are similar to those for women over age 50 in the UK National Breast Screening Program.

417 ORAL

Is annual mammography better to detect a contralateral breast cancer than mammography at a greater interval?

R. Kaas, A.A.M. Hart, E.J.Th. Rutgers, J.L. Peterse, A.P.E. Besnard. *Netherlands Cancer Institute/Antoni van Leeuwenhoek Ziekenhuis Amsterdam, The Netherlands*

Background: Follow up with annual mammography (MG) and regular clinical breast examination (CBE) is generally advised for women after curative treatment for primary breast cancer in order to detect a contralateral breast cancer (CBC) in an early stage.

Purpose: To investigate whether annual mammography results in the detection of contralateral breast cancers in an earlier stage compared to less frequent MG.

Patients and Methods: We compared stage and outcome of women with CBC diagnosed while on an annual MG and CBE schedule to women with the same CBE, but a less frequent MG screening interval. We studied 269 patients with a CBC treated for the first breast cancer in the period 1976–1987. They were followed until 1998.

Results: Group A consisted of 120 patients with CBC who had a MG interval of at the most 15 months. In group B 149 patients were analysed, their MG was made at a greater interval.

Group	N	Mean MG/pat	Mean MG interval months	Mean age at first BC	Found by %	Clinical occult %	Stage 0+I CBC %	node negative %	Dead by % 1998
A	120	6.25	12.2	49.5 yr	37	32	51	69	43
B	149	4.35	21.0	54.2 yr	40	25	59	68	42

MG was more often the source of first suspicion in recent years and tumor stages improved, but compared to the ipsilateral tumor stages hardly any difference was seen.

Survival curves will be presented.

Conclusion: Intensive follow up with annual MG does not lead to more non-palpable CBC's, nor better tumor stages than follow up with a less frequent radiological follow up.

418 POSTER

Continuing education and results in breast cancer screening

H. Rijken, J. Hendriks, R. Holland. *University Hospital Nijmegen, National Expert and Training Centre for Breast Cancer Screening, P.O. Box 9101, 6500 HB Nijmegen, The Netherlands*

At the end of 1997 the implementation of the nationwide mammographic screening has been completed in the Netherlands, resulting in 625.000 tests per year involving the age cohort 50–69 and with a screening interval of two years. All radiologists, radiographers and pathologists participating in the screening programme are trained in the National Expert and Training Centre in Nijmegen, the Netherlands, before the commencement of the screening. Technical quality control of all the 50 screening units is an additional task of the Centre.

The training programme for the radiologists includes the topics of screening vs clinical diagnosis, pattern recognition, the threshold for recall and radiologic/pathologic correlation, for the pathologists, handling of the specimen, differential diagnostic problems and similarly the radiologic/pathologic correlation. The radiographers are trained in positioning techniques, pattern recognition, psycho-social aspects and technical quality assurance.

The Centre has the task to evaluate the medical performance of the various disciplines by means of site visits. At these visits, first, the overall screening results of the first and subsequent rounds are evaluated, second, mammograms of a one-day production are reviewed for positioning- and technical quality and third, screening and diagnostic mammograms of interval and screen-detected St. II cancers are reviewed.

Results of 15 site visits will be presented and reasons for the regional variations will be discussed.

We conclude that training should be done before the commencement of the screening, that a continuous follow-up of the results is mandatory and that the various disciplines should be retrained continuously, both centrally and at the site by self-education.

419 POSTER

Screening – Yes, but whom and when?

S. von Kleist. *Europa Donna; Institute of Immunobiology, University of Freiburg, Med. Fac., Stefan-Meier-Str. 8, D-79104 Freiburg, Germany*

Screening is a way of detecting breast cancer in an asymptomatic, hence in many cases early stage. Early diagnosis – so women were taught – means a better chance for – if not curative – so at least improved treatment. So why is there lately so much argument about screening? Mostly because there is actually no scientific evidence proving (or disproving) the benefit of an early detection. The optimal age for starting screening, age-related anatomical difficulties, the interval, the techniques (mammography, BSE, CBE), the costs, no proof of a decrease in cause-specific mortality and the too often lacking experience of the mammographers, are only a few of the unsettled issues, that render the women insecure. In addition genetic markers have to be added by which women with a high risk to develop breast or ovarian cancer can be identified.

But since these open questions perhaps can never be answered univocally, women should be educated to inform themselves and take advice from their physician of confidence about the advantages and limits of screening and then take their health program in their own hands.

420 POSTER

Can population based screening reduce the mortality from breast cancer?

D.B. Kingsmore[1], D. Hole[2], C.R. Gillis[2], W.D. George[1]. [1]*Department of Surgery, Western Infirmary;* [2]*West of Scotland Cancer Surveillance Unit, Glasgow, UK*

Aim: We analyse the impact of the NHS breast screening program on disease stage, estimate the impact on mortality.

Methods: The pathology reports were obtained for all invasive breast cancers from 1988 to 1996 in women aged 50–64 in a defined geographical area. The distribution of tumour size was compared pre-screening and the second round. Mortality pre-screening was compared to that predicted for the second round.

Results: Tumour size changed significantly (Table 1). Mortality is predicted to drop by 22% from an observed 39% to 30.5% ($p < 0.0000$).

Table 1. The Distribution Of Tumour By Screening Round And Observed And Predicted Mortality

Tumour size mm	Observed 7 year mortality	Observed dist. Prescreening	Contribution to overall mortality	Observed dist. round 2	Predicted mortality round 2
<10	13%	0.03	0.4%	0.2	2.6%
10–19	18%	0.2	3.6%	0.31	5.6%
20–39	42%	0.36	15.1%	0.26	10.9%
40+	56%	0.15	8.4%	0.07	3.9%
unknown	47%	0.25	11.8%	0.16	7.5%
Total		1.00	39.3%	1.00	30.5%

Dist. = Distribution of tumour size

Conclusions: The change of tumour size seen due to the NHS Breast Screening Program implies that population based screening is effective.

421 POSTER

Symptomatic status, mammographic sensitivity and screening policy

A. Kavanagh, H. Mitchell, G. Giles. *Anti-Cancer Council of Victoria, Cancer Epidemiology Centre, 1 Rathdowne Street, Carlton, Victoria 3053, Australia*

Population-based mammographic screening was introduced in Victoria, Australia in the 1990s and was fully operational by 1994. Screening is biennial with two-view mammography and double reading. The program is specifically targeted to women aged between 50 and 74 years, however women 40 to 49 years of age and women older than 75 can attend. Although the program is designed for asymptomatic women some women with symptoms do participate. According to BreastScreen Victoria policy women with a breast lump for less than 12 months who have not seen a doctor for the lump and women who report a blood-stained or watery nipple discharge should be referred for clinical assessment irrespective of the outcome of their screening mammogram. Women with 'other symptoms' are managed the same way as asymptomatic women.

We calculated the sensitivity of screening mammography according to the symptomatic status of women presenting for first round screening in 1994.

Women with a personal history of breast cancer and women who were not resident in the state of Victoria at the time of screening were excluded. Women who report a breast lump and/or a blood-stained or watery nipple discharge are defined as having 'breast symptoms' and women who report any other symptom, such as breast tenderness or pain, are classified as having 'other symptoms'.

The sensitivity for asymptomatic women, women with 'other symptoms' and women with 'breast symptoms' were 75.6% (95% CI 72%–79%), 60.0% (95% CI 48%–72%) and 80.8% (95% CI 72%–90%) respectively. After controlling for age, women with 'other symptoms' were more likely to have a false negative screen (Odds Ratio 1.89, 95% CI 1.1–3.3) compared with asymptomatic women while women with 'breast symptoms' were half as likely to have a false negative screen (Odds Ratio 0.52, 95% CI 0.28–0.99) compared with asymptomatic women.

One possible explanation for the low sensitivity in the 'other symptoms' category is that some of the symptoms, such as breast pain and tenderness, may be due to the presence of glandular tissue in the breast and breasts with a high proportion of glandular tissue appear radiodense on mammography.

422 POSTER

Pre-operative diagnosis of screen detected cancers: Increasing the diagnostic rate

H.A. Bradpiece, U.P. Khot, A.R. Patel, M.W.E. Morgan. *Breast Unit, St. Margaret's Hospital, Epping, UK*

The recommended standard for the pre-operative diagnosis of screen detected cancers by the NHSBP is 70%. Our unit over the period 1 April 1996–31 March 1997 achieved a pre-operative diagnosis rate of 64.1%. (44.8% by fine needle aspiration cytology alone and 19.3% by 14G core biopsy).

Over the period 1 April 1997–27 March 1998 the pre-operative diagnosis rate is 75%. Fine needle aspiration cytology alone was the method in 67.5% and core biopsy in 7.5%.

The mammographic and pathological features of all these cancers presented.

It is recommended that fine needle aspiration cytology should be the prime modality for pre-operative diagnosis of screen detected abnormalities with core biopsy being recommended in selected cases.

423 POSTER

A model of elderly Latina's breast screening decisions

C. Veit, T. Clairice. *RAND, Behavioral Sciences, 1700 Main Street, Santa Monica 90401, USA*

Purpose: The present study was designed to develop a causal algebraic barrier model of poor elderly Latina, s breast screening decisions to increase our understanding of these decisions and inform breast screening policy.

Methods: The study combined traditional survey techniques with a controlled judgment experiment to test among alternative models. Fifty-two women judged the chance of having yearly mammograms in 79 situations that varied in cost, perceived risk, and source of the recommendation (none, a cancer institution, a doctor); they also completed a background-opinion questionnaire.

Results: All 3 factors significantly affected judged screening decisions; interactions ruled out the class of additive models (e.g., expected utility). An averaging model that weights the difference between women's highest- and lowest-valued feature of a screening situation predicted situations that could increase utilization by non-compliers and decrease utilization by compliers. With a recommendation (73% of compliers, 5% of non-compliers), non-compliers will comply if mammograms are free, even with a low perceived risk (77% of women); with a high perceived risk, non-compliers will likely pay up to $50 and compliers to $100. A recommendation from a cancer organization is as influential as from a doctor for non-compliers, in contrast to compliers. Without a recommendation, however, non-compliers will not comply.

Conclusion: Low costs and more effective information dissemination about risk and recommended screening frequencies should retain compliers and motivate non-compliers to comply.

424 POSTER

Effectiveness of mammographic screening for breast cancer in women aged over 50 years in Japan

T. Morimoto[1], M. Sasa[2], T. Yamaguchi[3], H. Kondo[3], Y. Sagara[3]. *[1]School of Medical Sciences, The University of Tokushima; [2]Tokushima Breast Care Clinic; [3]Tokushima Health Screening Center, Japan*

Purpose: The optimal age for effective screening of subjects for breast cancer by mammography was studied based on the results of two mammographic screening systems in Japan.

Method: Two screening systems were investigated in this study. System I consisted of visit screening using a bus equipped with a mammographic apparatus. System II consisted of central screening performed at Tokushima Health Screening Center.

Results: The examinees numbered 4,156 and 5,704 in system I and II, respectively. The detection rates of breast cancer were 0.55% and 0.26% in system I and II, respectively, which are 2–5 times higher than that (0.12%) obtained by conventional screening using physical examination alone. The proportion of stage I was 69.6% in system I and 73.3% in system II. The rates of no nodal involvement were high, being 78.8% and 75% in system I and II, respectively. Breast conserving therapy was applied to 26 of the 38 patients with breast cancer detected by the two screening systems. In Wolfe's classification of mammograms, the proportion of DY pattern was remarkably low, being 3.2% in the sixth decade and 0.8% in the seventh decade, compared with 16.6% in women aged 49 years.

Conclusion: These results indicate that mammographic screening is effective in women aged over 50 years in Japan, as well as in other countries.

425 POSTER

Factors influencing women's decisions to undergo genetic testing for breast cancer

M. Cappelli[1], L.D. Surh[1], S. Verma Logan[2], A. Hunter[1], L. Humphreys[1], J. Allanson[1]. *[1]Children's Hospital of Eastern Ontario; [2]Ottawa Regional Cancer Centre, General Division, Canada*

Purpose: This study examined the attitudes and preferences for BRCA1 testing among Canadian women with and without breast cancer. Factors predicting intentions to be tested were also assessed.

Methods: A face-to-face assessment was conducted with 102 women: 1) 52 women diagnosed with breast cancer under the age of 50 and 2) 50 unaffected women from the general population under the age of 50. Family history of breast and other cancers, demographic characteristics (including age, education, religion, number of children and family income), and knowledge and attitudes about breast cancer and genetic testing were assessed. Intended and actual uptake of BRCA1 testing was also determined.

Results: Overall, 59% of participants indicated a preference to undertake the test, and 41% either did not want it or were uncertain. While 71% of breast cancer patients wanted to be tested, only 52% had actually contacted a genetic counsellor about BRCA1 testing at follow-up 1–12 months later. In logistic regression analysis, independent predictors of "intent to be tested" were a diagnosis of breast cancer and fewer perceived costs of testing (including excessive worry, thinking it better not to know, and seeing testing as too much trouble).

Conclusion: There is a moderate level of demand for BRCA1 testing among women both with and without breast cancer, increasing significantly among breast cancer patients alone. Those who choose to be tested may perceive relatively few costs of utilizing this technological service. Other factors, such as socioeconomic and educational status, family history of breast cancer, and knowledge about breast cancer and gene testing were not associated with preference to be tested. This holds implications for genetic counsellors in terms of providing balanced and complete information to women considering genetic testing for breast cancer susceptibility.

426 POSTER

Improvements in survival from the NHS mammographic screening programme – A single centre study

H. Chan, L.A. Harris, B. Shepstone, R. English, M.J. Greenall. *University of Oxford/John Radcliffe Hosp., Dept. of Surgery, Headley Way, Oxford OX3 9DS, UK*

Introduction: There have been concerns about the value of the National Health Breast Screening Programme (NHBSP), as little outcome data