MRI-guided biopsy "salsa". Can you guess the result?

by Anabel M Scaranelo

Disclosures

- I do not have any relevant financial relationships with any commercial interests at this moment.

OVERVIEW

- Case presentation base
- 7 cases
- MRI-guided biopsy
- Discussion of relevant tips for daily practice
- 3 questions

Q1question 1

- A) True
- B) False

Q2: question2

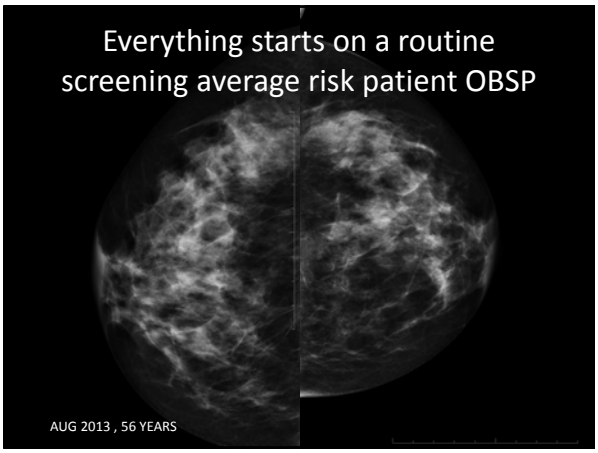
A. < 2%
B. 2-4%
C. 4-6%
D. 6-8%

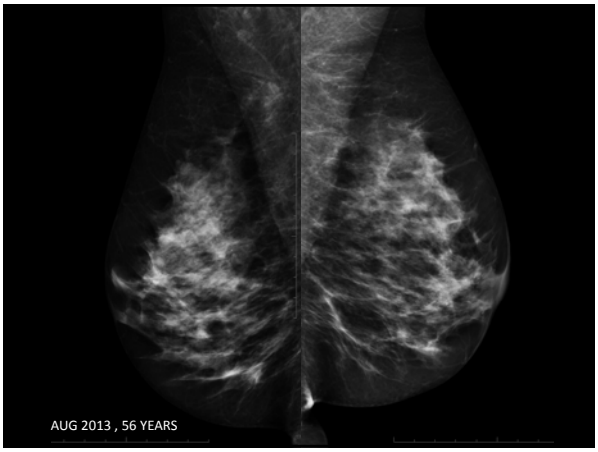
Q3question 3

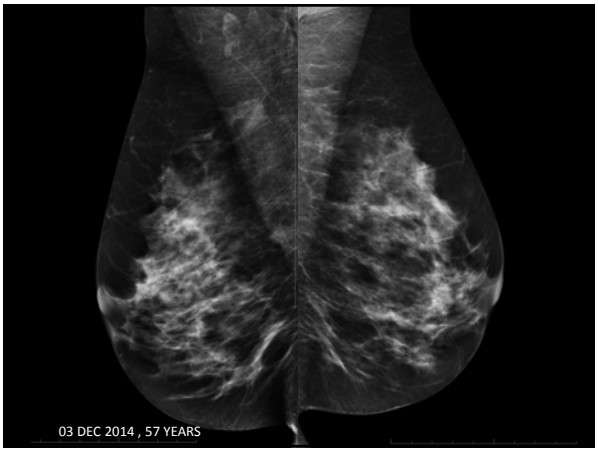
- A) True
- B) False

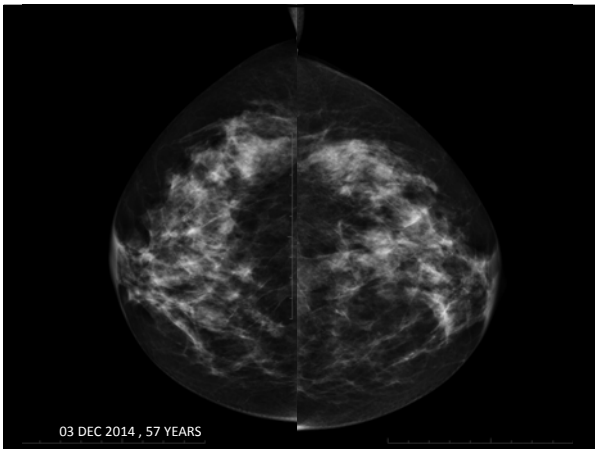
First MRI biopsy case

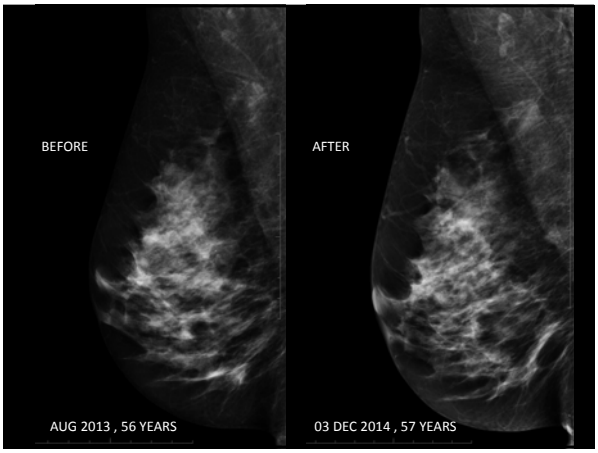
Everything starts on a routine screening average risk patient OBSP

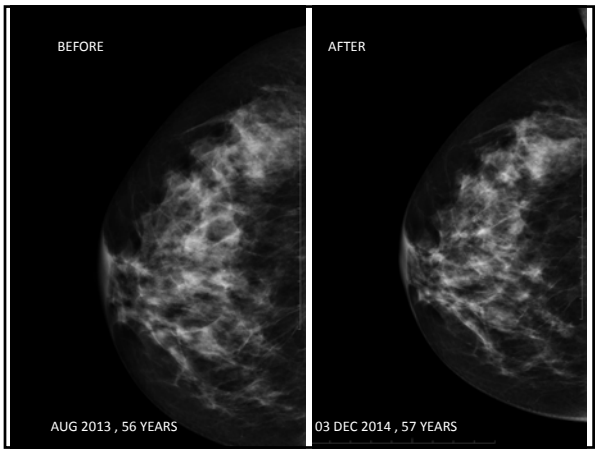












excluded

Rethorical question

2015 …many, many options

- ( ) spot compression views
- ( ) tomosynthesis
- ( ) targeted ultrasound
- ( ) whole breast ultrasound
- ( ) elastography
- ( ) MBI
- ( ) MRI

excluded

2015 … many options

- ( ) nothing (back to routine screening)
- ( ) second opinion (show it to a colleague)
- ( ) repeat spot
- ( ) repeat ultrasound
- ( ) tomosynthesis
- ( ) solving problem MRI
- ( ) 6 month follow-up mammo
- ( ) 6 month follow-up ultrasound
- ( ) 6 mo FU mammo&US

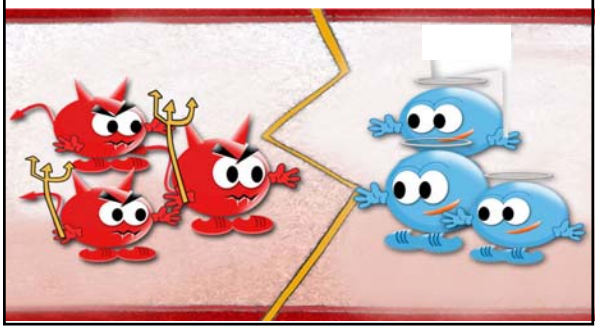
excluded

2015 …many, many options

- ( ) second opinion (show it to a colleague)
- ( ) obtain CC view (orthogonal planes)
- ( ) repeat spot compression views
- ( ) tomosynthesis
- ( ) repeat targeted ultrasound
- ( ) obtain whole breast ultrasound
- ( ) solving problem MRI

RESULTS, PLEASE

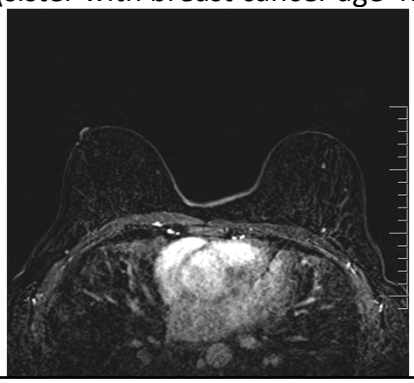
CANCER or BENIGN ?



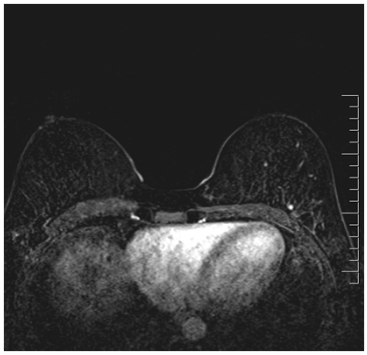
excluded

Second MRI biopsy case

46 years-old, baseline MRI
(sister with breast cancer age 47)



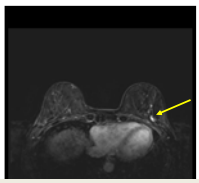
1 year later, 47 years-old



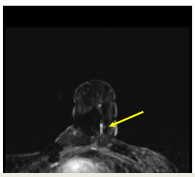
excluded

Positioning

- Depending on the position of the area of enhancement, the technologist may be required to rotate the patient to have this area moved away from the chest wall.



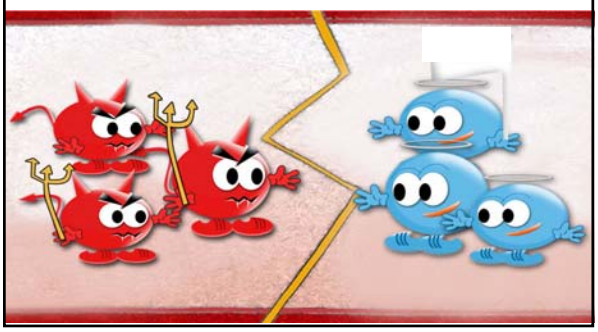
Diagnostic MR with the area of enhancement close to the chest wall.



Positioning of patient rotated medially to move the area of enhancement away from the chest wall.

RESULTS, PLEASE

CANCER or BENIGN ?



excluded

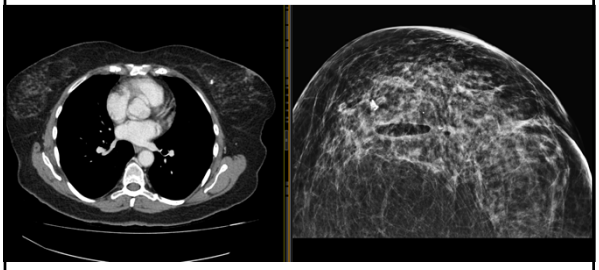
Characteristics and outcome of enhancing foci followed on breast MRI with management implications. Ha R, Sung J, Lee C, Comstock C, Wynn R, Morris E. Clin Radiol. 2014 Jul;69(7):715-20

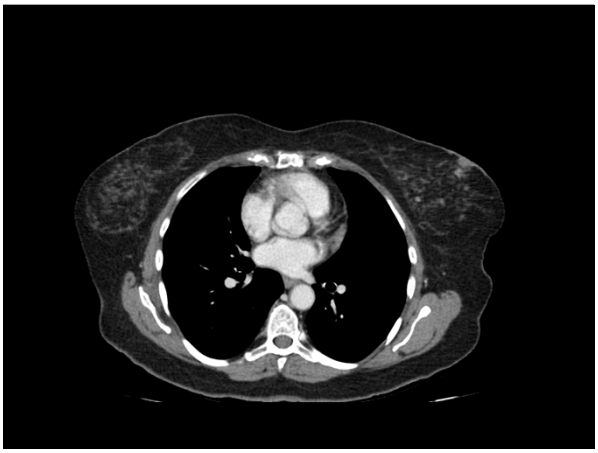
- 111 patients with 136 enhancing foci.
- Malignancy rate 2.9% [4/136, 95% CI: 0.9-7.6%].
- Kinetic analysis showed no statistical difference.
- Washout [5.1% (2/39)] vs Persistent [3.2% (2/62) NS
- T2 dark 8.7% (4/46); New focus 13.6% (3/22); Enlarging focus was 6.7%, (1/15).
- Combination New + T2 dark highest PPV for malignancy (27.2%, 3/11, 95% CI: 9.2-57.1%).

excluded

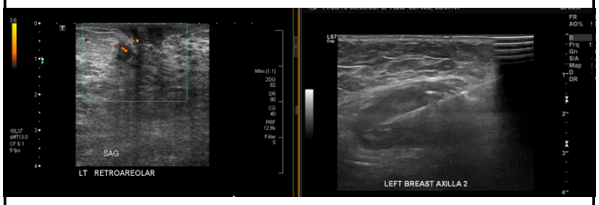
Third MRI biopsy case

Surgeon asked me to review the case prior surgery, 68 F, with palpable axillary nodes (malignant) left axilla





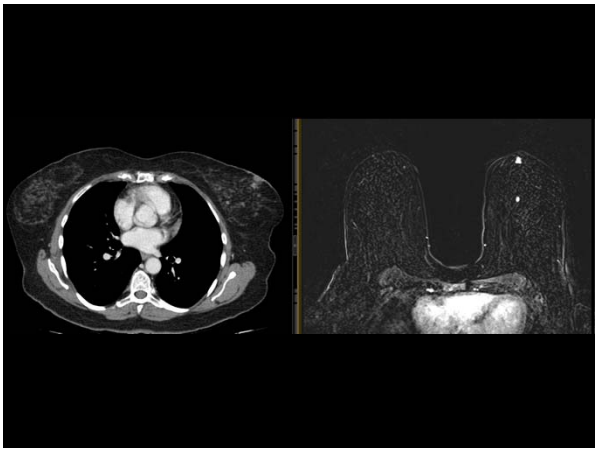
Can you guess the results of each lesion below too?



excluded

Rethorical question

CAN YOU BELIEVE IT?

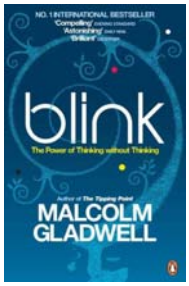


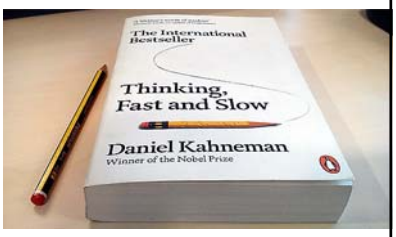
excluded

Rethorical question

excluded

How to choose the right one?





Brain forms thoughts
Daniel Kahneman, 2011

- **System 1: Fast, automatic, frequent, emotional, stereotypic, subconscious**
- **System 2: Slow, effortful, infrequent, logical, calculating, conscious**

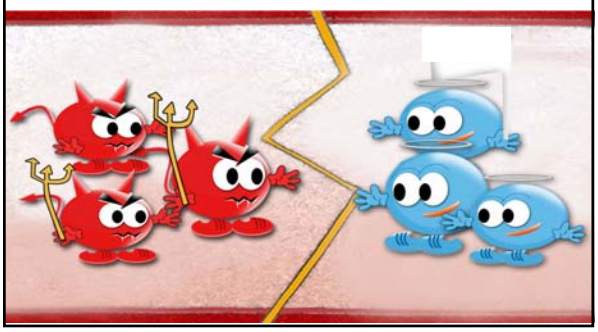
Coherence, attention, laziness, association, jumping to conclusions and how one forms judgments

Shleifer A. Journal of Economic Literature 2012, 50(4), 1–12
http://dx.doi.org/10.1257/jel.50.4.1

excluded

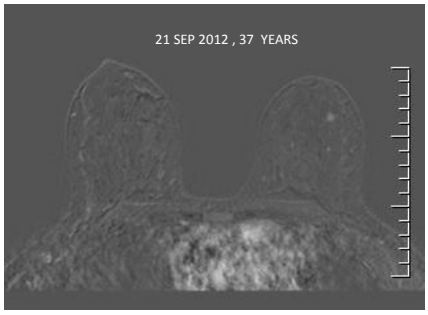
RESULTS, PLEASE

CANCER or BENIGN ?



excluded

4th case

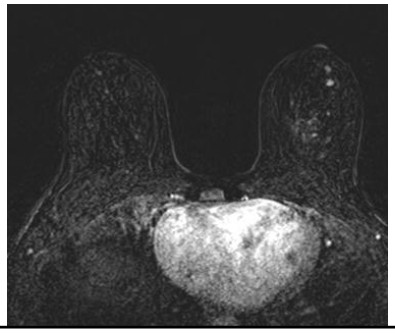


OUTSIDE MRI from Sep 2012 for 2nd opinion (consultation) almost a year later (June 2013) and a request for new MRI*

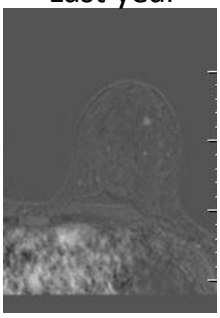
- 37 years
- Family history breast and ovarian cancer
- Lifetime risk 25% (not a carrier)
- Left breast benign biopsy Sep 2012 – 9-10 o'clock

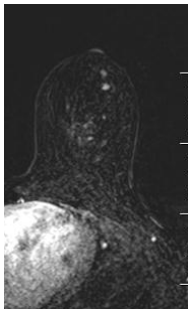
* "To be Enrolled on OBSP high risk in our institution"

June 2013



Last year current exam





Sep 2012 June 2013

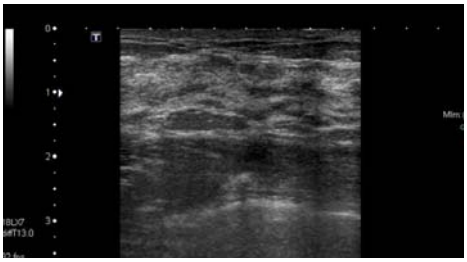
Rethorical question

2015 …many, many options

- ( ) normal exam, 1 year follow-up
- ( ) stable, routine follow-up
- ( ) second look ultrasound
- ( ) MRI-guided biopsy
- ( ) 6 month follow-up MRI
- ( ) Left mammography

excluded

Second Look US – June 2013 reported normal



Rethorical question

2015 …many, many options

- ( ) normal exam, 1 year follow-up
- ( ) stable, routine follow-up
- ~~( ) second look ultrasound~~
- ( ) MRI-guided biopsy
- ( ) 6 month follow-up MRI
- ( ) Left mammography

excluded

Rethorical question

2015 …many, many options

- ( ) normal exam, 1 year MRI follow-up
- ( ) marked BPE, 1 year MRI follow-up
- ( ) second look ultrasound
- ( ) MRI-guided biopsy
- ( ) 6 month follow-up MRI
- ( ) Left mammography
- ( ) Bilateral mammography

excluded

Second Look US – Feb 2014
no suspicious lesions

Rethorical question

2015 …many, many options

- ( ) normal exam, 1 year MRI follow-up
- ( ) marked BPE, 1 year MRI follow-up
- ~~( ) second look ultrasound~~
- ( ) MRI-guided biopsy
- ( ) 6 month follow-up MRI
- ( ) Left mammography

excluded

2015 …many, many options

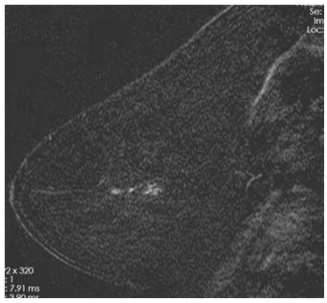
- ( ) normal exam, 1 year follow-up
- ( ) stable, routine follow-up
- ( ) persistent, second look ultrasound
- ( ) persistent, MRI-guided biopsy
- ( ) persistent, surgical excision
- ( ) another 6 month follow-up MRI

Reasons for refusing breast MRI screening : ACRIN 6666. N= 1215 (54.8 y) & 512 (42.1%) declined .

- 130 (25.4%) = claustrophobia;
- 93 (18.2%) = time constraints;
- 62 (12.1%) = financial concerns;
- 47 (9.2%)= MR imaging was not indicated;
- 40 (7.8%)= not interested;
- 39 (7.6%)= medically intolerant to MR imaging;
- 29 (5.7%) =did not want to undergo intravenous injection;
- 27 (5.3%), owing to additional biopsy or other procedures that might be required subsequently;
- 21 (4.1%), owing to MR imaging scheduling constraints;
- 11 (2.2%), travel required;
- 7 (1.4%), owing to gadolinium-related risks or allergies;
- 6 (1.2%), for unknown reasons

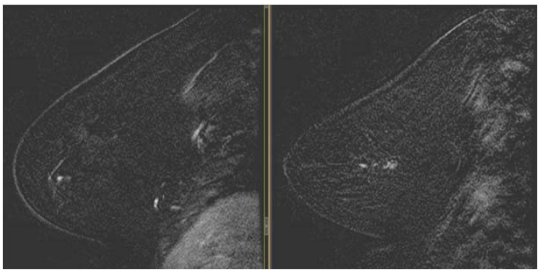
excluded

Case 5 MRI guided biopsy
65Y, F. Sister with Breast Cancer age 45.



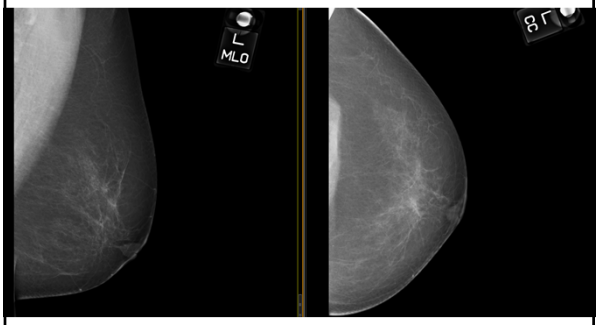
28 APR 2007

Case 5 MRI guided biopsy
RB normal. LB segmental area of dendritic enhancement at 3 o'clock position measuring 2.9 x 0.7 cm, 6 cm from the nipple.

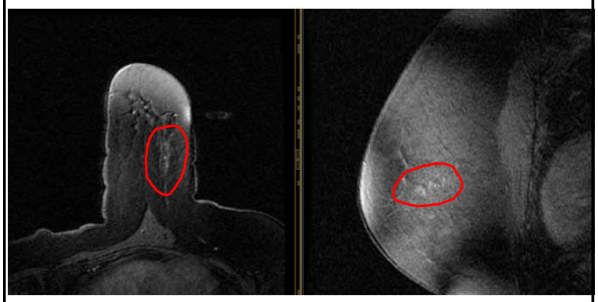


RIGHT SIDE 28 APR 2007 LEFT SIDE

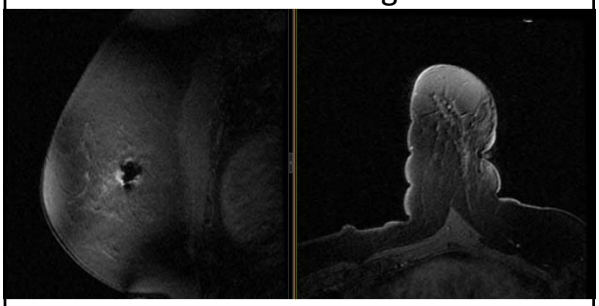
01- JUNE-2007



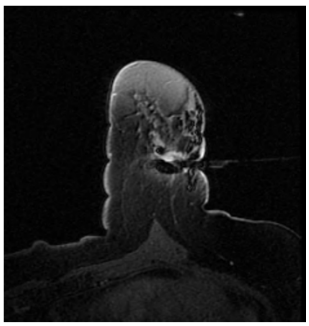
18 JUNE 2007 POST CONTRAST



18 JUNE 2007 - MRI guided bx

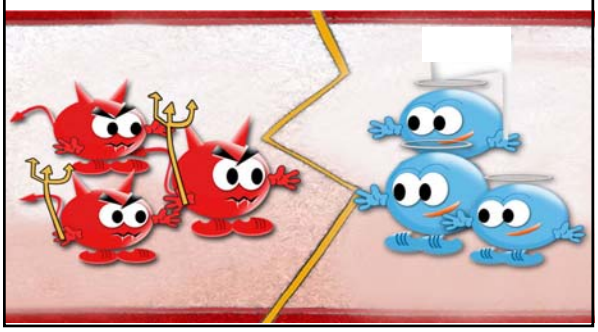


18 JUNE 2007 – POST CLIP



RESULTS, PLEASE

CANCER or BENIGN ?



excluded

The JAMA Network

From: **Diagnostic Concordance Among Pathologists Interpreting Breast Biopsy Specimens**

Elmore JG, Longton G, Carney PA, Geller B, Onega T, Tosteson ANA, Nelson HD, Pepe MS, Allison KH, Schnitt SJ, O'Malley FP, Weaver DL. JAMA. 2015;313(11):1122-1132. doi:10.1001/jama.2015.1405

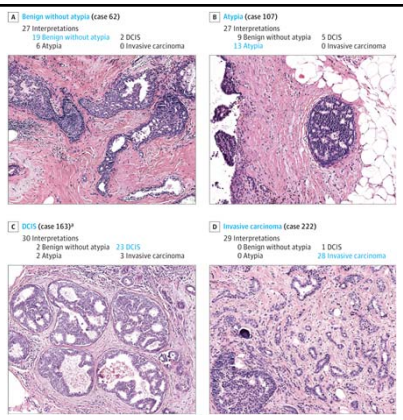
Consensus Reference Diagnosis[b]	Participating Pathologists' Interpretation				
	Benign without atypia	Atypia	DCIS	Invasive carcinoma	Total
Benign without atypia	1803	200	46	21	2070
Atypia	719	990	353	8	2070
DCIS	133	146	1764	54	2097
Invasive carcinoma	3	0	23	637	663
Total	2658	1336	2186	720	6900

Figure Legend:

Comparison of 115 Participating Pathologists' Interpretations vs the Consensus-Derived Reference Diagnosis for 6900 Total Case Interpretations[a]DCIS indicates ductal carcinoma in situ.

[a]Concordance noted in 5194 of 6900 case interpretations or 75.3%.

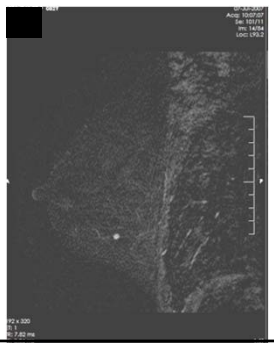
[b]Reference diagnosis was obtained from consensus of 3 experienced breast pathologists.



Elmore JG, Longton G, Carney PA, Geller B, Onega T, Tosteson ANA, Nelson HD, Pepe MS, Allison KH, Schnitt SJ, O'Malley FP, Weaver DL. JAMA. 2015;313(11):1122-1132. doi:10.1001/jama.2015.1405

Case 6 MRI guided biopsy
52y, High risk screening

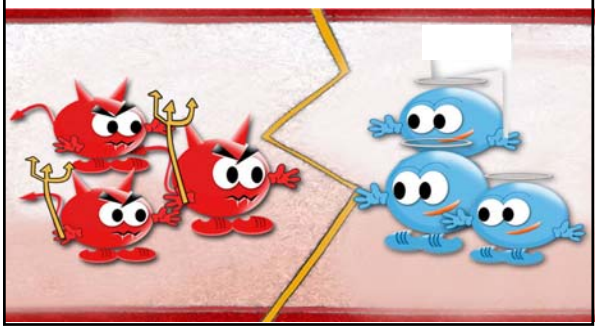
52y, High risk screening
negative SLU



excluded

RESULTS, PLEASE

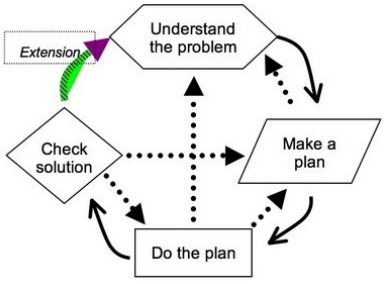
CANCER or BENIGN ?



What is your BIRADS ?

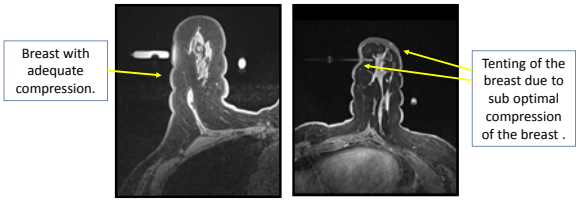
- Developing density on mammography
- Persistent nodularity on spot view
- Solid benign looking mass lesion on ultrasound
- High risk patient.

excluded



Positioning

- There is a significant amount of compression required to stabilize the breast. It may take a couple of sequences for the lesion to enhance.
  - If there is minimal compression, there may be significant tenting of the skin in that area – an option would be to use a scalpel to help decrease tenting of the skin.



TIP: Use lancet or scalpel

- Commercial available needles
  - Regular: 9 G; 20mm sampling window.
    - Trocar tip

  - Petite: 9 G; 12mm sampling window.
    - Blunt Tip

    - When using the petite, it is recommended that the number of samples taken is greater as each sample size is almost half of that with the regular.

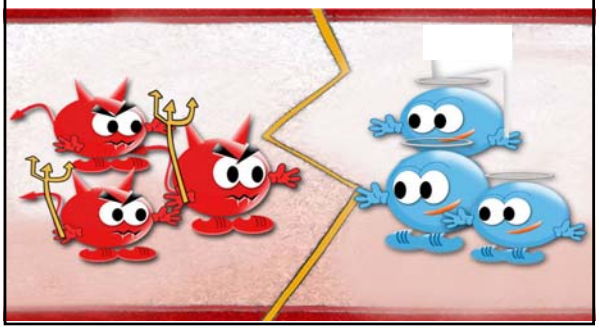
CASE 7

- HISTORY: 56y, F. Palpable lump in the left axilla for approximately 3 years with increase in size, pain and swelling in the right breast for approximately 3 months. Recently diagnosed with melanoma in the back. Personal history of a right lumpectomy 1998/1999 for malignant disease treated with radiation and chemotherapy.

excluded

RESULTS, PLEASE

CANCER or BENIGN ?



Thank you. Questions? Comments?

Anabel.scaranelo@uhn.ca