

CAMBRIDGE BREAST UNIT

ANNUAL REPORT

October 2009

Author:
Gordon C Wishart
Director of Breast Services
Cambridge Breast Unit

BREAST SCREENING

The following excerpt is taken from the final NHS BSP QA report (April 2009):

1. Introduction and Summary

This is an outstanding Breast Screening Unit, serving a population of around 55,000, that meets or exceeds all significant performance metrics required by the NHS Breast Screening Programme. All major recommendations from the previous QA visit have been addressed.

Uptake is high at just under 78% (KC62 07/08) and the screening round length (SRL) data demonstrate that the percentage of women offered an appointment within 36 months of their previous screen has consistently exceeded the NHSBSP target of >90%; in the last quarter was almost 98%. The proportion of women receiving a normal result within two weeks of attendance is 98% and the service has radically improved performance against the target of >90% within 3 weeks for screen to assessment in the first three quarters of 2008/2009, although they are still not quite meeting the target. However, review of the figures for date of screen to date of first offered appointment for assessment shows performance that exceeds 90%. These results are a reflection of the dedication and hard work of the entire breast screening team.

All disciplines are highly motivated although there remains significant understaffing in the both the radiography and administration & clerical teams. The combined activity with the very busy symptomatic service creates significant pressures on the team and, based upon the screening population, the office should have a further 2.5 whole time equivalent members of staff and the radiography team a further 1.9 wte. It is entirely due to the industry and diligence of the existing staff that they are managing to support this service but the current situation is not sustainable, even in the medium term. The understaffing needs to be addressed within the next three months as it significantly jeopardizes the continued efficient functioning of the service.

The large radiology team function exceptionally well and the cancer detection rates are excellent, particularly the prevalent round rate which is twice the national target. The benign biopsy rates are slightly above target levels which is a reflection the unit's use of vacuum assisted biopsy and the policy for managing B3 lesions. The practices have been the subject of detailed audit.

The surgical team are to be congratulated on providing an excellent surgical service to the breast screening unit and women benefit from high standards of care and excellent outcomes.

The radiology and surgical teams are supported extremely well by the cohesive team of breast care nurses who deliver a high standard of care to screening patients attending for assessment and beyond diagnosis.

Consideration needs to be given to the available space at the breast unit which will not be sufficient with the increased activity that will result from the extended screening age range.

In line with the previous QA recommendations, the pathology team has reduced in number from 8 to 5. They offer an excellent service with only a minor recommendation to label nipple margins for cases of DCIS.


Jem Rashbass

Jo Slater

PEER REVIEW

The CBU experienced the first internal validation as part of the Peer review process.

Overall the unit performed extremely well, complying with 31 of the 35 standards (88.6%) as follows:



Network	AngCN	
Trust	Addenbrookes	
MDT	Addenbrookes	
Date Self Assessment Completed	14th September 2009	
Date of IV Review	16th September 2009	
Lead Clinician	Professor Gordon Wishart	
Compliance		
BREAST MDT	Self Assessment 94.3% (33/35)	Internal Validation 88.6% (31/35)

In particular the unit was praised for:

1. Clinical and research excellence
2. An integrated service and research agenda
3. Excellent 10-year breast cancer survival rate (80.3%) – best in East of England
4. Outstanding Breast Screening QA report (April 2009).
5. High quality nursing support
6. High patient satisfaction (100% satisfied or very satisfied) with clinical service.

There were no immediate risks or serious concerns relating to functioning of the unit. A lack of access to psychological support and advanced communication skills courses were noted to be Trust-wide issues.

This process will be repeated in 2010.

OVERALL BREAST CANCER SURVIVAL

The following survival analyses are based on 2156 patients diagnosed with invasive breast cancer in the Cambridge Breast Unit between September 1998 and December 2007, adjusted for age at diagnosis.

Distribution of cases by prognostic group

NPI group	Number of cases	Percentage
Excellent	227	10.5%
Good	465	21.6%
Moderate 1	561	26.0%
Moderate 2	475	22.0%
Poor	275	12.8%
Very Poor	153	7.1%

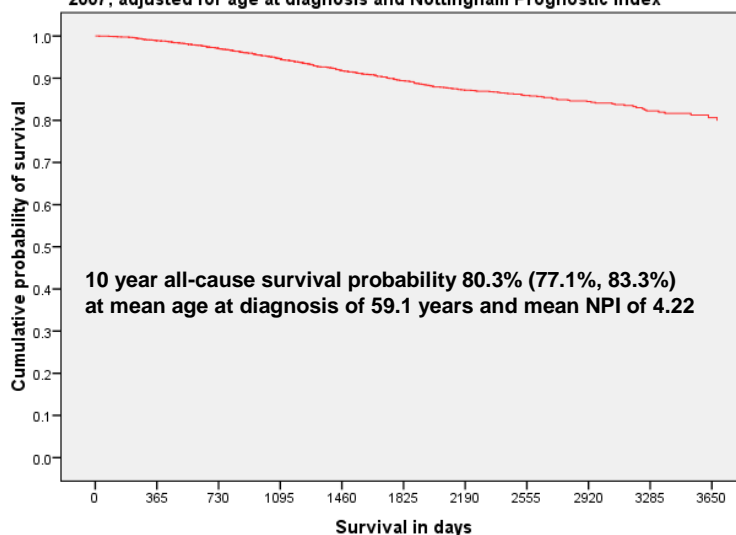
www.ecric.nhs.uk

ecric
Fighting cancer with information

Overall survival analysis (Figures 1&2) was by Cox proportional hazards regression, which gives estimates of relative hazard of dying from breast cancer, and confidence intervals on these.

Figure 1 Overall survival (n=2156): 10 year survival 80.3%

Cox survival function for breast cancer (ICD10:C50, excluding Paget's disease and sarcomas) diagnosed at the Cambridge Breast Unit September 1998 - December 2007, adjusted for age at diagnosis and Nottingham Prognostic Index



www.ecric.nhs.uk

ecric
Fighting cancer with information

Figure 2 Overall survival for each prognostic group according to Nottingham Prognostic Index (NPI).

Cox survival function for breast cancer (ICD10:C50, excluding Paget's disease and sarcomas) diagnosed at the Cambridge Breast Unit September 1998 - December 2007, adjusted for age at diagnosis

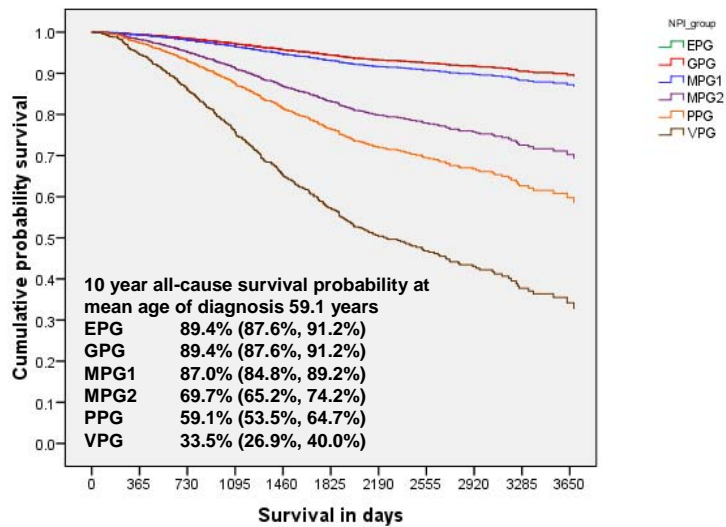
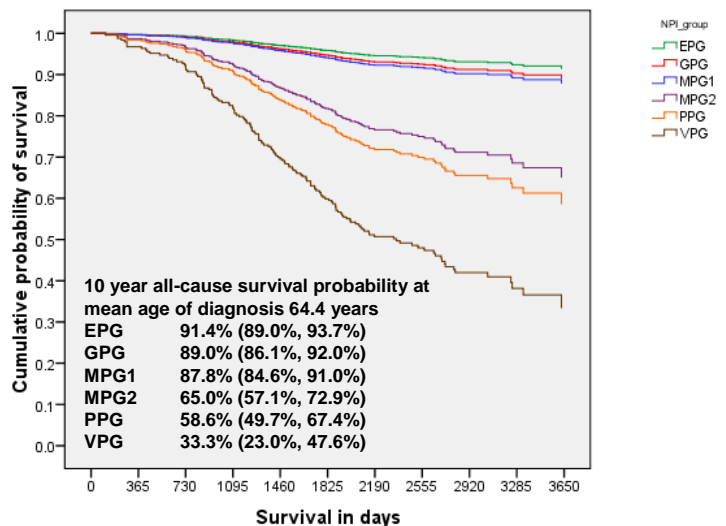


Figure 3 Overall survival for ER positive women over 50 by NPI group

Cox survival function for breast cancer (ICD10:C50, excluding Paget's disease and sarcomas) ER+ cases aged over 50 at diagnosis at the Cambridge Breast Unit September 1998 - December 2007, adjusted for age at diagnosis



BREAST CANCER SURVIVAL IN EAST OF ENGLAND

A recent review of breast cancer survival in ten units in the east of England has recently been published online in the *Annals of Oncology*.

original article

Annals of Oncology
doi:10.1093/annonc/mdp801

Treatment and survival in breast cancer in the Eastern Region of England

G. C. Wishart¹, D. C. Greenberg², P. Chou³, C. H. Brown², S. Duffy³ & A. D. Purushotham^{4*}

¹Cambridge Breast Unit, Addenbrooke's Hospital, Cambridge; ²Eastern Cancer Registration and Information Centre Unit C, Cambridge; ³Cancer Research UK Centre for Epidemiology, Mathematics and Statistics, Wolfson Institute of Preventive Medicine, London and ⁴King's College London and Guy's and St Thomas' National Health Service Foundation Trust, Guy's Hospital, London, UK

Received 5 April 2009; revised 23 April 2009; accepted 28 April 2009

This shows that the Cambridge Breast Unit has the best survival in the east of England. The CBU is hospital 1 in the following table:

Table 2 Results of univariate and multivariate Cox regression analysis for hospital, node status and detection mode in patients aged <70

Factor	Category	Relative hazard and 95% CI	
		Univariate, unadjusted	Multivariate, mutually adjusted
Node status	Negative	1.00 (-)	1.00 (-)
	1-3 positive	2.36 (1.99-2.79)	2.18 (1.84-2.58)
	4+ positive	6.22 (5.37-7.32)	5.55 (4.70-6.56)
	Not examined	2.50 (2.04-3.06)	2.31 (1.88-2.84)
Detection mode	Symptomatic	1.00 (-)	1.00 (-)
	Screening	0.43 (0.36-0.51)	0.56 (0.47-0.66)
Hospital	1	1.00 (-)	1.00 (-)
	2	1.44 (1.01-2.04)	1.12 (0.79-1.61)
	3	1.21 (0.92-1.58)	1.26 (0.96-1.65)
	4	1.26 (1.00-1.58)	1.21 (0.96-1.53)
	5	1.24 (0.93-1.67)	1.15 (0.86-1.54)
	6	1.11 (0.84-1.48)	1.10 (0.83-1.46)
	7	1.36 (1.06-1.76)	1.37 (1.06-1.77)
	8	1.40 (1.06-1.86)	1.38 (1.04-1.82)
	9	1.77 (1.31-2.38)	1.59 (1.18-2.15)
	10	1.29 (0.97-1.70)	1.45 (1.09-1.91)
Significance of hospital differences		<i>P</i> = 0.03	<i>P</i> = 0.07

CI, confidence interval.

In this study overall 5-year survival was good at 78% but worse survival was noted to be associated with failure to document nodal status or ER status in women under 70. Worse survival in the over 70 group was associated with hospitals who used less surgery in the elderly.

LOCAL RECURRENCE RATES (CBU)

1. Local Recurrence following breast conserving surgery for invasive breast cancer.

CBU 5-year LR = 1.13% (abstract 1)

ABS at BASO (2008) guidelines: 5-year LR guideline < 5%; target <3%.

2. Local recurrence following breast conserving surgery for DCIS

CBU 44-month LR = 3.8% (abstract 2)

ABS at BASO (2008) guidelines: 5-year LR guideline <20%; target <10%.

3. Local Recurrence following mastectomy for invasive breast cancer

CBU 5-year LR = 1.4% (abstract 3)

ABS at BASO (2008) guidelines: 5-year LR guideline <5%.

ABSTRACT 1

Local recurrence following breast conservation surgery with 5-mm target margin and 40-Gray breast radiotherapy for invasive breast cancer

S-S Liau, M Cariati, D Noble, C Wilson, GC Wishart

EJC 2008; 6 (suppl): 204.

Background: The risk of ipsilateral breast tumour recurrence (IBTR) following breast conservation surgery (BCS) is dependent on treatment- and tumour-related variables. Treatment-related variables include surgical margin status and postoperative radiotherapy. Tumour-related factors include size of tumour, histological grade and tumour biology. In our unit, we have performed BCS with a target radial margin of 5-mm for invasive breast cancer (IBC) combined with fractionated 40-Gy breast radiotherapy postoperatively since 1999. The aim of the current study is to identify risk factors that are predictive of local recurrence in a cohort of patients who underwent our treatment regime for IBC.

Methods and results: Between 1999 and 2004, 563 patients who underwent BCS for IBC were identified. Women received adjuvant chemotherapy or hormonal therapy as clinically indicated. After a median follow-up of 58 months, 5 of the 563 (0.9%) patients developed IBTR. The 5-year actuarial IBTR rate was 1.1%. In terms of distant disease recurrence (DDR), 29 of the 563 (5.20%) had DDR during follow-up, giving a 5-year actuarial DDR rate of 5.4%. Multivariate analyses identified Nottingham prognostic index (NPI) as the only significant independent prognostic factor for IBTR ($p=0.018$).

Conclusion: The 5-year IBTR rate after BCS with 5-mm target margin and fractionated 40-Gy breast radiotherapy is low at 1.1%. NPI may be useful in stratifying patients who are at greater risk of IBTR.

ABSTRACT 2 (*1st prize, best paper, East Anglia Surgical Club, June 2007*)

Breast-conserving surgery for ductal carcinoma *in situ*: the impact of a 5mm target margin with selective radiotherapy on local recurrence.

Johal S, Liao S-S, Vaqas B, Wilson C, Wishart GC.

Introduction: There is continuing debate about what constitutes an adequate radial margin (RM) following breast-conserving surgery (BCS) for localised ductal carcinoma *in situ* (DCIS). The Cambridge Breast Unit (CBU) has a policy of attempting to achieve a 5mm target RM in all patients treated since 1999, with patients treated by adjuvant radiotherapy (RT) based on the modified Van Nuys Prognostic Index (VNPI). The aim of this study was to determine the local recurrence rate (LR) following BCS +/- RT for localised DCIS.

Method: 261 cases of DCIS were diagnosed and reviewed from January 1999 to December 2004.

Results: 130 patients were treated by BCS +/- RT for DCIS. Mean age was 59 (range 38-86). Mean follow-up was 44 months (range 10-88). DCIS was graded as high (n=76, 58%), intermediate (n=31, 24%) or low cytonuclear grade (n=22, 17%). A minimum 5mm RM was achieved in 107 (80.8%) with 31 patients (23.8%) requiring further excision for close margins. Only 77 (59.2%) patients received adjuvant breast RT. There were 5 (3.8%) LR cases; 1 invasive and 4 DCIS cases. These all occurred in cases of high grade DCIS with 4 cases subsequently treated by mastectomy and 1 case treated by further BCS + RT. Two of the 5 recurrences had RT following initial BCS.

Conclusion: Although the mean follow up is relatively short, the LR rate using a 5mm target RM is low at 3.8%, with an invasive recurrence rate of 0.8%. This recurrence rate has been achieved by selective use of RT in 59.2% of these patients.

ABSTRACT 2

The identification of patients for postmastectomy radiotherapy using the Cambridge Index: Audit of a prospective series

Haba Y, Wishart G C, Wilson C

Breast Cancer Research and Treatment 2007; 106 (suppl 1): S198

Background and aim: Postmastectomy chest wall radiotherapy (PMRT) reduces local recurrence and has been associated with a survival benefit. Its routine use is currently recommended for high risk patients (T3/T4 and/or >4 lymph node positive-LN+). It is not routinely advocated in intermediate (1-3 LN+) or low risk groups (lymph node negative).

In 1999 an index was designed in the Cambridge Breast unit (CBU) to help identify patients in both intermediate and low risk groups who might be at higher risk of local recurrence (LR) and may therefore benefit from PMRT. The index was formulated using known prognostic factors (nodal status, tumour size, grade, lympho-vascular invasion, pectoral muscle involvement) with each given an arbitrary weighting (see below). Patients who scored 3 or more using the index were offered radiotherapy. An audit of this prospective series has been carried out.

SCORE	3	2	1
	Nodes ≥ 4	Nodes 1-3	Lympho-vascular invasion
	Tumour size $>50\text{mm}/\text{T4}$	Tumour size 30-50mm	Tumour size 20-29mm
	pectoral muscle involvement or deep margin $<1\text{mm}$		
			Grade III

Material and methods: Between January 2000 & December 2003 a total of 433 patients were treated by mastectomy at the CBU. 357 invasive tumours (**H** high risk-**H** n=120; **I** intermediate-**I** n=89; **L** low risk-**L** n= 148) were assessed for PMRT according to the index. PMRT was given to 201 (56%) patients in the **H**(112), **I**(70) and **L**(19) groups. The median follow up is 51 months.

Results: The 5 year actuarial LR rates were 9%, 4% and 4% for the **H**, **I** and **L** risk groups respectively with a corresponding 5 yr actuarial overall survival of 49%, 70% and 89%. Only 5 (1.4%) patients have had isolated local recurrences, 4 of whom were in the low risk group, and none received PMRT.

Conclusion: The Cambridge index appears to be a useful tool for the selection of PMRT. 79% of intermediate risk patients received PMRT resulting in a low incidence of local recurrence in this group despite a biologically more aggressive disease. Isolated local recurrences were only seen in non irradiated patients in this series and predominantly in the low risk group.

CBU CLINICAL PAPERS (January 2008 – October 2009)

Allen NE, Beral V, Casabonne D, Kan SW, Reeves GK, Brown A, Green J; Million Women Study Collaborators. Moderate alcohol intake and cancer incidence in women. *J Natl Cancer Inst.* 2009; 101(5): 296-305.

Ashworth PC, Pickwell-MacPherson E, Provenzano E, Pinder SE, Purushotham AD, Pepper M, Wallace VP. Terahertz pulsed spectroscopy of freshly excised human breast cancer. *Opt Express* 2009; 17(15): 1244-54.

Barnett GC, West CM, Dunning AM, Elliott RM, Coles CE, Pharoah PD, Burnet NG. Normal tissue reactions to radiotherapy: towards tailoring treatment dose by genotype. *Nat Rev Cancer* 2009; 9(2): 134-42.

Barnett GC, Wilkinson J, Moody AM, Wilson CB, Sharma R, Klager S, Hoole AC, Twyman N, Burnet NG, Coles CE. A randomised controlled trial of forward-planned radiotherapy (IMRT) for early breast cancer: baseline characteristics and dosimetry results. *Radiother Oncol.* 2009; 92(1): 34-41.

Barter S, Drinkwater K, remedies D. National audit of provision of MRI services 2006/07. *Clin Radiol.* 2009; 64(3): 284-90.

Barrett T, Bowden DJ, Greenberg DC, Brown CH, Wishart GC, Britton PD. Radiological staging in breast cancer: which asymptomatic patients to image and how. *Br J Cancer* 2009; 101: 1522-1528.

Benson JR. Ovarian ablation as a non-surgical treatment for breast cancer. *Lancet Oncol.* 2008; 9(1): 80.

Benson JR, della Rovere GQ. Ipsilateral breast cancer recurrence. *Breast* 2008; 17(1): 12-18.

Benson JR, Liau SS. Cancer genetics: a primer for surgeons. *Surg Clin North Am.* 2008; 88(4): 681-704.

Benson JR, Jatoi I, Keisch M, Esteva FJ, Makris A, Jordan VC. *Lancet* 2009; 373: 1463-79.

Britton PD, Duffy S, Sinnatamby R, Wallis M, Barter S, O'Neill A, Carlos C, Brenton JD, Forouhi P, Wishart GC. One-stop diagnostic breast clinics: how often are breast cancers missed? *Br J Cancer* 2009; 100: 1873-1878.

Britton PD, Goud A, Godward S, Barter S, Freeman A, Gaskarth M, Rajan P, Sinnatamby R, Slattery J, Provenzano E, O'Donovan M, Pinder S, Benson J, Forouhi P, Wishart GC. Use of ultrasound-guided axillary node core biopsy in staging of early breast cancer. *European Radiology* 2009; 19: 561-569

Britton P D, Provenzano E, Barter S, Gaskarth M, Goud A, Moyle P, Sinnatamby R, Wallis M, Benson J R, Forouhi P, Wishart GC. Ultrasound-guided percutaneous axillary lymph node core biopsy: how often is the sentinel lymph node being biopsied? *The Breast* 2009; 18(1): 13-16.

Brodie C, Provenzano E. Vascular proliferations of the breast. *Histopathology* 2008; 52(1): 30-44.

Callagy GM, Webber MJ, Pharoah PD, Caldas C. Meta-analysis confirms BCL2 is an independent prognostic marker in breast cancer. *BMC Cancer* 2008; 8: 153.

Chapman D, Cox E, Britton PD, Wishart GC. Patient led breast cancer follow up. *The Breast* 2009; 18: 100-102.

Coles CE, Cumming J, Benson JR, Forouhi P, Wilkinson JS, Wilson CB, Wishart GC. Titanium clip placement to allow accurate tumour bed localisation following breast conserving surgery– audit on behalf of the IMPORT Trial Management Group. *Eur J Surg Oncol.* 2009; 35(6): 578-582.

Dawson SJ, Duffy SW, Blows FM, Driver KE, Provenzano E, LeQuesne J, Greenberg DC, Pharoah P, Caldas C, Wishart GC. Molecular characteristics of screen-detected vs symptomatic breast cancers and their impact on survival. *Br J Cancer* 2009; 101(8): 1338-44.

Dawson SJ, Provenzano E, Caldas C. Triple negative breast cancers: clinical and prognostic implications. *Eur J Cancer* 2009; 45 (suppl1): 27040.

Della Rover GQ, Nava M, Bonomi R, Catanuto G, Benson JR. Skin-reducing mastectomy with breast reconstruction and sub-pectoral implants. *J Plast Reconstr Surg.* 2008; 61 (11): 303-8.

Duffy SW, Nagtegaal ID, Wallis M, Cafferty FH, Houssami N, Warwick J, Allgood PC, Kearins O, Tappenden N, O'Sullivan E, Lawrence G. Correcting for lead time and length bias in estimating the effect of screen detection on cancer survival. *Am J Epidemiol.* 2008; 168(1): 98-104.

Earl HM, Hiller L, Dunn JA, Bathers S, Harvey P, Stanley A, Grieve RJ, Agrawal RK, Fernando IN, Brunt AM, McAdam K, O'Reilly S, Rea DW, Spooner D, Poole CJ; NEAT investigators. *Br J Cancer* 2008; 99(8): 1226-31.

Garnett S, Wallis M, Morgan G. Do screen-detected lobular and ductal carcinoma present with different mammographic features? *Br J Radiol.* 2009; 82: 20-7.

Gilbert FJ, Astley SM, Gillan MG, Agbaje OF, Wallis MG, James J, Boggis CR, Duffy SW; CADET II Group. Single reading with computer-aided detection for screening mammography. *New Engl J Med.* 2008; 359(16): 1675-84.

Gilbert FJ, Warren RM, Kwan-Lim G, Thompson DJ, Eeles RA, Evans DG, Leach MO; United Kingdom Magnetic Resonance Imaging in Breast Screening (MARIBS) Study Group. Cancers in BRCA1 and BRCA2 carriers and in women at high risk of breast cancer: MR imaging and mammographic features. *Radiology* 2009; 101(9): 358-68.

Groves AM, Wishart GC, Shastry M, Moyle P, Iddles S, Britton PD, Gaskarth M, Warren RML, Ell PJ, Miles KA. Metabolic-Flow Relationships in Primary Breast Cancer: Feasibility with Combined PET/ Dynamic Contrast Enhanced CT. *Eur J Nucl Med & Mol Imaging* 2009; 36(3): 416-421.

Harris EJ, Donovan EM, Yarnold JR, Coles CE, Evans PM; IMPORT Trial Management Group. Characterisation of target volume changes during breast radiotherapy using implanted fiducial markers and portal imaging. *Int J Radiat Oncol Biol Phys.* 2009; 73(3):

Heywang-Köbrunner SH, Sinnatamby R, Lebeau A, Lebrecht A, Britton PD, Schreer I; Consensus Group. Interdisciplinary consensus on the use and technique of MR-guided vacuum-assisted breast biopsy (VAB): results of a European consensus meeting. *Eur J Radiology* 2008; (epub)

Hughes-Davies L, Caldas C, Wishart GC. Tamoxifen: the drug that came in from the cold. *Br J Cancer* 2009; 101: 875-878.

Lawrence G, Wallis M, Allgood P, Nagtegaal ID, Warwick J, Cafferty FH, Houssami N, Kearins O, Tappenden N, O'Sullivan E, Duffy SW. Population estimates of survival in women with screen-detected and symptomatic breast cancer taking into account of lead time and length bias. *Breast Cancer Res Treat.* 2009; 116(1): 179-85.

Moyle P, Sonoda L, Mbbchir, Britton P, Sinnatamby R, Mbbchir. Incidental breast lesions detected on CT: what is their significance? *Br J Radiol.* 2009; (epub).

Naderi A, Hughes-Davies L. A functionally significant cross-talk between androgen receptor and ErbB2 pathways in oestrogen receptor negative breast cancer. *Neoplasia* 2008; 10(6): 542-8.

Naderi A, Hughes-Davies L. nerve growth factor/nuclear factor-kappaB pathway as a therapeutic target in breast cancer. *J Cancer Res Clin Oncol.* 2009; 135(2): 211-6.

Pal A, Provenzano E, Duffy SW, Pinder SE, Purushotham AD. A model for predicting non-sentinel lymph node metastatic disease when the sentinel node is positive. *Br J Surg* 2008; 95(3): 301-9.

Provenzano E, Pinder SE. Pre-operative diagnosis of breast cancer in screening: problems and pitfalls. *Pathology* 2009; 41(1): 3-17.

Reeves GK, Pirie K, Green J, Bull D, Beral V; Million Women Study Collaborators. Reproductive factors and specific histological types of breast cancer: prospective study and meta-analysis. *Br J Cancer* 2009; 100(3): 538-44.

Stuart-Harris R, Caldas C, Pinder SE, Pharoah P. Proliferation markers and survival in early breast cancer: a systematic review and meta-analysis of 85 studies in 32,825 patients. *Breast* 2008; 17(4): 323-34.

Udler MS, Azzato EM, Healey CS, Ahmed S, Pooley KA, Greenberg D, Shah M, Teschendorff AE, Caldas C, Dunning AM, Ostrander EA, Caporaso NE, Easton D, Pharoah PD. Common germline polymorphisms in COMT, CYP19A1, ESR1, PGR, SULT1E1, and STS and survival after a diagnosis of breast cancer. *Int J Cancer* 2009; 125(11): 2687-96.

Wardley AM, Hiller L, Howard HC, Dunn JA, Bowman A, Coleman RE, Fernando IN, Ritchie DM, Earl HM, Poole CJ; tAnGo trial collaborators. tAnGo: a randomised phase III trial of gemcitabine in paclitaxel-containing, epirubicin/cyclophosphamide-based, adjuvant chemotherapy for early breast cancer: a prospective pulmonary, cardiac and hepatic function evaluation. *Br J Cancer* 2008; 99(4): 597-603.

Wallis MG, Lawrence G, Brenner RJ. Improving quality outcomes in a single-payer system: lessons learned from the UK national Health Service Breast Screening Programme. *J Am Coll Radiol.* 2008; 5(6): 737-43.

Wallis MG, Cheung S, Kearins O, Lawrence GM. Non-operative diagnosis-effect on repeat-operation rates in the UK breast screening programme. *Eur Radiol.* 2009; 19(2): 318-23.

Whitfield GA, Horan G, Irwin MS, Malata CM, Wilson CB, Wishart GC. Comparison of the incidence of severe capsular contracture following implant-based immediate reconstruction with or without postoperative chest wall radiotherapy using 40Gy in 15 fractions. *Radiotherapy & Oncology* 2009; 90(1): 141-147.

Wishart GC, Greenberg DC, Britton PD, Chou P, Brown CH, Purushotham AD, Duffy SW. Screen-detected versus symptomatic breast cancer-is improved survival due to stage migration alone? *Br J Cancer* 2008; 98: 1741-1744.

Wishart GC, Greenberg DC, Chou P, Duffy S, Brown CH, Purushotham AD. Treatment and survival in breast cancer in the Eastern Region of England. *Annals of Oncology* (published online 7.6.09)

Zhang H, Rakha EA, Ball GR, Spiteri I, Aleskandarany M, Paish EC, Powe DG, Macmillan RD, Caldas C, Ellis IO, Green AR. The proteins FABP7 and OATP2 are associated with the basal phenotype and patient outcome in human breast cancer. *Breast Cancer Res Treat.* 2009; (epub)