date of the first treatment. SNBM were scored as an event with censoring of the other patients at the time of the last follow-up or of death. Survival curves were derived from Kaplan-Meier estimates and were compared using the log-rank test. Incidence rates of each localisation SNBM found in our groups have been calculated for 100,000 persons – year (PY) for all population of patients and for each of the three groups. The incidence of SNBM was compared between the groups and between each group and the French women population incidence. These comparisons were realised after indirect standardization using the French population as reference, by calculating and testing the Standardized Incidence Ratio (SIR).

Results: *BRCA1/2* mutations were found in 20.6% patients with a family history. Nineteen patients had a *BRCA1* mutation, and 8 had a *BRCA2* mutation. At 10 years of follow up, SNBM free interval was 0.98 [0.97–1.00] in the control group, 0.97 [0.94–1.00] in the *BRCA1/2* non carriers and 0.79 [0.65–0.97] in the *BRCA1/2* carriers ($p < 10–5$). From 8 cancers in "familial group", there were 5 in *BRCA1/2* carriers (4 ovaries and 1 pancreatic carcinoma), and 3 in *BRCA1/2* non carriers (2 ovarian and 1 meningioma). In the group of controls, there were 3 gynaecological tumours (uterine body and cervix) and 1 small cell lung cancer. Of the 5 cases in the group of carriers, there were 4 ovarian and one pancreatic carcinoma in *BRCA1*-carriers and one ovarian cancer in *BRCA2*-carriers. *BRCA1/2* carriers presented more SNBM than the general French women population, SIR = 1099.2 [354.3–2565.4], $p < 10^{-3}$. No differences have been found between non carriers, controls and the French population, SIR = 149.3 [30.0–436.2] and SIR = 80.0 [21.5–204.7]. Familial group of patients (*BRCA1/2+ et BRCA1/2-*) presented higher incidence of ovarian cancers compared to the French population, respectively SIR = 9640.1 [2593.6–24,680.6] with $p < 10^{-3}$ and SIR = 1155.7 [129.8–4172.6] with $p < 0.05$), but no difference was found between controls and the French population, SIR = 0 [0–846.5]. No differences were found between the incidence rates of digestive, gynaecological and lung carcinoma between BRCA1/2 carriers, non carriers and controls and the French population.

Conclusion: At a 10-year median follow-up, the rate of SNBM was higher in *BRCA1/2* mutation carriers than in non-carriers with a family history or sporadic cancers. This difference is related to significantly higher rates of ovarian cancers in this population of patients. There were no differences in the other types of cancers (GI, lung). No difference has been found in the incidence of SNBC in the population of sporadic breast cancer and the general French population.

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Age-specific tumour features, contralateral breast cancer (CBC) risk and survival in BRCA1-associated breast cancer

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Introduction: Breast cancer (BC) in BRCA1-mutation carriers is characterized by specific tumour features, such as a more frequent occurrence of medullary carcinoma, ER-/PR-negativity, grade III tumours and a high incidence of CBC. We investigated whether these characteristics are maintained throughout different age categories considering the age at BC onset. Further, we assessed the prognostic impact of a young age at diagnosis in BRCA-associated and sporadic BC cases.

Methods: In 207 BRCA1-associated and 446 sporadic BC cases we compared tumour characteristics, the CBC rate and BC-specific survival (BCSS) between BRCA1- and sporadic cases separately within three different age groups: first BC diagnosis $\leqslant 35$, 36–49 and $\geqslant 50$ years.

Results: In the age groups < 36, 36–49 and $\geqslant 50$, ER-negativity was 71, 81, and 58%, respectively, in the BRCA1-group, whereas these percentages were 39, 31 and 29%, respectively, in the sporadic group. The difference between BRCA1- and sporadic cases was significant in all three age groups. A higher frequency of the medullary tumour type in the BRCA1-group was only observed in the group affected with BC before the age of 50. In all age groups, grade III tumors were more frequent in BRCA1-cases. However, while the frequency of grade III tumours clearly declined with increasing age at BC diagnosis in sporadic cases (76, 69 and 50%, respectively, p for trend = 0.02), this trend was not found in BRCA1-cases (89, 85 and 89%, respectively, p for trend = 0.83).

The rate of metachronous CBC was significantly increased in the BRCA1-groups as compared to sporadic BC in the age groups $\leqslant 35$ and between 36–49 years (HR 7.1, $p < 0.001$; and 7.6, $p < 0.001$, respectively). After the age of 50, no significantly increased CBC risk was seen for BRCA1-carriers as compared to sporadic cases (HR 1.5 ($p = 0.63$)).

In neither of the three age groups significant differences in BCSS were observed between BRCA1 as compared to sporadic cases. A young age at BC diagnosis ($\leqslant 35$) was an independent unfavourable prognostic factor both for BRCA1- and sporadic BC.

Conclusion: The frequency of the typical tumour characteristics of BRCA1-BC, including the high incidence of a CBC, is age-dependent. Differences between BRCA1 and sporadic cases are most outspoken under the age of 50, with the exception of the frequency of grade III tumours. These findings should be taken into account into the consideration of DNA-testing and prophylactic (contralateral) mastectomy.

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Young patients after BCT are at higher risk of loco-regional recurrence but not for distant metastases

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Background: Breast conserving surgery is associated with a higher risk of loco-regional recurrences, as compared to mastectomy. However, the impact of loco-regional recurrences on overall survival has not been demonstrated in trials which randomized between breast conserving therapy and mastectomy. This means that there is a group of isolated loco-regional recurrences after primary treatment that not lead to distant metastases or death and that are potentially curable. It would be useful if we could identify at the time of primary treatment risk factors associated with an increased risk to develop an isolated loco-regional recurrence followed by distant metastasis. Those risk factors could guide primary treatment choices. We studied whether the effects of risk factors at primary diagnosis associated with distant metastases and primary treatment change after the incidence of isolated loco-regional recurrences. To do this, we re-analysed the data of 3602 patients with early breast stage cancer surgically recruited in three EORTC trials (study 10801, 10854, and 10902).

Method: We modelled breast cancer disease progression as a multi-state model with three states: without any recurrence, with isolated locoregional recurrence, with distant metastasis or death. The following characteristics were considered for each transition: age at diagnosis, tumour size, axillary nodal status, surgical therapy, perioperative chemotherapy, adjuvant chemotherapy, adjuvant radiotherapy, and Tamoxifen®. The predictive ability of all independent variables was measures by adjusted hazard ratios (HR).

Results: Young age ($\leqslant 35$; HR: 2.31, 95%-CI: 1.46–3.67), surgical therapy (breast conserving therapy; HR: 2.14, 95% CI: 1.53–3.01) and having no adjuvant radiotherapy (HR: 1.69, 95%-CI: 1.17–2.45) are significant risk factors for locoregional recurrences.

The incidence of locoregional recurrences is a significant risk factor for distant metastases (HR: 3.95; 95%-CI: 2.00–7.81). This risk remains over time, and will only slowly decrease (HR: 0.95; 95%-CI: 0.87–1.04). Baseline prognostic factors as young age ($\leqslant 35$); breast conserving therapy and having no adjuvant radiotherapy are no significant risk factors for distant metastases after locoregional recurrences.

Discussion/Conclusion: Young patients after BCT are at higher risk of loco-regional recurrence but not for distant metastases.

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Importance of number of examined axillary lymph nodes for assessing the risk of locoregional recurrence (LRR) among breast cancer patients with 1–3 lymph node metastases

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Background: LRR remains a problem in breast cancer, and several studies have shown that postoperative radiotherapy (PRT) may improve survival. PRT is generally accepted when there are more than three involved lymph nodes and the cumulative ten-year LRR risk is at least 20%. In a review of International Breast Cancer Study Group (IBCSG) data, we showed that the subgroup with >20% LRR risk based on peritumoral vascular invasion (VI), tumor grade and tumor size also included some patients with 1–3 involved nodes (Wallgren, et al., Risk factors for locoregional recurrence among breast cancer patients: results from International Breast Cancer Study Group trials I through VII, J Clin Oncol 21:1205–1213, 2003). We have expanded this analysis to include patients from two additional trials. The number of lymph nodes found to be uninvolved on pathological examination was included as a potential risk factor.

Patients: All 6671 patients (2594 node-negative; 4077 node-positive) from IBCSG trials I-IX fulfilling predefined criteria were included. The treatment consisted of modified radical mastectomy without PRT and adjuvant systemic therapy (i.e., at least three courses of CMF chemotherapy or tamoxifen). Central pathology review had been performed for most patients. Multiple regression modeling of the cumulative LRR incidence was used to identify significant predictors of risk.

Results: At a median follow-up of 9–22 years, LRR (with or without distant failure) was found in 1253 patients. The median number of nodes examined was 14. In the node-negative cohort, vessel invasion increased the risk, and number of nodes examined (postmenopausal) decreased the risk of LRR, but no risk group reached 20% 10-year LRR incidence. In the node-positive cohort, number of positive nodes, tumor grade, vessel invasion (premenopausal) and number of uninvolved nodes were significant predictors. Among patients with 1–3 positive nodes a high tumor grade, vessel invasion and few uninvolved nodes defined a high risk for LRR.

Conclusion: A low number of examined nodes in some trials may explain the reported success of PRT in patients with 1–3 involved nodes. When the median number of nodes examined is higher, tumor grade and vessel invasion may define subgroups of patients with breast cancer and 1–3 involved axillary lymph nodes with such a high risk for LRR that PRT may be indicated.

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ONCOPOOL – A European dataset in 16,893 cases of breast cancer

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The SEER data (Henson 1991, Carter 1989) has long been regarded as providing the best information on the characteristics of breast cancers at diagnosis and on outcomes.

Survival has improved greatly since the 1980's across the prognostic range. ONCOPOOL (FP 5 EC Grant) is a dataset from 11 European units, with QA and long term follow up.

Consecutive cases (n = 16,693) in years between 1990 and 1999 were entered. This has given up to date information on treatments and of Pathology and biological factors at diagnosis and the effect of these on recurrence and survival (Tables 1 and 2)

Table 1. Percentages on Pathology

Tumour size (cm)	0–1	1.01–2	20.1–3	3.01–4	4.01–5
%	26	49	19	5	2
Lymph node status	Negative		Positive <4		Positive >4
%	66		24		10
Grade	I		II		III
%	29		42		29

Table 2. Survival according to Nottingham Prognostic Index (NPI)

NPI Group	% in group	% 10 year survival (actuarial)
Excellent	20	95.6
Good	27	91.4
Moderate I	26	81.7
Moderate II	16	72.7
Poor	11	50.8

A great deal more data on presentation, primary and local and systemic adjuvant therapies, pathological and biological make-up, recurrence and survival outcomes are being analysed, ONCOPOOL should now be regarded as the key dataset.

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A rare cancer network multicenter study on phyllodes tumor and sarcomas of the breast

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Objective: Phyllodes tumor (PT) of the breast and primary breast sarcomas (PBS) are rare neoplasms. Their management has been mainly based on surgery. The role of adjuvant treatments such as radiation or chemotherapy (RT) remains unclear. The aim of this study was to evaluate the outcome and identify prognostic factors for local control and survival.

Materials and Methods: Data from 443 women with PT of the breast and 103 breast sarcomas were analyzed. For PT patients, the median age was 40 years (12–87) with a median histologic tumor size of 3 cm (0.5–30 cm). Tumors were classified as benign in 284 (64%), borderline in 80 (18%), and malignant in 79 (18%) cases. Surgery consisted of wide excision in 377 (85%) and mastectomy in 66 (15%) cases. Thirty-nine (9%) patients received adjuvant RT (50 Gy in 25 fractions).

In the PBS patients, median age was 55 years (13–86). Median histologic tumor size was 4.45 cm (0.8–22 cm). There were 42 angiosarcomas. Therapeutic strategy consisted of neo-adjuvant chemotherapy followed by loco-regional treatment in 19 patients, surgery alone in 38, and conservative surgery followed by RT in 30 patients. RT as initial treatment was delivered in 50 patients (50 Gy in 25 fractions).

Results: The median follow-up was 106 and 64 months respectively for PT and PBS patients. Multivariate analysis in **PT** showed six favorable independent prognostic factors for local control: benign histology, no cellular atypia, no residual tumor ((NRT) after initial treatment, total mastectomy, negative margins, and association of RT. For DFS, the four favorable independent factors were benign histology, low number of mitosis, NRT after initial treatment, and no personal history of breast disease.

For PBS, multivariate analysis revealed three favorable independent prognostic factors for local control: NRT after initial treatment, no cellular pleomorphism, and histology other than angiosarcoma. For the DFS, the five favorable independent factors were no menopausal status, NRT after initial treatment, histology other than angiosarcoma, absence of tumor necrosis, and histological grade 1–2.

Conclusions: In this large retrospective study of PT and PBS of the breast, the histological criteria of the tumor and the absence of residual tumor after first treatment are the main prognostic factors for outcome. In PT, while benign tumors have a good prognosis after surgery alone, adjuvant RT should be discussed in the management of malignant and borderline forms. We also confirmed the severe prognosis of angiosarcoma.

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Using changes in gene expression as assessed by microarray analysis of sequential tumour biopsies to predict response to neoadjuvant therapy with letrozole

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Selection of patients for endocrine therapy requires the identification of markers which accurately predict response or resistance. The advent of microarray analysis offers the opportunity to identify novel indices of responsiveness.

In the present study changes in gene expression profiles occurring within 10–14 days have been related to clinical response at 3 months in patients treated neoadjuvantly with letrozole. 58 postmenopausal women with large primary ER-rich breast cancers were treated with letrozole (2.5 mg/daily) for 3 months. Tumour biopsies were taken before and after 10–14 days treatment and RNA from the biopsies used to generate cRNA for hybridization on Affymetrix U-133A chips.

Comparison of gene profiles in paired biopsies confirmed that classical markers of oestrogen action (Trefoil factors 1 and 3, LIV-1, KIAA0101) and proliferation (Cyclin D1, Cyclin B2, CKS2, cell division cycle 2) change with treatment. Clinical response was determined from serial ultrasound measurements and was assessable in 52 cases; 37 (71%) responded (>50% reduction in tumour volume) and 15 were classified