detoxificate quinones and protect cells against neoplasia. NQO2, whose sequence is homology with NQO1, has a complicated and paradoxical function and remains a source of many questions. The real function of NQO2 on estrogen metabolites and its attribution to breast cancer susceptibility have not been evaluated yet.

Materials and Methods: In a hospital population-based case-control study of breast cancer, 888 cases and 695 age and menopausal status-matched controls were genotyped for the polymorphic NQO2. Six common single nucleotide polymorphisms (SNP) spanning this gene and one 29 base-pair insertion/deletion polymorphism (29bp-I/D) in promoter region, were chosen as tag-SNPs via Hapmap and dbSNP database and were genotyped. We investigated the association between variants in NQO2 and breast cancer susceptibility.

Results: A 29bp deletion polymorphism in the presumed NQO2 promoter region was associated with decreased breast cancer risk [odds ratio (OR) = 0.73, 95% confidence interval (95% CI): 0.61−0.88, P = 0.0007; permutated P = 0.007). Other two SNPs (rs2071002 and rs2070999) showed significant association with breast cancer susceptibility (P = 0.0051 and 0.0152; permutated P = 0.034 and 0.096 respectively). After being adjusted by epidemiological and clinical factors such as age, age at menarche, menopausal status, BMI and parity, DD genotype of 29bp-I/D had a OR of 0.47 (95% CI: 0.26−0.85); GG genotype of rs2071002 had a OR of 0.66 (95% CI: 0.45−0.97), both displaying protective effects against breast cancer. Another common haplotype in the block consisting of 3 SNPs was significantly associated with breast cancer (P = 0.03).

Conclusions: The observed multiple breast cancer-associated genetic variants suggested that the NQO2 gene plays an important role in breast carcinogenesis. Further analysis of the molecular mechanism is needed to be conducted.

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Prospective registration in the Leiden region facilitates exchange of good clinical practice between multidisciplinary mamma teams

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Background: Quality of general health care and specifically breast cancer care is a hot topic nowadays. It is questionable whether all in hospital quality measurements are sufficiently reliable, representative and reproducible. Therefore, we started a prospective breast cancer and DCIS data registration study concerning diagnosis and treatment.

Methods: In 2005, all 9 hospitals in the CCCW region committed themselves into this project. Registration started in 01−01–2006. During 2007, data were collected for all patients diagnosed with either breast cancer or DCIS in 2006. Registration was carried out by co-workers of the National Cancer Registry. Data were derived directly from the hospital patient files, including the pathology reports, nine months after the incidence date. Results are given as means for each hospital and are compared with the mean results of the 9 hospitals together.

Results: In 2006, 1,363 breast cancer patients were included, 1,237 patients underwent surgery. Breast conserving therapy varied between 47−61% in the 9 hospitals. In 68−98% axillary nodes were identified after sentinel node procedure. Radiotherapy as part of breast conserving therapy occurred in 92–100%. Tumour free resection margins of the first lumpectomy varied between 61−85% in the 9 hospitals. In patients under 70 years with more than 4 positive axillary nodes, locoregional radiotherapy after modified radical mastectomy was given in 67–100%. Of the patients with tumors larger than 3 cm or axillary node metastases, and younger than 50 years, 85–100% received adjuvant chemotherapy, whereas 75–100% of the patients younger than 70 years with negative ER, PR receptors received adjuvant chemotherapy. Radiotherapy was started within 4 weeks after surgery in 0−28% and adjuvant chemotherapy in 9−60%. Patients (<50 years) with endocrine sensitive tumours (>3 cm or with axillary node metastases) 63–100% received adjuvant hormonal therapy. When overexpression of HER 2 was present adjuvant trastuzumab treatment (if indicated) was given in 50–100%.

Conclusion: Our prospective registration project appeared feasible, differences between hospitals were noted and indicate the usefulness of monitoring daily clinical practice in our region. Based on these objective data, improvements in breast cancer care can be initiated.

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Positive bone marrow biopsy is associated with a decreased event-free survival in patients with breast cancer

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Background: Bone marrow (BM) biopsy has been suggested as an independent prognostic tool to improve staging in patients with breast cancer.

Materials and Methods: 246 consecutive patients operated for breast cancer from June 2000 to June 2007 who signed an informed consent were enrolled in this protocol. Data were collected prospectively in to a computerized database. Patients underwent SLN biopsy, and lymph nodes were analysed with serial sections and stained with hematossilin-eosin and immunohistochemestry. At the end of procedure a BM aspirate from the iliac crest was obtained and 5−10 cc of blood collected, and since 2002 a peripheral blood (PB)sample was also obtained. Both CEA and Mammoglobin specific nested reverse transcriptase (RT) polymerase chain reaction (PCR) assays were used to examine BM and PB samples.Results were blinded to patients and clinicians.

Results: The median age was 56 years (range 34−80), and the median tumor diameter was 1.5 cm (range 0.2−4.5). BM aspirates were unsuccessfull in nine patients, and RT-PCR was not technically feasible in additional 15 women, leaving 222 patients available for analysis of results and follow-up.104/222 patients (47%) had either a BM or a PB test positive. Concordance between BM and PB, and between CEA and Mammoglobin samples was 84% and 79% respectively. Discordance between nodal and BM status (N−/M+ or N+/M−) was verified in 87/222 cases (39%). Nodal status was correlated with a positive test (37% vs 58%, p = 0.001), while tumor diameter, grade and hormonal status were not. At a median follow-up of 50 months event-free survival was significantly lower in the BM+ group (84% vs 96%, p = 0.004).Event-free survival for N−/M− patients was 96%, for N+/M+ patients was 75%, while patients with only one status positive (N−/M− or N+/M−) had an intermediate survival (88%) (p = 0.001).

Conclusions: This study confirms that BM biopsy has an impact on event-free survival of patients with operable breast cancer. This may identify a substantial subgroup of patients N−/BM+ with a decreased survival who may need a more aggressive approach.

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Economic evaluation of zoledronic acid for the prevention of osteoporotic fractures in post-menopausal women with early-stage breast cancer receiving aromatase inhibitors in the United Kingdom

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Background: Aromatase inhibitors (AIs) are used as adjuvant therapy in early-stage breast cancer (BCa). AIs are associated with accelerated bone loss in a population already at higher risk for osteoporosis and fractures. The Z-FAST trial demonstrated that zoledronic acid (ZOL) prevents AI-associated bone loss (AIBL) in postmenopausal women (PMW) with BCa. Information on the economic consequences of using ZOL in this context is limited. The present analysis assessed, from the UK's National Health Service perspective, the cost-effectiveness of ZOL in the prevention of fractures in PMW with AI treated BCa.

Methods: A Markov model was developed to project the lifetime incidence of osteoporotic fractures as a function of bone mineral density (BMD) for women with early-stage breast cancer (aged 60 years old at therapy initiation). In the model, patients were assumed to receive AIs for 5 years with ZOL (4 mg IV infusion q 6 months), either administered upfront to all patients (upfront arm) or as salvage therapy only in patients with AIBL (delayed arm). The model also simulated separately the outcomes of patients receiving no ZOL therapy. Subsequently the model simulated the impact of fractures on costs, quality of life and mortality. Uncertainty was addressed via multivariate probabilistic sensitivity analyses (PSA), which involved 1,000 model simulations using input values drawn from probability distributions. All future costs and effects were discounted at 3.5% per annum.

Results: Upfront ZOL treatment resulted in a gain of 0.052 QALY (95% CI: 0.027−0.077) v. delayed ZOL treatment. Upfront therapy resulted in an incremental cost of £25,515 per QALY gained. In the PSA, the cost per QALY was less than £38,730 in 95% of the 1,000 model replicates. When compared to no treatment, upfront ZOL therapy was associated with a gain of 0.080 QALY (95% CI: 0.041−0.118), with an incremental cost of £21,821 per QALY gained. In this case, the cost per QALY was less than

£33,381 in 95% of the PSA replicates. The cost effectiveness was improved in patients 70 years and older at entry and in patients with low BMD.

Conclusions: This analysis suggests that treatment with ZOL is cost-effective for the prevention of bone-loss and fractures in PMW with early BCa receiving AI therapy in the UK.

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Nationwide Korean breast cancer data of 2006 using breast cancer registration program

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Background: Since 1996, Korean Breast Cancer Society has analyzed and reported the nationwide breast cancer data biennially. The purpose of the present study was to evaluate the chronological changes and characteristics of Korean breast cancer. From 2001, on-line Korean Breast Cancer Registration Program was started and we can now obtain and analyze the data more easily.

Materials and Methods: Data were collected from 39 medical schools (69 hospitals), 23 general hospitals and 5 private clinics. Essential data (patient number, age, sex) were collected via questionnaire and other detailed data were collected through the on-line Korean Breast Cancer Registration Program.

Results: In 2006, 11,275 cases of breast cancer were newly diagnosed. The crude incidence rate of breast cancer of 2006 was 46.8 among 100,000 women and median age was 48.0 years. The age distribution of breast cancer peaked in the fifth decade (40.0%); followed by the sixth (25.7%), fourth (14.3%) and seventh (13.0%) decades. The proportion of early breast cancer (stage 0, I) was 47.5% and breast conserving surgery was performed in 48.8% of the patients. Compared with the results of previous survay, characteristics of Korean breast cancer in 2006 were (1) an increase in the number of patients and the incidence rate, (2) high proportion of young age premenopausal patients, (3) increase in the proportion of breast conserving surgery, (4) increase in the rate of early cancer (stage 0, I), (5) increase in the rate of patients whose breast cancer was detected on screening, (6) increase in patients with some risk factors.

Conclusions: Present study suggest the incidence of Korean breast cancer will continue to rise. Several characteristics of Korean breast cancer patients seem to follow the patterns of western countries, but differences are also present. We, all the members of Korean Breast Cancer Society, believe that it was very important and meaningful to understand the characteristics of Korean breast cancer through continuous nationwide data collection and analysis as the present study in the future.

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Physical activity and the risk of breast cancer in BRCA1/2 families in the Netherlands

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It has been consistently shown that physical activity reduces the risk of breast cancer in the general population by approximately 20–40%. However, it remains unclear whether and how physical activity affects breast cancer risk in BRCA1/2 breast cancer families. Since physical activity is a modifiable risk factor, it is important to obtain insight in its possible influence on the risk of breast cancer in this high-risk population.

In this retrospective nationwide cohort study, a self-administered questionnaire on known and suspected breast cancer risk factors was completed in by 3715 eligible female family members in 485 BRCA1/2 families between 1998 and 2007. In order to reduce potential survival bias, information on deceased persons was collected through a close relative. 918 women were typed as BRCA1/2 mutation carrier and 142 were identified as obligate carrier. Information on breast and ovarian cancer and on preventive surgical measures was verified with the PALGA database (Pathological Anatomy National Automated Archive) until August 2007.

Information on physical activity will be derived from questions on walking, cycling, household activities, longest held occupation and sport activity (before and after age 20). Duration (average amount of hours spent weekly) and intensity (ratio of work metabolic rate to resting metabolic rate (METs)) will be considered separately and combined. We will also analyse a total physical activity score in which the different categories of physical activity will be combined. The multivariate hazard ratio as estimate of relative risk and 95% confidence intervals will be obtained using the Cox Proportional Hazards Model stratified for gene and birth cohort with subjects' censoring-age as time scale. Possible effect modification by family history of breast cancer and BMI will be investigated. Results will be presented.

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Triple negative breast cancers – clinicopathological differences in an Asian population

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Background: Triple negative breast cancers (TNBC) account for 15% of breast cancers and more frequently affect premenopausal African and Afro-American women. There is a paucity of data from Asian countries. We aim to review our data to compare clinicopathological characteristics in our local population.

Methods: 326 consecutive patients treated for breast cancer from May 2006 to December 2007 were analyzed. Data on clinical and histopatho-logic characteristics were retrieved from a prospectively collected database. TNBC patients were defined by negativity of estrogen, progesterone and HER2neu receptors. Chi square analysis was used to evaluate independent prognostic factors.

Results: In the study cohort, the median age was 56 years (range 27–90). 284 (88%) were invasive ductal carcinoma, 18 (6%) were invasive lobular carcinoma, 14 (4%) were mucinous and 8 (3%) were others (cribiform, tubular etc). 236 (73%) were estrogen receptor positive, 144 (45%) were progesterone receptor positive and 52 (16%) were Her2neu positive.

The incidence of TNBC is 13%. The majority were between the age groups 51 to 60 years (35%) >60 years old (37%). 69.8% (n = 30) were Chinese and 30% (n = 13) of the patients were premenopausal. Tumour size was $\leqslant$1 cm in 3% (n = 1), 1.1–2 cm in 33% (n = 13), 2–5 cm in 49% (n = 19) and >5 cm in 15% (n = 6). Lymphovascular invasion was seen in 10 (29%) patients. 30% (n = 13) presented with AJCC stage 1 disease, 35% (n = 15) with stage 2 disease; 26% (n = 11) with stage 3 disease and 9% (N = 4) with stage 4 disease. The majority were grade 3 tumors (79%).

The non-TNBC group comprised 283 patients (86%). The majority were between 41–50 years (29%) and 51–60 years (31%). 77% (n = 217) were Chinese and 38% (n = 106) were pre-menopausal. 5% (n = 13) had tumors $\leqslant$1 cm, 34% (n = 83) were 1.1–2 cm, 46% (n = 114) were 2–5 cm and 15% (n = 38) were >5 cm. Lymphovascular invasion was seen in 33% (n = 75). 31% (n = 88) presented with stage 1 disease; 35% (n = 107) were stage 2, 19% (n = 55) were stage 3 and 12% (n = 33) were stage 4. The majority were grade 1 or 2 tumors (69%). Lymph nodes were positive in 128 (47%).

Prognostic variables evaluated suggest that TNBC occur more commonly in postmenopausal women ($p = 0.05$) and are high grade ($p < 0.005$). There were no differences for age, ethnicity, tumour size, lymphovascular invasion, staging and nodal involvement.

Conclusion: The incidence of TNBC in our population is similar to Western literature. TNBC are more likely to be high grade tumors. Unlike other studies, TNBC seem commoner in post-menopausal women in our country.

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Breast cancer treatment and outcome in women $\geqslant$50 years old with high familial risk

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Background: Data on impact of family history on presentation, management and outcome of breast cancer are conflicting. In this population based study we compared breast cancer characteristics, treatments and survival among patients 50 years or older with and without a positive family history of breast cancer.

Methods: At the population-based Geneva familial breast cancer registry, we identified all women $\geqslant$50 years diagnosed with primary invasive breast cancer between 1990–2004. Family history was considered as high if $\geqslant$1 first-degree relative had early onset breast cancer, or if 2 or more second-degree relatives had breast/ovarian cancer. We excluded from the analysis patients with moderate or unknown family history.We compared tumor characteristics and treatment between patients with high vs. no family history by means of logistic regression analysis. We used Kaplan–Meier analysis to calculate breast cancer specific survival rates. With Cox proportional hazard analysis we identified factors significantly associated with breast cancer mortality risk adjusting for confounders.