

BREAST CARE SERVICES CLINICAL OPERATIONAL POLICY	Type: Register No: 10039 Status: Public
---	--

Developed in response to:	Improving Outcomes in Breast Cancer – National Institute for Health & Well Being
Contributes to CQC Outcome number:	9, 10, 12

Consulted With:	Post/Committee/Group:	Date:
	Breast Unit Consultants / Doctors	09/02/18
	OAFU CNS	09/02/18
	Deputy Superintendent Radiographer	09/02/18

Professionally Approved:		
Mr Simon Smith	Consultant Breast Surgeon	09/02/18

Version Number	3.0
Issuing Directorate	Surgery
Ratified by:	DRAG Chairman's Action
Ratified on:	10 th April 2018
Executive Management Board Sign Off Date	June 2018
Implementation Date	11 th June 2018
Next Review Date	March 2021
Author/Contact for Information	Carolyn Ollenbuttel
Policy to be followed by (target staff)	All Staff
Distribution Method	Intranet & Website
Related Trust Policies (to be read in conjunction with)	Mandatory Training Patient Access Policy Interpreting & Translation Policy

Document Review History:

Version No:	Reviewed by:	Issue Date:
1.0	Carolyn Ollenbuttel	11th March 2010
2.0	Carolyn Ollenbuttel	20th November 2014
3.0	Carolyn Ollenbuttel	11 th June 2018

Index

1. Purpose
2. Aims of service
3. Scope of the service
4. Key Services Provided
5. Staff (Symptomatic Service) (see staffing table section 8.)
6. Workflows
7. Key Relationships
8. Staffing
9. MDT Function
10. Co-ordination of Care/Patient Pathways
11. Training & Education
12. Patient Communication
13. Written Information for Patients
14. Equipment Requirements
15. Contingency
16. Auditing & Monitoring
17. Responsibilities
18. References
19. Appendices

Appendix 1:	Work Flow – One Stop Breast Clinic
Appendix 2:	Work Flow – Breast Screening
Appendix 3:	Work Flow - All Breast Care Nurse Clinics & Prosthesis, Lymphoedema & Breast Pain Clinics
Appendix 4:	Work Flow - Localisations
Appendix 5:	Work Flow - Follow Up Clinics
Appendix 6:	Work Flow - Results Clinic
Appendix 7:	Work Flow - Seroma Clinic
Appendix 8:	Emergency Flow - Breast Abscess
Appendix 9 :	Elective Admissions Pathway

1.0 Purpose

- 1.1 To outline the purpose and function of breast services at MEHT.
- 1.2 To outline the purpose of the National Health Service Breast Screening Programme (NHSBSP) for women aged 47 - 73.

2.0 Aims of the Service

- 2.1 This is to screen, diagnose, treat, forward to and discharge all patients with benign disease and breast cancer.
- 2.2 To plan, with the patient, treatment for breast cancer. This would be a combination of surgery, radiotherapy chemotherapy & hormone therapy.
- 2.3 To see patients with benign breast disease and treat or discharge as necessary.
- 2.4 To provide a family history screening programme for eligible women aged under 50.

3.0 Scope of the Service

- 3.1 The Breast Unit will treat all symptomatic patients from MEHT and a joint breast screening service from MEHT & CHUFT (Colchester Hospital).

3.2 Hours of Operation

08.00 – 17.00 service, Monday to Friday

3.3 Inclusions

- New patient clinics
- Surgical follow up clinics
- Oncology follow up clinics
- Results clinics
- Nurse led clinics (breast pain / family history / research)
- Breast prosthesis clinics
- Arm lymphoedema clinics
- Breast screening clinics

- 3.4 Exclusions - none

4.0 Key Services Provided

- 4.1 One stop specialist / multidisciplinary specialist breast clinics where women are seen and assessed for their breast problem (see appendix 1).
- 4.2 Breast pain clinics where women are seen by a Breast Care Nurse and where advice and support is given, and a clinical examination and a mammogram is arranged if they are over 47 and not had one in the last 12 months.(see appendix 3)
- 4.3 NHS Breast Screening Service (NHSBSP) – This is for women aged 47 – 73, they are invited to attend for a mammogram every three years (see appendix 2).

- 4.3 **Breast Screening Assessment Clinic** - In this clinic women who have been screened through the NHSBSP are recalled if there is an abnormality on their mammogram. They will be re assessed by a Consultant Radiologist, the patient may have had the mammograms repeated. The mammograms will be read by the Consultant Radiologist, then the patient will be seen by the Consultant Radiologist, results of the mammogram explained, a clinical examination will be carried out, an Ultrasound scan and biopsy will be performed if necessary. All results will be explained to the patient in the presence of the breast screening nurse. The nurse will then discuss this further with the patient in a separate room (see appendix 2).
- 4.4 **Breast imaging, ultrasound and mammography** - these are carried out as part of a clinic (see appendix 4).
- 4.5 **Prosthesis and lymphoedema clinics** - These are nurse led clinics where patients who have had cancer are seen to have an external breast prosthesis fitted or to have their arm lymphoedema assessed and managed (see appendix 3).
- 4.6 **Family history clinics** - This is a nurse led clinic for women with a family history of breast cancer who are moderate to high risk patients. The nurses take a full assessment of the family history and explain the individuals risk to them and discuss breast awareness with them. They will also arrange for them to be entered into the family history screening programme. This will involve the patient attending the breast unit for a mammogram every two years until the age of fifty. High risk patients are managed by the Chelmsford & Colchester Breast Screening service, where they receive (NHSBSP) annual mammography +/- MRI depending on the breast density.
- 4.7 **Genetics clinics** - This clinic is held every two weeks by a Genetic Counsellor and once a month by the Genetic Consultant – This service is provided by Great Ormond Street Hospital but held at the Breast Unit for convenience for the patients.
- 4.8 **Localisation of impalpable lesions prior to surgery** - This technique is carried out prior to an operation being performed. It is required for all impalpable lesions. The woman arrives at the Breast Unit at either 0800 on the day of her operation. She will be seen by a Breast Care Nurse prior to the procedure to ensure she understands what is going to happen. She will then be taken to the x-ray room where either a mammogram or an ultrasound scan will be performed and a mark will be placed on her skin or a marker wire will be inserted to her breast. She will then have a mammogram repeated to ensure the wire is in the correct place. She will be taken to ward by a member of the breast team.
- 4.9 **Vacuum excision of benign lesions**
- 4.10 **Research clinics** – There is a team of research nurses who enters patients into clinical trials, they will provide the information about the trial to the patient and enrol them if they wish to participate. They will monitor the patient throughout the length of the trial. They will either have their own nurse led clinics or see the patients following a Consultant consultation.
- 4.11 **Open Access Follow Up (OAFU)** – This is a nurse led service for all patients with breast cancer diagnosis on completion of treatment (patients on primary AI treatment, those with capacity issues and those with secondary disease are exempt from OAFU).
- They are seen by the OAFU CNS who will review their diagnosis and treatment; discuss lifestyle issues such as weight management, exercise, smoking cessation,

alcohol consumption reduction and bone health; discuss continuing medication therapy (if appropriate) and how to access care and support over the five year follow up period including mammographic surveillance.

- They will be given a written treatment summary which will be copied to the GP.
- All patients will be asked to complete a holistic needs assessment prior to the appointment and this will be discussed in detail, during the consultation. Appropriate referrals will be made to other members of the MDT or other care/support agencies/charities as needed.
- Patients will also be given information to how to enrol on Breast cancer Care Moving Forward courses.
- Patients are referred to OAFU by the Consultant Surgeon or Consultant Oncologist at the end of their treatment.

5.0 Staff (Symptomatic Service) (see staffing table section 8.)

- Lead Nurse (50% Clinical 50% Managerial)
- Clinical Nurse Specialists
- Staff Nurse
- Health Care Support worker
- Radiographers
- Assistant Practitioners
- Imaging assistant
- Data co-ordinator / admin assistant x 2
- Screening admin assistants
- The NHSBSP radiographers cover the symptomatic service – this is not funded by MEHT but by CHUFT.

6.0 Work Flows

6.1 One stop Breast Clinic (see Appendix 1)

- Patients are referred to the clinic from their GP, some will have appointments booked via the choose & book system
- They are telephoned / sent an appointment to attend clinic
- On arrival they book into reception and then take a seat in the waiting room
- The volunteer / admin assistant takes the medical notes & takes them to sit in the second waiting room
- The radiographer will take the notes and if appropriate performs a mammogram
- Once the mammogram is reported the notes are taken to the ultrasound room, if no mammogram is required the notes are taken to the ultrasound room
- The patient is called in by the radiographer / nurse to see the Consultant Radiologist & Surgeon
- The patients medical history is recorded and this is followed by a clinical examination, ultrasound scan and needle / core biopsy if required

- If a biopsy is carried out and a cancer is suspected, the Breast Care Nurse (BCN) will be asked to come to the clinic room. Once the patient is dressed, the BCN will take the patient to another room along with their relative. The Consultant will explain the diagnosis to the patient and relative. The BCN will then support them and arrange the results clinic appointment and the patient will leave the department
- If a biopsy is carried out and no cancer is suspected, the patient will get dressed, leave the clinic room and book a results clinic appointment.
- If no biopsy carried out the patient can leave the room and get dressed and leave the department.

6.2 **Breast Screening (See Appendix 2)**

- Invited by letter to attend for breast screening
- Reports to breast unit reception
- Shown by volunteer or admin staff to changing room
- Once changed takes a seat in waiting room
- Radiographer/ Assistant Practitioner takes woman to mammogram room and performs mammogram
- Radiographer/Assistant Practitioner informs woman she can leave
- Woman gets dressed and leaves department

6.3 **Breast Screening Assessment Clinic** (Refer to Appendix 2)

All women will have had their case discussed at the breast screening MDT the morning of their assessment visit

- Letter recalling them to assessment clinic
- Reports to breast unit reception
- Takes a seat in the waiting room
- Radiographer will perform additional mammograms if required
- Mammograms taken to radiologist in ultrasound room
- Woman called in to see radiologist by nurse/radiographer
- Clinical examination, ultrasound and biopsy performed if necessary
- Radiologist explains results to woman

- Screening nurse escorts woman to clinic room to discuss the outcome of appointment and book biopsy results appointment if necessary
- Leaves the department

6.4 **Nurse Led Clinics** (Refer to Appendix 3)

- Referred by GP, clinic or self
- Appointment booked
- Arrive at breast unit, report to reception
- Wait in the waiting room
- Seen by nurse, breast prosthesis fitted or lymphoedema assessed & garment fitted.
- Book a follow up appt at reception if necessary
- Leave the department

6.5 **Localisation** (Refer to Appendix 4)

- Reports to breast unit reception
- Waits in the waiting room
- Seen by Breast Care Nurse (BCN) discussion re procedure, documentation completed
- Taken by nurse/radiographer to changing room
- Waits in the waiting room
- Taken by radiographer to ultrasound room or mammogram room
- Localisation performed, secure dressing placed over wire
- Mammogram repeated
- Dressed and waits in waiting room to be escorted to ward by a member of the breast care team.

6.6 **Follow Up Clinic** (Refer to Appendix 5)

- Report to reception
- Waits in the waiting room

- Called by nurse to see Consultant
- Reception to book follow up appointment if required
- Leave the breast unit

6.7 **Open Access Follow up clinics (OAFU)**

- Report to reception
- Waits in the waiting room
- Called & seen by CNS
- Leave the breast unit

6.8 **Results Clinic** (Refer to Appendix 6)

- Report to reception
- Waits in the waiting room
- Called by nurse to see Consultant, results given

6.9 **Benign results**

- Reception to book follow up appt if required
- Leave the breast unit

6.10 **Cancer result**

- Treatment planned, surgery, chemotherapy or hormone therapy
- Leaves with Breast Care Nurse (BCN) to another room to discuss treatment plan, written and verbal information given.
- BCN books follow up appointment if required
- Leaves the breast unit

6.11 **Seroma Clinic** (Refer to Appendix 7)

- Report to reception
- Waits in the waiting room
- Called in to see breast care nurse
- Undress in clinic room, seroma drained, redress

- Leave the breast unit

6.12 Emergency Flows

Patients with Breast Abscess

(Refer to Appendix 8)

- Referred by GP to A&E or by GP direct to Breast Unit/consultant
- Seen in Breast Unit next Onestop clinic or same day if Consultant available
- Clinical examination & Ultrasound scan performed
- Abscess drained
- Follow up appointment booked in reception
- Leaves the department with Breast Care Nurse Contact number

6.13 Elective Flows

(Refer to Appendix 15)

- Patient given date of operation
- Patient given information to ring and book pre-assessment appointment
- Operation booked with waiting list dept, letter sent to patient
- Admitted to hospital for surgery either in patient or day stay patient
- Seen on ward by BCN, follow up appointment given
- Surgery performed
- Discharged from hospital

7.0 Key Relationships

7.1 The Breast Unit requires ease of access to IT, pathology, radiology and phlebotomy services, reconstructive / plastic surgery team, chemotherapy team.

7.2 Key Operational Requirements

- Separation of screening and symptomatic workloads
- National requirement for Breast Screening to have a dedicated suite with interview rooms
- The overall appearance and ambience of the breast unit must be non-clinical, calm and friendly

- Child friendly (accompanying mothers). Must be compliant with children's NSF
- Women attending for screening are essentially 'well' and should be appropriately separated
- Access to a local laboratory
- Flexibility of accommodation to reflect workload
- Patients should only get undressed once during the process
- Good access to car parking
- Patient's notes and mammograms at Breast Unit for clinic, need to have good working relationship with medical records staff
- Data security and records management, all staff need to be aware of this

7.3 Key Relationship with other Departments

- Plastics
- DSU
- Theatre
- Chemotherapy & Radiotherapy teams
- Broomfield Hospital staff
- Medical records staff
- Nurses on ward
- X-Ray
- Nuclear Medicine Department
- Oncology Team

7.4 Key Requirements for Facilities Management (F.M.)

- Cleaners – Once a day in the evening
- Transport – twice a day, once in the am and once in the pm
- Support from Ecover for maintenance of dept
- Support from Estates for servicing of equipment
- Mammogram servicing twice a year by GE (external company)

- Ultrasound machine serviced twice a year

7.5 **Environmental Requirements**

The overall appearance and ambience of the breast unit must be non-clinical, calm and friendly

7.6 **Way Finding**

- Clear defined departmental signage from the reception
- Written directions are provided to the patients for more complicated journeys

7.7 **Security Requirements**

Data Security

- The service will be delivered in accordance with and compliance to the Trust's IT Policies
- Data sharing agreements will be drawn up to cover all data sharing outside the Trust in accordance with the Trust data sharing policy
- Hospital information / patient data will only be downloaded onto devices provided by the Trust which are encrypted
- Databases will be registered on the Trust database of databases
- A data mapping form will be completed for all routine data flows leaving the Trust
- Patient identifiable information will only be sent out of the Trust from an nhs.net account or other secure route (never from an nhs.uk account)
- Out of hours the unit should be made secure
- All doors must be lockable

7.8 **Security for Patients**

- The service will be delivered in accordance with and compliance to the Trust's Patient Safety Policies
- All staff must be screened through HR for CRB check.
- All staff must wear name badges and carry Trust ID.
- All patients are chaperoned according to the Trust Policy

7.9 **Security for Staff**

- The service will be delivered in accordance with and compliance to the Trust's Lone Worker and Security / Risk Management Policies

- Security for Patients and Staff – when necessary, Trust based security is available for patients and staff via the emergency phone / bleep numbers

7.10 Medical Records Security

- All patients medical records will be managed confidentially at all times and stored securely in locked office or outpatient facility whilst not in use
- All movement of patient records will be accurately tracked in accordance with the Trust's Case note Tracking Policy
- All new documentation will be secured into the folder prior to it leaving the department

8.0 Staffing

8.1 Symptomatic Staff

STAFF	GRADE	WTE
Lead Nurse	8A	1.0
Senior Breast Care Sister	7	1.0
OAFU CNS	7	0.8
Breast Care Sisters	6	3.0
Staff Nurse	5	0.6
Health Care Support Worker	3	0.47
Health Care Support Worker	2	1.2
Radiographers	6	0.4
Admin support / Data Co-ordinator	3	3.13

The shortfall in radiographer cover for the symptomatic service is provided by CHUFT

8.2 Core Breast MDT Membership

	Core members	Named Cover
Breast Surgeons	Mr Simon Smith (lead) Miss Sascha Dua Miss Gill Clayton Miss Tasha Gandamihardja	All of core members
Oncologists (clinical & medical)	Dr Sunil Skaria (locum)	Dr Eamon Ramadan (Locum)
Radiologists	Dr Roger Whitney	Dr Sanjay Kavia
Breast Care Nurse Specialists (Service improvement lead).	Carolyn Ollenbuttel (Lead) (Level 2 psychological support training) Moirra Gray (Responsible for users issues & patient information) Heidi Barclay Gemma Smith Kieva Noble Emma Mitchell	All of the core members
Histopathologists	Dr Peter Davis	Dr Sarah Lower

	Both have their EQA certificates)	
MDT Co-ordinator	Sue Anderson	Tom Devenish
Research Nurses (recruitment lead for clinical trials)	Sian Gibson	Tracey Camburn

8.3 Extended Breast Membership

Macmillan Radiographers	Kier Williamson
Palliative Care Nurse Specialist	Wendy Pearson
Bereavement Counsellor	No person
Plastic/Reconstructive Surgeons	Mr Ramakrishnan Miss Morgan
Genetics Counsellor	Vanessa Miller
Psychiatrist - Psychotherapist	
Social Worker	No person
Physiotherapist	Debbie Snell

8.4 Screening Staff

A team of radiographers are provided by CHUFT (Colchester Hospital University Foundation Trust) to provide this service. The National Health Service Breast Screening Programme is a combined service with Chelmsford and Colchester providing one service. CHUFT is the host trust.

9.0 The MDT Function

- 9.1 The MDT is a team of specialised clinicians working collaboratively to ensure a co-ordinated approach to treatment and care pathways for all patients diagnosed with breast cancer or pre-malignant disease. Any complex benign cases are discussed as well as management of recurrence and metastatic disease where appropriate.
- 9.2 The MDT should discuss a minimum of 100 new breast cases per year with individual breast surgeons should treat a minimum of 30 new cases per year and all core consultants (surgeons oncologists, histopathologists and radiologists) should spend at least 50% of direct clinical care sessions on breast work. All five breast care nurses spend at least 80% of their time on breast cancer.
- 9.3 The breast team meets weekly with either named leads or individuals that have been identified to cover. The MDT is a local discussion at the Breast Centre. The meetings are chaired by the Lead clinician or cover in his absence.
- 9.4 All patients with suspected breast cancer are discussed at the MDT following the clinic appointment, after surgery and after any investigations. All patients who have core biopsies, any C3 cytology results and any discrepant triple assessment patients are also discussed.
- 9.5 Any patient who needs treatment prior to the next MDT will be discussed individually by the surgeon with the radiologist, oncologist and histopathologist
- 9.6 The attendance at all meetings is recorded and is attached at appendix 1.
- 9.7 The core MDT members agree and record individual patient treatment plans in accordance with IOG guidelines.

- 9.8 A record of all patients discussed is kept in addition to the treatment plans.
- 9.9 The current system is the Somerset system. The team started using this June 2013 and find it a useful system for the MDT.
- 9.10 It is rare for there to be referrals which need treatment planning prior to the next MDT but if there is a referral it would be discussed with the team on an individual basis.
- 9.11 **Workload** - between 350 and 400 new breast cancers every year. Please see details in annual report.

10.0 Co-ordination of Care / Patient Pathways

- 10.1 The service follows the network agreed guidelines for referrals, imaging, pathology and follow up, although there may be some variations at each unit. This is all documented in the network guidelines.
- 10.2 NSSG have agreed clinical and referral guidelines which the team adhere to. The NSSG also have agreed diagnosis assessment imaging and pathology guidelines which the team adhere to.

11.0 Training and Education

- Mandatory training for all staff
- All breast care nurses will have the advanced breast care nursing qualification
- All medical & nursing team will have undergone the advanced communication training
- All radiographers will have a mammography qualification

12.0 Patient Communication

- 12.1 All patients diagnosed with breast cancer will be given a key worker, this is either the Lead Nurse for Breast Care or a Breast Care Sister.
- 12.2 All patients that attend breast cancer clinics and nurse led clinics are offered a summary of the clinic consultation.
- 12.3 All patients and their carers are provided with clear and comprehensive verbal and written information (patient folder). They will have the opportunity to discuss their condition with key members of the MDT.
- 12.4 Following surgery, at the time of discharge, the date for the first outpatient follow up appointment will be given to the patient prior to leaving the hospital.
- 12.5 If they have been treated as a day case, the Breast Care Nurse will contact them the next day to inform them of their outpatient appointment.
- 12.6 The Breast Care Nurse Specialists are the co-ordinators for patient information and, therefore, responsible for quality assurance of all the information given to the patients.

12.7 It is the responsibility of the Breast Care Nurse Specialist to ensure that user issues are addressed and that written information is produced in partnership with user groups. Standards will be maintained through annual audit / patient survey. Patient information will be regularly reviewed and updated.

12.8 All patients with breast cancer will have access to a user support group based at the Helen Rollason Centre. This group meets once a month, third Wednesday, and is run by patients for patients with the support of the Breast Care Nurse Specialists. The group offers support and information. Patients with wish to participate can contact the Breast Care Nurses or the Helen Rollason Centre. Information will also be provided in the patient information folders.

13.0 Written Information for Patients

13.1 Patients will receive information folders and will include information on cancer in general and on breast cancer. Specifically:

- Surgical procedures
- Treatment options
- Risk of lymphoedema
- Pre and post operative care
- List of MDT members

13.2 They will also receive appropriate booklets produced by Breast Cancer Care.

13.3 Written & verbal information regarding fertility will be given to younger women.

13.4 It is recognised that all patients should have access to verbal and written information about cancer and their condition. Not all patients speak English or are able to hear, see or read. In Mid Anglia this is faced less often than other networks where cultural diversity is more widespread. However all patients and carers will have access to translation services for verbal & written information (refer to the Trust's Interpreting & Translation Policy. If more specialist information is required, this will be produced on a patient-to-patient basis.

14.0 Equipment Requirements

- Mammogram machine & equipment x 2 (GE Seno Essentials)
- IDI reporting work stations x 2
- Reporting work station x 1
- Ultrasound machine x 3 (Phillips iu22, XVISION – MYLAB 70 ESOATE)
- Stereo tactic Biopsy kit (Siemens)
- Vacuum assisted biopsy machine (Bard Encor Enspire)
- Multiviewers x 2 (MAMMOLUX PLANILUX – Southern Scientific)
- Microscope
- Computers
- Printers – Office areas, reception, imaging room, meeting room
- Telephones – All consulting rooms, offices, reception, meeting room
- Interactive wipe board – Meeting room
- Projectors x 2 – Meeting room

15.0 Contingency

15.1 Adverse Weather Conditions

- Clinics will run as normal as long as staff can get into work.
- Extra clinics will be arranged for those cancelled

15.2 Power Failure

- Cancel clinics as no back up generator
- Extra clinics will be arranged for those cancelled

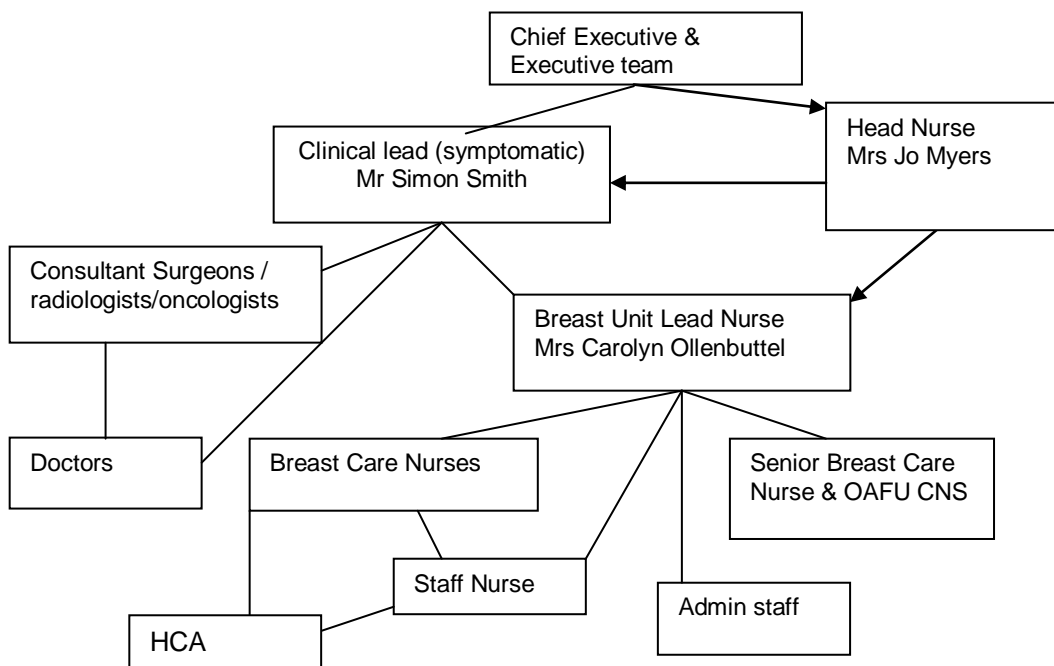
16.0 Auditing & Monitoring

16.1 Breaches of this operational policy that lead to harm to patients will be reported on a risk event form. All risk events will be discussed within the breast unit team.

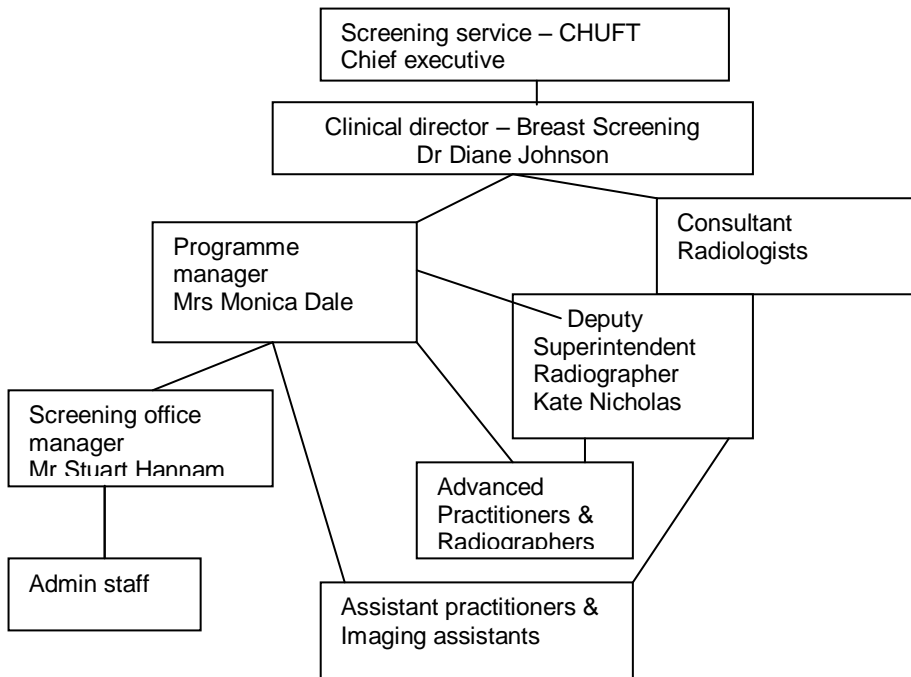
16.2 The service report will be audited once a year, if any changes in capacity are require, this will be discussed with the breast unit team and the general manager for surgery and urology

17.0 Responsibilities

17.1 Breast Unit Management Team (Symptomatic Service)



17.2 Breast Unit Management Team (Screening Service)



18.0 References

The NHS Cancer Plan - Sept 2001

Cancer Reform Strategy

Improving Outcomes in Breast Cancer – National Institute of Clinical Excellence (NICE)

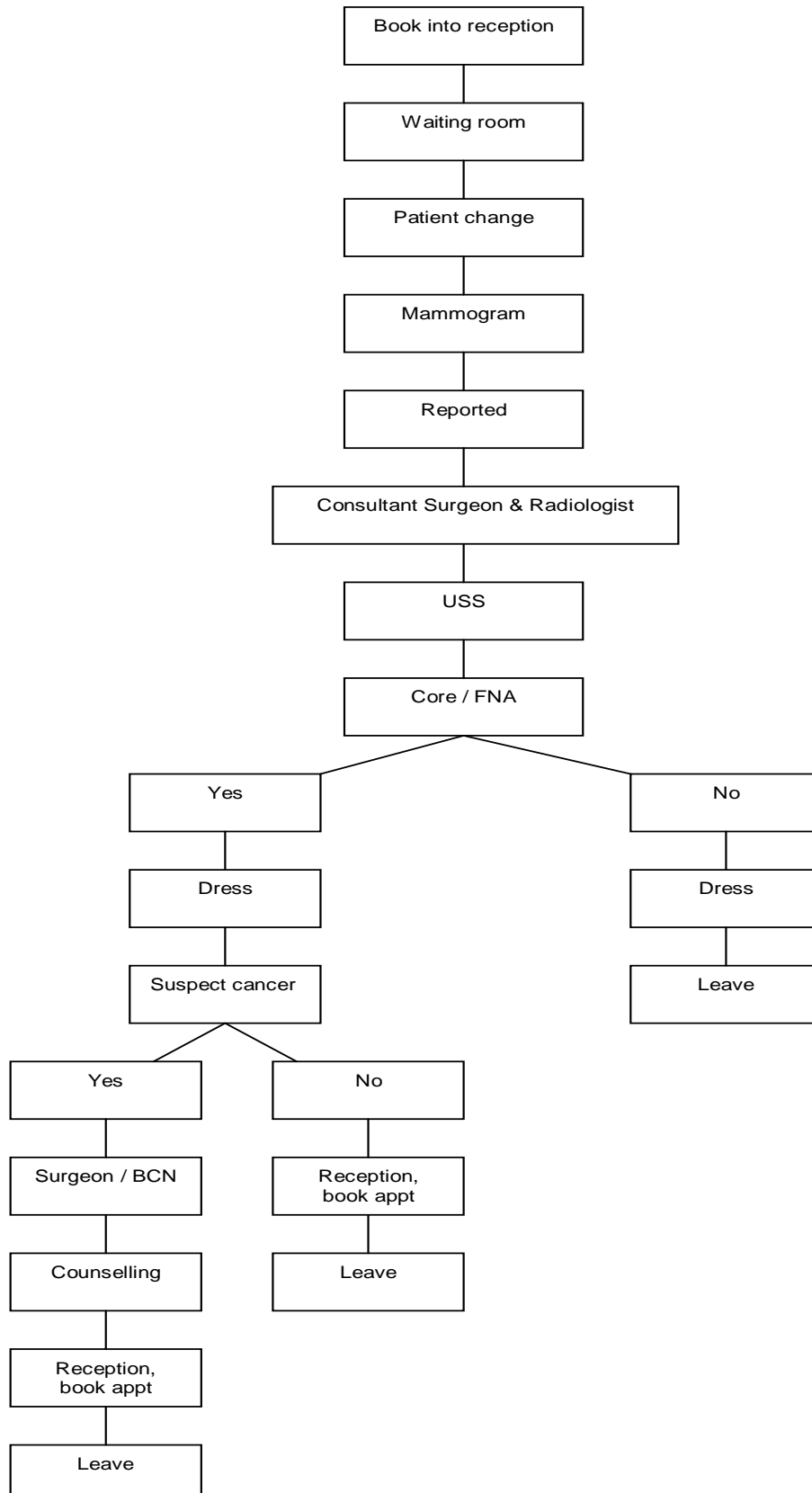
Appendix 1: Work Flow – One Stop Breast Clinic

USS = Ultrasound

FNA = Fine needle aspiration

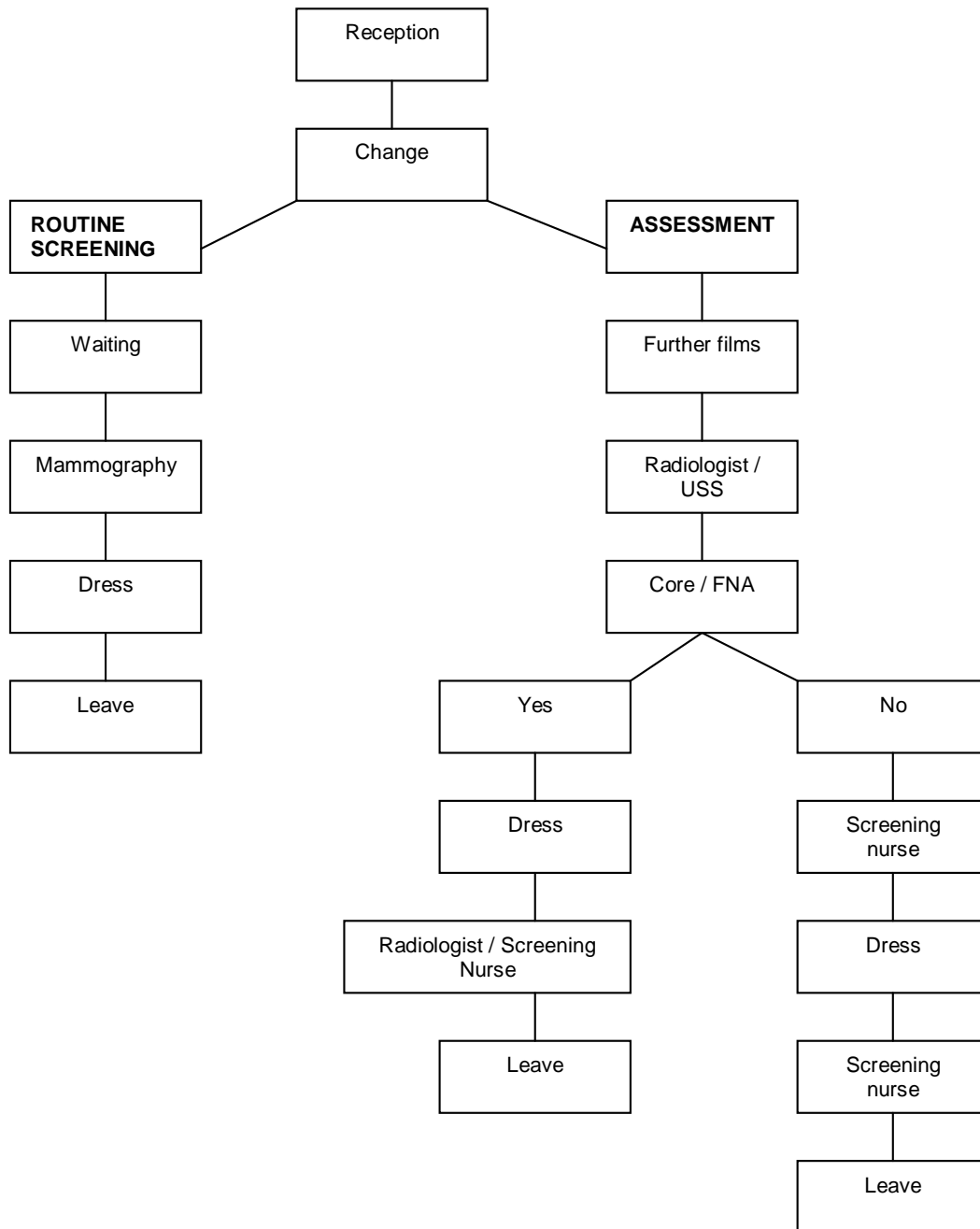
BCN = Breast Care Nurse

ONESTOP BREAST CLINIC

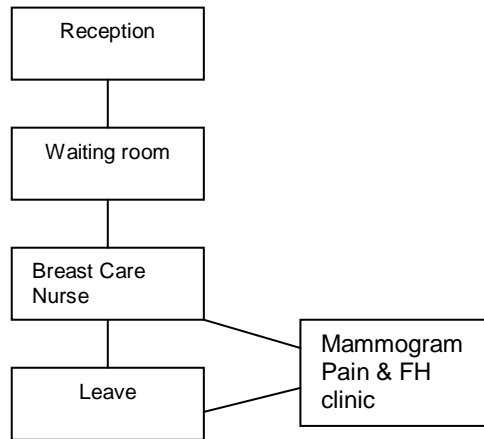


Appendix 2: Work Flow – Breast Screening

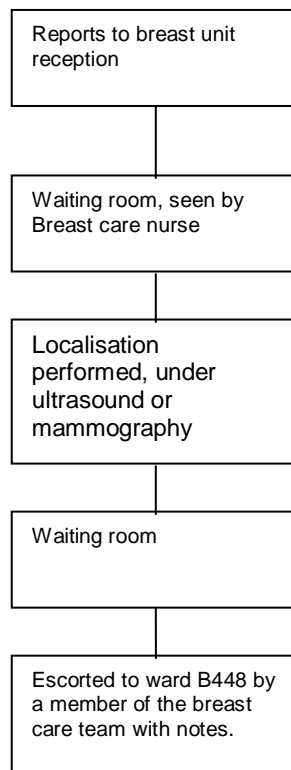
BREAST SCREENING



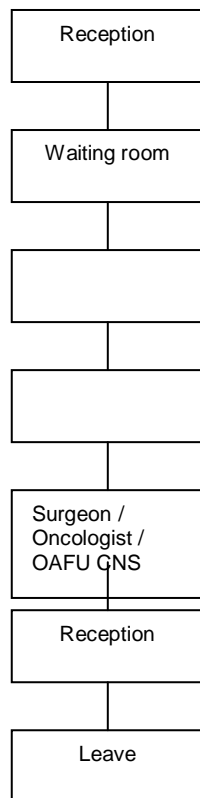
Appendix 3: Work Flow - All Breast Care Nurse Clinics & Prosthesis, Lymphoedema & Breast Pain Clinics



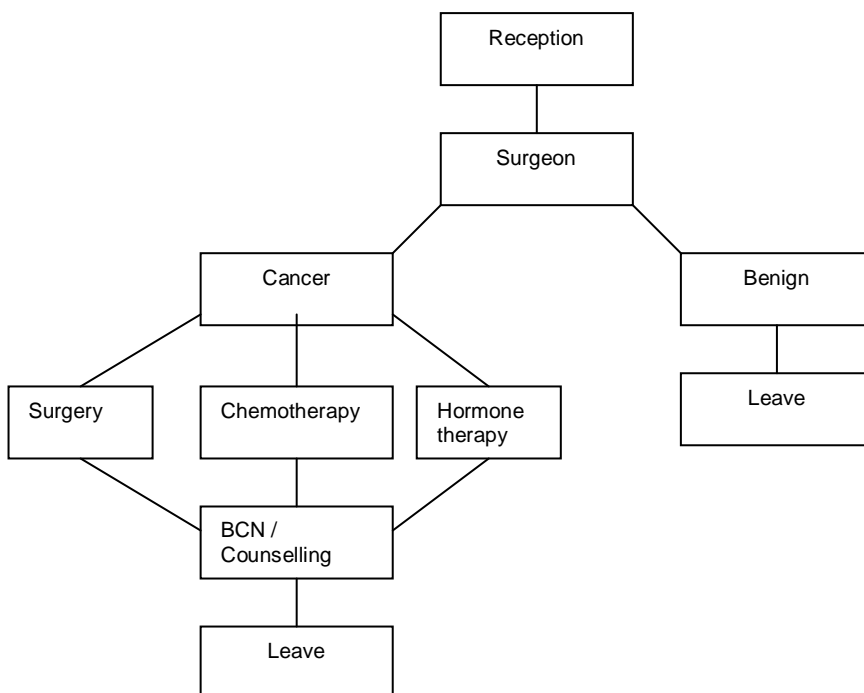
Appendix 4: Work Flow - Localisations



Appendix 5: Work Flow - Follow Up & OAFU Clinics



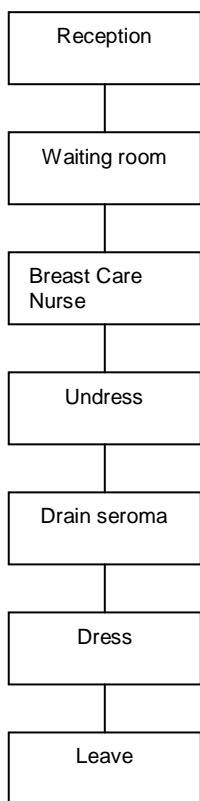
Appendix 6: Work Flow - Results Clinic



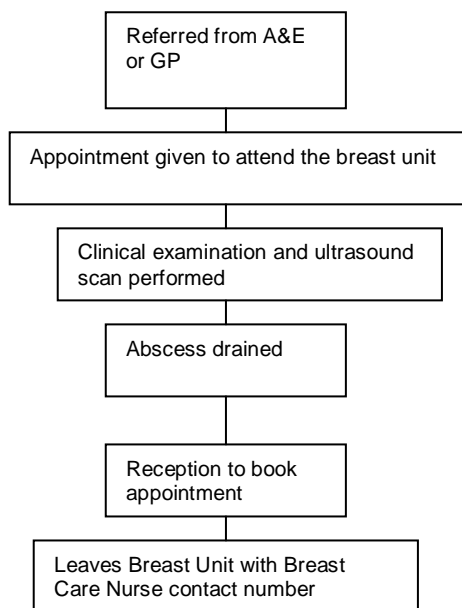
Key

BCN = Breast Care Nurse

Appendix 7: Work Flow - Seroma Clinic



Appendix 8: Emergency Flow - Breast Abscess



Appendix 9: Elective Admissions Pathway

Elective Admissions - Pathway

