Plan

- Palpable breast mass
- Non-Palpable breast mass
- Mastalgia
- Nipple Discharge
- Mastitis

I HAVE NO DISCLOSURES
Failure to diagnose breast cancer in a timely manner is a leading cause of malpractice claims.

Common reasons:
- Unimpressive physical findings
- Failure to f/u with pt
- Palpable mass with negative mammo

“Dominant Mass”?
- Discrete or dominant mass = stands out from adjoining breast tissue, definable borders, is measurable, not bilateral.
- Nodularity or thickening = ill-defined, often bilateral, fluctuates with menstrual cycle
- In women <40 referred for mass, only 1/3 had confirmed dominant mass

Breast Mass: Diagnostic Options
- Physical exam
- Ultrasound
- Mammogram
- Cyst aspiration
- Fine needle aspiration
- Core needle biopsy
- Excisional biopsy

Likelihood of Cancer in Dominant Breast Mass by Age

Of all discrete breast masses, about 10% are cancerous. (In contrast, 8% of abnormal mammos = cancer)
Question 1

A 42 yo old woman with no family or personal history of breast cancer has found a breast lump. She doesn’t know how long it has been there. It is not painful.

On exam, it is a discrete mass, 2 cm, relatively smooth, mobile and non-tender. She has no axillary lymphadenopathy.

What is your next step?

Q1: Palpable mass in 42 yo

Next step (pick one)?
A. Nothing now. Re-examine in 1-2 months
B. Ultrasound
C. Mammography
D. Office aspiration
E. FNAB
F. Core biopsy

Q1b: Palpable mass in 42 yo

A mammography was chosen and is negative. Next step (pick one)?
A. Re-examine in 1-2 months
B. F/u 1 year for annual exam
C. Ultrasound
D. Office aspiration
E. FNAB
F. Core biopsy

Q1c: Palpable mass in 42 yo

An ultrasound was chosen as the first step. It shows a cystic mass. Next step?
A. Re-examine in 1-2 months
B. F/u 1 year for annual exam
C. Office aspiration
D. FNA
E. Core biopsy
Step 1: Palpable Breast Mass

- Determine if mass is cystic or solid
- Simple cysts are benign and don't require further evaluation
- 20-25% of palpable masses are simple cysts, most occurring in 40-49 yo’s
- Options?: Ultrasound, office aspiration, FNA, core needle biopsy

Breast Exam

- Nether sensitive (50-60%) nor specific (60-90%) (even when done by experts)
- Cannot reliably distinguish cyst from solid
- Nonetheless, it is important for determining if mass is discrete (vs nodularity or thickening), is a necessary adjunct to mammogram and is required for follow-up of masses
- Perform in 2 positions, methodical, spirals or strips
- Mark mass prior to biopsy so others can find it

Ultrasound

- **Primary Use**: Classify mass as cystic or solid
- Guidance for cyst aspiration or biopsy
- Adjunct to evaluate symmetric densities detected by mammography
- Can be the first test performed & if cyst is confirmed—the only test required

Fibroadenoma

<table>
<thead>
<tr>
<th>Fibroadenoma</th>
<th>Cancer</th>
<th>Cyst</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-circumscribed, superficial</td>
<td>Irregular, deep</td>
<td>Anechoic, well-circumscribed</td>
</tr>
</tbody>
</table>

Ultrasound is 98-100% accurate for diagnosis of simple cysts. However, for solid masses, it cannot reliably distinguish benign from malignant.
**Cyst Aspiration**

- **Simple office procedure:** 20-23 gauge needle and syringe, ultrasound guidance optional, specialized training not necessary
- **Primary Use:** Confirm mass is cystic
- **Secondary use:** Relieve pain/pressure due to symptomatic cyst
- **Benefits:** If cystic fluid obtained, establishes immediate diagnosis and provides symptomatic relief

**Cyst Aspiration (cont’d)**

Adequate/reassuring if:
1. Cyst fully collapses (no residual mass)
2. Fluid is not brown/red (cloudy ok)
3. Does not re-accumulate (i.e. frequent f/u)
- If all are true, no need to send fluid.
- F/u in 1-3 months to ensure no reaccumulation or residual mass
- If no fluid or if bloody → further workup

**Fine Needle Aspiration: QUIZ**

- FNAB should be done by an experienced cytopathologist or breast surgeon? ...TRUE OR FALSE?
- A diagnosis of FATTY TISSUE on FNA means what?
- When should you FOLLOW-UP a woman with a palpable mass and negative FNA and mammogram?
Fine Needle Aspiration Biopsy

- **Primary Use**: Diagnosis of solid masses
- **Least invasive biopsy method**
- **Sensitivity is operator dependent**:  
  - For experienced personnel, 92-98%  
  - For untrained personnel, 75% Average (as low as 65%).
- **Experienced cytopathologist necessary to interpret**
- Cannot diagnose DCIS, atypical hyperplasia or infiltrating carcinoma
- A non-diagnostic result in the setting of a discrete mass requires further work-up (possible sampling error)

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Palpable mass: Diagnostic Mammography

- Cannot accurately differentiate benign from malignant masses or cystic from solid
- Poor sensitivity in young women due to density
- 15-20% of mammos are normal in women with palpable mass
- **Primary Use**: Screen opposite breast (in women >40 yo) and identify other non-palpable suspicious areas
- **Secondary use**: Further classification of the palpable mass  
  EVEN IF THE MAMMO IS NORMAL, FURTHER WORK-UP IS REQUIRED

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Breast Cyst

- Palpable mass:
- Cyst is anechoic on ultrasound
- Can't distinguish cyst from solid on mammogram

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Breast Density

- Even if the mammogram is normal, further work-up is required.
Core Needle Biopsy

- **Primary Use**: Diagnosis of solid masses, f/u of non-diagnostic FNAB
- Unlike FNAB, it can distinguish DCIS from invasive disease and because it is a tissue specimen, interpretation is easier
- Few direct comparisons to FNAB for palpable lesions: Studies mixed for sensitivity—some showing FNA better and some with CNB better. Similar specificity.

Core Needle Biopsy (cont’d)

- Like FNAB, requires training to prevent false negatives due to sampling error
- Used instead of FNAB by consultant preference or where cytopathology service not skilled in interpretation
- Also preferred for evaluation of non-palpable lesions

Question 1

A 42 year old woman with no family or personal history of breast cancer has found a breast lump. She doesn’t know how long it has been there. It is not painful.

On exam, it is a discrete mass, about 2 cm, relatively smooth, mobile and non-tender. She has no axillary lymphadenopathy.

What is your next step?
So, what is the best first step?

- **First step = determine if cystic or solid.**
- How depends on your institution (availability and expertise of various services) and whether patient is symptomatic
- **FNAB:** Therapeutic, diagnostic and cost-efficient
- **U/S:** Similar in cost to FNAB, but FNAB more cost effective b/c 80% of masses are NOT cystic on U/S and will require FNAB to further evaluate
- **If FNAB not available:** U/S first will eliminate need for core biopsy in 20% that do have cysts

- **Office aspiration:** Reasonable 1st step esp if symptomatic. If not cystic, will require biopsy
- **Mammography:** Not best 1st step b/c can't reliably distinguish benign from malignant or cystic from solid (but is usually part of a complete evaluation)
- **F/U 1-2 mos:** Could be ok in young woman (<40) who will reliably follow-up. Discuss options, get agreement, document well. If mass persists, go to U/S or FNA.

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**Triple test**

- Improved accuracy by combining:
  1. FNAB or core biopsy
  2. Mammography (or ultrasound)
  3. Physical exam
- When all 3 results concordant, 99% accuracy
- However, PE adds little b/c not specific. Its role is simply to document dominant palpable mass
- If any one is suspicious, core or excisional biopsy

**Accuracy of triple test**

Mass “benign” on Palpation
Step 2: for a cystic mass...

- If symptomatic, aspirate
- If diagnosed by ultrasound and no aspiration is done, f/u 1 year.
- If aspirated and fluid is not bloody, f/u 1-3 months to ensure no residual mass or re-accumulation
- For any patient >40, also get mammo for screening (>50 recommend, >40 shared decision)

Step 2: for a solid mass

- Biopsy (FNA or core needle biopsy)
- PLUS
- Mammogram (to further characterize mass and to screen rest of breasts)
- If both are negative, f/u 3-6 months
- If either is equivocal or results are not concordant, refer to breast surgeon for further evaluation

Ultrasound F/u instead of biopsy for solid mass?

- 2 small retrospective cohort studies—largest n=312 with palpable mass & U/S = "probably benign"
- Mostly young women so low pretest probability of cancer (avg age 34yo)
- Strict criteria for calling lesion "probably benign"
- 2 of 312 were cancer. NPV=0.6%.
- Conclude ok to not biopsy and follow with q 6mo u/s for 2 yrs (sim to f/u of birads3 mammo)
- Caution: retrospective

How are we doing?

- In a study of women with a palpable mass and negative mammo, only 57% received any subsequent evaluation.
  - Latinas, obese and uninsured less likely to have any subsequent evaluation
- A recent study of delay in diagnosis found the most common reason was inappropriate reassurance of women with a lump and normal mammogram
Summary: Palpable Breast Mass

- Choice of work-up often depends on availability and expertise of FNA, U/S and core needle biopsy
- None of these tests is 100% accurate, maintain a high index of suspicion
- Triple test is gold standard. If any of the 3 tests is discordant → continue work-up
- Frequent f/u even for masses thought to be benign to detect false negatives

**Dominant Breast Mass**

<table>
<thead>
<tr>
<th>U/S or Aspirate*</th>
<th>Simple cyst</th>
<th>If aspirate and no residual lump, fluid not bloody then do CBE 4-6 wks. If u/s, no further w/u.</th>
</tr>
</thead>
<tbody>
<tr>
<td>U/S or Aspirate*</td>
<td>Cancer</td>
<td>Do FNA or core bx</td>
</tr>
<tr>
<td>Atypical, suspicious</td>
<td>Positive Mammography</td>
<td>More imaging, core or excision bx</td>
</tr>
<tr>
<td>Benign</td>
<td>Negative Mammography</td>
<td>CBE 3-6 mos</td>
</tr>
<tr>
<td>Non-diagnostic</td>
<td>Repeat FNA, core or excision biopsy</td>
<td></td>
</tr>
</tbody>
</table>

*Aspirate=office aspiration or FNAB Adapted from Kerlikowske, Ann Int Med, 2003

**Q1b: Palpable mass in 42 yo**

A mammography was chosen and is negative. Next step (pick one)?

A. Re-examine in 1-2 months
B. F/u 1 year for annual exam
C. Ultrasound
D. Office aspiration
E. FNA
F. Core biopsy

Note: Mammo cannot distinguish cyst from solid and is negative in 15% with palpable mass so need to proceed with work-up from Step 1 to cyst vs solid.
Q1c: Palpable mass in 42 yo

An ultrasound was chosen as the first step. It shows a cystic mass. Next step?

A. Re-examine in 1-2 months
B. F/u 1 year for annual exam
C. Office aspiration
D. FNA
E. Core biopsy

Simple cysts are benign and no further work-up is required. If the cyst is symptomatic, may aspirate in office.

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Pre/Post Test Probability of cancer based on mammo results and age

Table 4. Risk for Breast Cancer Based on Age and Mammographic Interpretation*

<table>
<thead>
<tr>
<th>Age Type and Type of Screening Examination</th>
<th>Risk for Breast Cancer (2)</th>
<th>Risk for Breast Cancer Based on Age and Mammographic Interpretation BI-RADS Assessment</th>
<th>Follow-up of Abnormal Screening Mammogram</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest Probability of Breast Cancer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50-59 years</td>
<td>0.0000</td>
<td>0.0000</td>
<td></td>
</tr>
<tr>
<td>60-69 years</td>
<td>0.0001</td>
<td>0.0001</td>
<td></td>
</tr>
<tr>
<td>70-79 years</td>
<td>0.0003</td>
<td>0.0003</td>
<td></td>
</tr>
<tr>
<td>80-89 years</td>
<td>0.0008</td>
<td>0.0008</td>
<td></td>
</tr>
<tr>
<td>90+ years</td>
<td>0.0049</td>
<td>0.0049</td>
<td></td>
</tr>
</tbody>
</table>

*BI-RADS = Breast Imaging, Reporting and Data System

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Work-up of non-palpable lesions

BI-RADS: Breast Imaging Reporting and Data System

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Follow-up of abnormal screening mammogram

If normal, repeat screen 6 mos then q 1-2 yrs

If normal, repeat screen 6 mos then q 1-2 yrs

Breast Pain

- 2/3 - 3/4 report it
- > 1/2 of breast visits
- Etiology unknown: not associated with prolactin, estrogen or progesterone levels
- 2 types: cyclic & non-cyclic
- Both types chronic, relapsing especially if severe or early onset
- Severe breast pain interferes with sex (46%), activity (36%), social (13%), work (6%)

Mastalgia: Treatment

- Work-up: risk factor evaluation, exam, mammo if >40 years
- Determine effect on QOL
- 60-80% resolve spontaneously.
- Reassurance often sufficient

Mastalgia: Treatment

Proven in RCT’s:
- NSAID’s (topical and oral)
- Evening Primrose Oil
- Vitex agnus castus extract-containing solution (VACS)
- Gestrinone (N/A in US)
- Progesterone vaginal cream
- Bromocryptine
- Danazol
- Tamoxifen

No benefit (per RCT’s, though many are small and likely underpowered)
- Caffeine restriction
- Vitamin E
- Vitamin B6
- Diuretics
- Provera
- Soya protein
- Isoflavones

Other: Supportive, well fitting bra, bra at night, trigger point injections for localized pain, OCP’s—help some, make worse in others. If on OCP, try lower dose of Estradiol

Topical NSAID for mastalgia

Diclofenac topical (Voltaren) q 8hr vs placebo cream. Randomized, double-blinded

<table>
<thead>
<tr>
<th>Group</th>
<th>No.</th>
<th>Before treatment</th>
<th>After treatment</th>
<th>Change in pain score</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (Pla)</td>
<td>36</td>
<td>7.53 (1.30)</td>
<td>5.30 (1.28)</td>
<td>-2.23</td>
<td>0.001</td>
</tr>
<tr>
<td>Diclofenac (Top)</td>
<td>36</td>
<td>7.02 (1.30)</td>
<td>5.13 (1.30)</td>
<td>-1.89</td>
<td>0.001</td>
</tr>
<tr>
<td>Provera (Spa)</td>
<td>26</td>
<td>7.46 (1.40)</td>
<td>5.00 (1.38)</td>
<td>-2.46</td>
<td>0.001</td>
</tr>
<tr>
<td>Topical + OCP</td>
<td>26</td>
<td>7.51 (1.40)</td>
<td>5.32 (1.32)</td>
<td>-2.19</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Topical diclofenac very effective, 1000 mg bid-tid for 2-3 months

Most effective but poorly tolerated

Colac, Journal of the American College of Surgeons, April 2003
Mastalgia: Prescribing Guide

Proven in RCT's:
- **NSAID's** (topical diclofenac q 8hr very effective in 3 RCTs; oral NSAIDs—moderately effective in some but not all RCTS)
- Evening Primrose Oil: 1000mg tid for at least 1 mo trial, >$2/day, mild nausea. Recent meta-analysis showed no benefit
- Bromocriptine: increase dose gradually to decrease side effects (nausea, dizziness, orthostatic hypotension, headache). 1.25 mg qhs, increase by 1.25 mg every week until 5 mg/day.
- Danazol: best of the endocrine agents but virulizing side effects make it less desirable, teratogenic, expensive. Start at 200mg qd. Taper down as tolerated to 100mg every other day or qd during luteal phase.

Proven in RCT's (continued):
- Tamoxifen: 10 mg qd, hot flashes, expensive
- Torimefin: 30 mg qd, vag d/c, irreg menses
- GnRH agonists: very expensive, menopausal side effects, can only use for 6 months due to bone loss.
- Local Injections: trigger point injection of 1% lidocaine (1cc) and methyl prednisone (40mg). Half require second injection in 2-3 months.

Nipple Discharge

- Usually benign or malignant? *benign*
- Most common cause of unilateral discharge? *intraductal papilloma*
- Other causes: duct ectasia, nipple eczema, Paget disease
- If associated with mass, more likely to be cancer (but cancer rarely presents with nipple d/c)

Physiologic:
- Due to galactorrhea (ie increased prolactin) or nipple stimulation
- With compression
- Multiple ducts
- Clear, yellow, white
- No mass

Pathologic:
- Papilloma, cancer
- Spontaneous
- Single duct
- Bloody
- Mass present
Nipple Discharge: Diagnosis

**Physiologic:**
- History: running, breast stimulation
- Prolactin, TSH
- Meds: Psychotropics

**Pathologic (Spont, unilat):**
- Isolate involved duct
- Hemoccult to confirm blood, cytology not useful
- Mammography with retro-alveolar views
- Galactography controversial
- Surgery referral

Mastitis

- 2 types: lactating vs non-lactating
- Primary vs secondary (cellulitis, folliculitis, hydradenitis, sebaceous cyst)

Cellulitis

Lactational Mastitis

- Suspect in any breast-feeding woman with a fever and malaise
- Often wedge shaped redness over involved duct
- Staph, Strept—(community acquired MRSA becoming more common so do culture of milk)

Non-Lactational Mastitis

- Difficult to treat
- Often chronic, recurrent
- Peri-areolar: young (avg 32), 90% are smokers, central pain, nipple retraction and discharge, often assoc with abscess
- Peripheral: elderly, usually associated with underlying disease (diabetes) or trauma
- Gram negatives, staph, strept, anaerobes
Mastitis Treatment

**Lactational**
- Increase feeding, warm compresses
- Keflex, Dicloxicillin
- IV if not better quickly
- Septra or Clinda for community acquired MRSA

**Non-Lactational**
- Include anaerobic coverage
- Clindamycin or Flagyl + Ancef or Nafcillin

**Biopsy if recurrent or doesn’t resolve**

Breast Abscess

- Suspect if "lump" on exam or if mastitis not responding to abx
- Ultrasound to confirm
- Get culture
- Aspiration now preferred over I&D
- Sometimes need repeated aspirations
- I&D often assoc with poor cosmetic result or fistula

Cancer can mimic mastitis

Inflammatory Cancer