briefly lose consciousness
- Vasovagal syncope is usually harmless and requires no treatment



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## Vasovagal Reaction – Patient Experience

- Before you faint due to vasovagal syncope, you may experience some of the following:
  - Pale skin
  - Lightheadedness
  - Tunnel vision - your field of vision narrows, so that you see only what's in front of you



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## Vasovagal Reaction – Patient Experience

- Nausea
- Feeling warm
- A cold, clammy sweat
- Yawning
- Blurred vision



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## Vasovagal Reaction – Signs to Watch For

- Jerky, abnormal movements
- A slow, weak pulse
- Dilated pupils
- Patient complains of being hot



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## Vasovagal Reaction – Preventative Measures

- Patient as comfortable as possible
- Room temperature not too warm
- Cold compress



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## Vasovagal Reaction – Preventative Measures

- Aromatherapy
- Distracting conversation
- Moving feet or toes



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## Vasovagal Reaction

If preventative measures don't work:

- DON'T Panic
- Remain calm



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## Vasovagal Reaction

Move quickly and accurately:

- Slowly remove needle from breast
- Hold compression
- Cold washcloth to back of neck/forehead
- Get patient into Trendelenburg position
- Check and monitor BP



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## Vasovagal Reaction

Can we continue on?

- Patient tolerability level
- Change position and approach
- Stretcher or reclined biopsy chair



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## Missed Target

What could have happened?

- Accuracy of target coordinates
- Wrong area targeted
- Tissue consistency
- Equipment malfunction

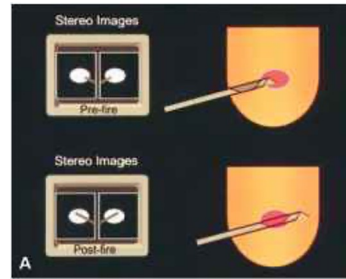


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## XYZ Errors

How to spot them



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## XYZ Errors – How to Correct

Attempt sample

- Pull of vacuum-assisted device
- Image sample
- Re-image stereo pair



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## XYZ Errors – How to Correct

- Reposition and retarget
- “Jog” the needle inside or outside the breast
  - Depends on distance
  - Radiologist comfort



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## Target Obscured

- Extremely dense breast tissue with fine microcalcifications
- Lidocaine
  - How much is too much?
  - Snowplowing of calcs
- Ways to correct
  - Patient comfort is key
  - Communication with radiologist



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## Patient Movement

- Ways to prevent
- How to recognize
  - Image blur
  - Markings you made on patient have moved
- How to correct



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## Breast Thickness

Compresses too thin:

- Target area/check coordinates
- $Z + 6$  is equal to or less than compression
  - Know the calculation for your equipment
  - Malfunctions DO happen
- Different needle
  - Petite
  - Blunt tip non-firing



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## Breast Thickness

- Firing outside the breast
- Different approach
- Build the breast up
  - Play-doh
  - Tape
  - Tagaderm



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## ACR Accreditation

- Facilities are not required to be accredited in Stereotactic Breast Biopsy in order to perform the procedure
- Staff must meet and maintain the minimum requirements
- Breast Center of Excellence



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## References

Shephardson M.D. Laura. (2016) Improvements In Womens Health <https://www.itnonline.com/article/room-improvement-women%E2%80%99s-health-2>



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