Early diagnosis of breast cancer

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Goals

- An update on breast screening
- Important clinical signs warranting an urgent referral
- Avoid inappropriate/non worked up referrals
The problem

- In 2009 there were 48,417 new cases of breast cancer in women in the UK, and 371 in men.

- Estimated risk at birth up to and including: UK (2008)
  - age 29  1 in 2,000
  - age 39  1 in 215
  - age 49  1 in 50
  - age 59  1 in 22
  - age 69  1 in 13

- Life time risk  1 in 8
The problem

- Worldwide accounts for 10.9% of all new cancers and 23% of all female cancers

- Female breast cancer incidence rates vary considerably, with the highest rates in Europe and the lowest rates in Africa and Asia.

- 11,556 women and 77 men died from breast cancer in 2010.

- The five-year survival rate for patients diagnosed 2001-2006 in England (period estimates) was 82%.

- The stage at which a woman has breast cancer diagnosed greatly influences her survival chances.

- In general, the earlier the detection, the greater the chance of survival.
NHS BSP Update (2012 Review)

- 2,862,370 screened (100k more than the year before)
- 73.4% uptake
- >17,000 cancers detected
- Marmot review published October 2012
- This has lead to the publication of a new information leaflet
- Age extension has been rolled out
- High risk screening has been updated
The Marmot report

- Independent breast screening review panel
- NHSBSP confers significant benefit and should continue!
- 20% relative risk reduction for a full 20 year programme
- 1,300 deaths prevented annually
- 4,000 cancers annually would not cause mortality

Marmot M et al. *The Lancet* 2012;380(9855): 1778-86
The new leaflet

NHS breast screening
Helping you decide

What is breast cancer? 2
What is breast screening? 3
Breast screening results 6
Making a choice - the possible benefits and risks of breast screening 9
What are the symptoms of breast cancer? 12
Who can I contact if I have a question? 13

The Royal Marsden
The new leaflet

- Explains what breast cancer is, what screening is and who is eligible

- Explains how long the results take and what the likelihood is of recall

- Explains the difference between invasive and non invasive cancer

- Touches on treatments

- Discusses risks vs benefits

- Explains the commonest symptoms of breast cancer
The age extension

- A randomised pilot involving over 1 million women

- 47-49 and 71-73. 50% of women selected from eligible screening units

- Women 47-49 can request a screen without an invite if they live in an area that has started the age extension

- Women over 70 can still request screening every 3 years by directly contacting their screening unit
Screening women out of hours

- Out of hours pilot study performed in 2010 in Bristol and Manchester
- 4 different timeslot groups, 18,000 women
- Largest uptake (slightly) was in the group with the option to change with only a few opting to do so
- Staffing, administrative logistical issues
## High risk surveillance

### High Risk Surveillance Imaging Protocols

<table>
<thead>
<tr>
<th>Ref</th>
<th>Risk</th>
<th>Ages</th>
<th>Surveillance Protocol</th>
<th>Frequency</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>a) BRCA 1 or b) BRCA2 carrier or c) not tested, equivalent high risk</td>
<td>20-29</td>
<td>n/a</td>
<td>Annual</td>
<td>Review MRI annually on basis of background density</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30-39</td>
<td>MRI</td>
<td>Annual</td>
<td>Review MRI annually on basis of background density</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40-49</td>
<td>MRI + Mammo</td>
<td>Annual</td>
<td>Review MRI annually on basis of background density</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50+</td>
<td>Mammo ± MRI</td>
<td>Annual</td>
<td>Review MRI annually on basis of background density</td>
</tr>
<tr>
<td>2</td>
<td>TP53 (Li-Fraumeni)</td>
<td>20-29</td>
<td>MRI</td>
<td>Annual</td>
<td>Review MRI annually on basis of background density</td>
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<td>Mammo ± MRI</td>
<td>Annual</td>
<td>Review MRI annually on basis of background density</td>
</tr>
<tr>
<td>3a</td>
<td>A-T homozygotes</td>
<td>25+</td>
<td>MRI</td>
<td>Annual</td>
<td>No mammography</td>
</tr>
<tr>
<td>3b</td>
<td>A-T heterozygotes</td>
<td>40-50</td>
<td>Mammography</td>
<td>18 monthly</td>
<td>Routine screening from 50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50+</td>
<td>Mammography</td>
<td>Routine</td>
<td>Routine screening (3 yearly)</td>
</tr>
<tr>
<td>4</td>
<td>Supradiaphragmatic radiotherapy-irradiated below age 25.</td>
<td>25-39</td>
<td>MRI</td>
<td>Annual</td>
<td>Surveillance commences at 25 or 8 years after first irradiation, whichever is the later</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40-50</td>
<td>MRI +/- Mammography</td>
<td>Annual</td>
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Criteria for referral to the Breast Clinic

- Patients with a new, discrete lump (any age)
- Altered breast contour / dimpling
- Persistent asymmetrical nodularity or thickening
- Persistent mastalgia which interferes with patient’s lifestyle
- Bloodstained, persistent or troublesome nipple discharge
- Recent nipple retraction or distortion
- Suspected Paget's disease of the nipple
- Breast abscess
The one stop breast clinic

- The diagnostic assessment of patients with breast symptoms is based on the Multidisciplinary Triple Diagnostic Method:

  - A. Clinical assessment
  - B. Imaging assessment
  - C. Needle biopsy

- The tests used in an individual case will be determined by the presenting symptom(s), the clinical findings and the age of the patient

- The assessment clinic should be organised so that all appropriate tests can be carried out during the same clinic attendance.

- Use of the Triple Diagnostic Method will enable a diagnosis to be established in the vast majority of patients.
Diagnostic categories

- P – clinical assessment, including physical examination
- M – Mammography
- U – Ultrasound

- P/M/U 1 = normal – biopsy not required
- P/M/U 2 = definitely benign – biopsy not usually required
- P/M/U 3 = indeterminate findings - biopsy often required
- P/M/U 4 = suspicious of malignancy – biopsy required
- P/M/U 5 = typical of malignancy – biopsy required
Interpretation is highly dependent on skill of the cytopathologist

Insufficient material retrieved for definitive diagnosis
- Cannot distinguish *in situ* versus invasive carcinomas
- Difficult to distinguish atypical ductal hyperplasia from low-grade DCIS or low-grade invasive ductal carcinoma
- **Core biopsy** is preferred rather than FNAC for solid lesions because of the higher sensitivity and specificity and because of the importance of oncological information including tumour type, grade and receptor status obtained with histology
Fine Needle Aspiration - Uses

- Lymph nodes
- Complex cysts
- (Where core biopsy not technically possible)
- (Clotting issues)
- (Local anaesthetic allergy)
- (Radiologically benign, young women)
Core biopsy

- Clinical/imaging work up should be completed before needle biopsy is performed

- Breast needle biopsies should be performed under imaging guidance (greatest accuracy and reduced the need for repeat procedures)

- Free hand core biopsy may be appropriate for cases in which the imaging is normal but there remains a suspicious localised clinical abnormality.

- Needle core biopsy and FNAC samples should be handled and reported (B1-5, C1-5) according to The Royal College of Pathologists tissue pathways guidance
Biopsy follow up

- In the event of a core biopsy referral to a breast surgical clinic is preferable to obtain the result.

- The breast team will be more experienced at interpreting the “unusual” aspects of a pathology report.

- Breast surgeons/radiologists/pathologists/nurses discuss all biopsies in a multidisciplinary team (MDT) meeting in order to ensure concordance of clinical/imaging/pathology findings

- In the event that a lesion needs surgical treatment, then aspects of treatment and timeline can be provided instantly
Symptomatic work up for under 25s

- Ultrasound if clinical concern

- Core biopsy not performed for all solid breast lesions (only if a lesion is radiologically indeterminate (U3-5))

- FNA can be performed for a cyst
Symptomatic work up for 25-39 years

- Ultrasound first as mammography is of little use in this age group (screening mammography will detect cancer in <0.5 per 1000 in under 40s)

- Mammography performed only if suspicious or malignant ultrasound findings (U4,5)

- Core biopsy all solid lesions (U2-5)
Symptomatic work up for over 40s

- Screening mammography
- Ultrasound
- Core biopsy based on findings from either mammography or ultrasound
### Summary symptomatic protocol

<table>
<thead>
<tr>
<th>Clinical sign / symptom</th>
<th>25 and under</th>
<th>26 to 39</th>
<th>40 and over</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lump (P2)</td>
<td>US (biopsy only if U3 – 5)</td>
<td>US and needle sample</td>
<td>Mammography, US and needle sample</td>
</tr>
<tr>
<td>Lump or localised thickening (P3 – 5)</td>
<td>US and needle sample (P3-5 consider mammography after US)</td>
<td>Mammography, US and needle sample</td>
<td></td>
</tr>
<tr>
<td>Skin change/dimpling or nipple distortion/inversion (P3 – 5)</td>
<td>US (P4/5 35-39y consider mammography after US)</td>
<td>Mammography and US</td>
<td></td>
</tr>
<tr>
<td>Diffuse thickening (P2)</td>
<td>No imaging</td>
<td>Screening mammography</td>
<td></td>
</tr>
<tr>
<td>Breast pain only</td>
<td>No imaging</td>
<td>Screening mammography</td>
<td></td>
</tr>
<tr>
<td>Nipple Discharge – multiduct</td>
<td>No imaging or cytology</td>
<td>Screening mammography</td>
<td></td>
</tr>
<tr>
<td>Nipple Discharge – single duct</td>
<td>No imaging - discharge cytology if blood positive</td>
<td>Mammography +/- US and discharge cytology if positive for blood</td>
<td></td>
</tr>
<tr>
<td>Nipple eczema – Paget’s</td>
<td>No imaging – clinical punch biopsy</td>
<td>Mammography and clinical punch biopsy</td>
<td></td>
</tr>
<tr>
<td>Gynaecomastia (P2)</td>
<td>No imaging</td>
<td>Ultrasound</td>
<td></td>
</tr>
<tr>
<td>Other male breast lump (P3-5)</td>
<td>US (and biopsy if U3 – U5) / Mammography not required</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

http://www.associationofbreastsurgery.org.uk/media/4585/best_practice_diagnostic_guidelines_for_patients_presenting_with_breast_symptoms.pdf
What about the private sector?

- Shorter wait times for seeing a consultant, having a scan, biopsy result

- Screening programme may be far more intensive

- More access to MRI scans (if required)

- Most units now running their own MDT meetings
Screening aged 40 to 50

- Limited evidence

- Based on the age trial (160k women) with single view analogue mammography, there is still a potential 24% mortality reduction*

- Large number of false positives

- No NHS funding for this

*Moss et al. Lancet. 2006 Dec 9;368(9552):2053-60
Breast Density

BIRADS I; Involuted background density
Breast Density

BIRADS II; Scattered fibro glandular densities
BIRADS III; Heterogenous background glandular density (arrow denotes a subtle cancer)
Breast Density

BIRADS IV; markedly glandular background pattern (arrow denoting a subtle cancer)
Case 1

- 40 year old woman with a 2 month history of unilateral breast pain.

- Clinical examination showed no discrete abnormality
What would you do?

1. Nothing
2. Mammography
3. Mammography and Ultrasound
4. Ultrasound
Case 1

- At the breast clinic we performed a screening mammogram only as our clinical examination was normal

- She was discharged with advice
Case 2

- 28 year old woman with a 2 month history of a discrete painless breast lump

- Clinical examination revealed a discrete mobile lump

- At the breast clinic we performed an ultrasound. The lump was solid and discrete
What is the likely diagnosis?

1. Breast cancer
2. Cyst
3. Fibroadenoma
4. Papilloma
Case 2

- We performed a core biopsy

- Fibroadenoma

- If the lump was cystic we would have aspirated it and discharged her on the day if uncomplicated
Case 3

- 65 year old woman with a 3 week history of nipple inversion

- No mass to feel clinically
What would you do?

1. Mammography
2. Mammography and Ultrasound
3. Mammography, Ultrasound and biopsy
4. Other
Case 3

- At the breast clinic we performed a mammogram and an ultrasound

- Mammogram and ultrasound both showed a spiculate mass lesion

- Core biopsy performed. Axillary ultrasound normal

- Diagnosis: Grade 2 invasive ductal carcinoma
Case 4

- 30 year old man with a 6 month history of thickening behind the left nipple

- Clinical examination shows a soft 2cm ridge of tissue that is not sinister

- Diagnosis: gynaecomastia
What would you do?

1. Nothing
2. Ultrasound
3. Ultrasound and biopsy
4. Other

- Nothing: 11%
- Ultrasound: 55%
- Ultrasound and biopsy: 34%
- Other: 0%
Case 4

- Testicular examination, drug hx, bloods
Case 5

- 51 year old woman with a 1 week history of skin redness and inflammation near her left nipple-areola complex

- Clinical examination shows a 3cm area of localised inflammation with no underlying palpable lump
What would you do?

1. Mammography
2. Mammography and Ultrasound
3. Skin biopsy
4. Other
Case 5

- Mammogram and ultrasound performed
- Both were normal
- Diagnosis: periductal mastitis
Case 6

- 55 year old woman with single duct blood stained nipple discharge

- No palpable lesion
What would you do?

1. Mammography
2. Mammography and Ultrasound
3. Ductal echography
4. Breast MRI
Case 6

- Mammogram and an ultrasound performed

- Mammogram was normal

- Ultrasound demonstrated a 6mm intraductal lesion at 7 o’clock

- Core biopsy performed

- Diagnosis: intraductal papilloma
Case 7

- 70 year old woman with a 1 month history of an axillary lump

- A 2cm mobile lymph node is palpable in the left axilla

- No chronic inflammatory illnesses or other acute symptoms
What would you do?

1. Mammography
2. Mammography and Ultrasound
3. Breast MRI
4. Mammography, Ultrasound, Axillary LN FNAC
Case 7

- Mammogram and breast ultrasound were normal
- Several pathological appearing left axillary lymph glands
- Fine needle aspiration performed
- Diagnosis: non hodgkins lymphoma (on subsequent node excision)
Conclusion

- Several recent developments in the NHSBSP and as a whole has been largely justified in the recent Marmot report

- More information now available to women wishing screening

- Symptomatic diagnostic protocols are now nationally established

- In practice the vast majority of patients are seen within 2 weeks with any breast symptom