hospitals in the region of the Comprehensive Cancer Centre West (CCCW) have participated into two audit projects (KIM-1 and KIM-2) and one intervention project (MZSB). We investigated to what extend the hospitals succeeded in improving the given care and in maintaining the quality over the years.

Methods: Patients diagnosed with either DCIS or breast cancer within either one of nine hospitals in the region of the CCCW between January 2002 and December 2008 were included into the study. Information was collected about the primary treatment: surgery, radiotherapy, and systemic therapy. Quality indicators were evaluated over the years. In 2006, the multidisciplinary mamma team (MMT) within each hospital received expert advice and feedback to initiate care improvement initiatives. Between 2006 and 2008, the MMT's within each hospital yearly discussed the hospital scores of each indicator and compared those with the highest, the lowest and the mean scores within in the region.

Results: Between 2002 and 2008, an increasing number of patients had been discussed within the multidisciplinary mamma team (MMT) before surgery (69% in 2002, 71% in 2008), or had been discussed within the MMT after surgery (95% in 2002, 96% in 2008). Between 2006 and 2008 almost all patients had had a meeting with a breast cancer-nurse before surgery (on average 92% of the patients). An increasing number of patients visited the outpatient clinic, within 5 working days after admittance (63% in 2002, 81% in 2008), received surgical treatment within 15 working days after diagnosis (46% in 2002, 55% in 2008), and left the hospital within 5 working days after treatment (79% in 2002, 98% in 2008). The number of patients with a successful sentinel node procedure (90% in 2002, 95% in 2008), and with more than 10 lymph nodes after axillary lymph node resection (76% in 2002, 85% in 2008), had been improved over the years. The number of patients with only one surgical intervention varied over the years (between the 85% and the 95%).

Conclusion: The process and the competence of the breast cancer care are of high quality and have been slightly improved. Most of the waiting times have been gradually improved over the years, though need to be further improved. This audit project has increased the insight into the quality of the breast cancer care and contributed to the improvement of this care.

529 Poster

Cost-effectiveness and budget impact of the 70-gene signature for node-negative breast cancer

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Background: The 70-gene signature (MammaPrint®) is a prognostic test used to guide adjuvant treatment decisions in patients with node-negative breast cancer. In order to decide upon its use, a systematic comparative analysis of the effects of the 70-gene signature, the Sankt Gallen guidelines and the Adjuvant Online Software for these patients on survival, quality of life and costs is warranted.

Methods: A Markov decision model was used to simulate the 10-year costs and outcomes (survival and quality-of-life adjusted survival (QALYs)) in a hypothetical cohort of node-negative, estrogen receptor positive breast cancer patients. Sensitivity and specificity of the three tools were based on 5 and 10 years breast cancer specific survival and distant metastasis as first event, derived from a pooled analysis consisting of 305 tumour samples from 3 previously reported validation studies.

Results: Small differences in survival, but substantial differences in quality-adjusted survival between the prognostic tools were observed. St. Gallen showed the highest survival rates compared to the 70-gene signature, but leads to a substantial larger amount of adjuvant chemotherapy and lower cost-effectiveness, thus demanding a high willingness to pay to save a life year. The budget impact (restricted to the mean costs multiplied by the target population) calculated for the Dutch health care with an incidence of 6500 early breast cancers for the St Gallen versus the 70-gene resulted in cost savings of 46.1 million per year. Quality-adjusted survival was highest when using the 70-gene signature, compared to both Adjuvant Online and the St Gallen guidelines. Based on costs per QALY, the 70-gene has the highest probability of being cost-effective for a willingness to pay for a QALY higher then € 15.000.

Conclusions: When deciding upon the cost-effectiveness of the prognostic tests, the 70-gene signature improves quality-adjusted survival and has the highest probability of being cost-effective.

530 Poster

A pilot randomised controlled trial comparing day surgery and inpatient surgery in breast cancer

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Aim: Surgical management of breast cancer has become less invasive over the past decade, making these procedures potentially more suitable for day surgery. The aim of the present study was to establish in a pilot randomised controlled trial whether day surgery improved physical and quality of life outcomes in patients undergoing breast conserving surgery with axillary sampling or sentinel node biopsy compared with inpatient surgery.

Methods: Patients with invasive breast cancer were randomised to day surgery or standard inpatient care. The primary outcomes were physical (wound related, pain, physical activity, nausea and vomiting) and the secondary outcome was quality of life. The physical outcomes were assessed using a surgical site infection (SSI) validated questionnaire and a daily patient diary for the first postoperative week. The quality of life was assessed using a validated Functional Assessment of Cancer Therapy (FACT B) form which was scored at baseline, Day 7 and Day 30 postoperatively. All patients had a 30-day postoperative follow-up. Ethical approval was obtained from the Research Ethics Committee for this trial.

Results: Of the 31 patients randomised, 29 were analysed at the end of the study. There was no significant difference in the physical outcomes (SSI, nausea and vomiting scores, pain scores and physical activity). The quality of life scores for the day group were significantly better compared to the inpatient group on postoperative Day-7, with equivalent results for both groups by Day-30 (Table 1).

Table 1: Changes in FACT B scores 7 and 30 days postoperatively

	Inpatient group (n = 14)	Day patient group (n = 15)	p value
Baseline scores (preoperative)			
FACT G	96.4 (73 to105)	90 (69.6 to 108)	0.458
FACT B	126.2 (104.5 to 138)	118 (89.1 to 143)	0.106
Difference between Day-7 baseline scores			
FACT G	−12.0 (−41.0 to 11.0)*	−3.0 (−20.4 to 11.0)	0.036
FACT G	−15.4 (−44.0 to 10.0)*	−2.9 (−35.3 to 12.0)	0.045
Difference between Day-30 baseline scores			
FACT G	−2.5 (−13.3 to 9.0)	2.0 (−25.6 to 10.0)	0.505
FACT B	−2.5 (−16.3 to 10.7)	5.9 (−40.6 to 13.0)	0.397

*$p < 0.01$ when compared with baseline values within the same group.
FACT G: Functional Assessment of Cancer Therapy − General.
FACT B: Functional Assessment of Cancer Therapy − Breast.

Conclusions: This pilot study showed that day surgery is feasible and safe in patients undergoing breast conserving surgery. When compared to inpatients, day surgery patients had equivalent physical outcomes and a better quality of life outcome by the end of the first postoperative week. A larger randomised controlled trial may be planned based on the results of this pilot study to confirm these results.

531 Poster

Development of a clinical breast cancer database application for the ongoing quality assurance of breast cancer care

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Background: The evolution of new therapies for breast cancer coupled with individualized treatments has led to the need to ensure that evidence based therapies produce desired outcomes. In 2007 the Ottawa Hospital Cancer Centre (TOHCC) Breast Cancer Disease Site Group embarked upon a process of developing and implementing a comprehensive clinical database for all breast cancer patients referred to this academic facility. This database consists of retrospective and prospective (real-time) information derived from both electronic and physical patient records. With over 1000 new breast cancer patients and an ongoing population of over 6000 treatment or follow up visits per year this is clearly a complex, potentially time consuming and expensive undertaking. In order to address these issues the project developed and engaged proprietary knowledge automation technologies to increase the productivity and accuracy of data extraction from electronic

reports (pathology, radiology, consultation and followup notes). The project utilized access controlled Open Source Software to host and deploy the content of the database.

Materials and Methods: All breast cancer referrals with demographic data, as well as all systemic therapy delivered at the outpatient centre, all electronic outpatient lab reports and all radiotherapy treatments were abstracted from TOHCC's clinical system(s). Pathology reports including contemporary molecular prognostic markers were generated electronically from the host hospital's electronic health record and processed with the knowledge automation technology. Extracted information was imported into an Open Source content management system for display of individual clinical patient information.

Results: A total of 27,000 breast cancer referrals have been identified since 1960 at TOHCC. A sample of over 9300 patient referrals since 2000 was the initial target for retrospective and quality assurance analysis. To date, more than 5000 individual unique pathology sample reports have been electronically abstracted on 2400 unique patients, increasing by more than 600 reports for over 300 patients each day. Each pathology report has up to 50 synoptic data elements extracted automatically. There have been more than 3300 patients who have received radiotherapy treatment since 2004 and more than 5400 patients have received systemic therapy. Outcome data on all patients and individual subsets will be generated.

Conclusion: Utilizing knowledge automation technology in association with data extracts from hospital clinical systems we have efficiently created the foundation for ongoing quality assurance of breast cancer care of our patients. Modern oncologic care requires ongoing, efficient quality and outcome assessments.

532 Poster

Clinicopathological features of the triple-negative tumors in Moroccan breast cancer patients

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Background: Triple-negative breast cancer (TNBC) is defined as a group of breast carcinomas that are negative for expression of hormone receptors and HER2, They tend to have a higher grade, with a poorer outcome compared to non-TN breast cancers. Thus only chemotherapy is expected to be effective because no therapeutic targets have yet been established. The aim of this study is to determine the clinicopathological features associated with this type of breast cancer.

Methods: This is a retrospective study of 2004 Breast cancer females collected at the National institute of oncology of Rabat in Morocco, between January 2007 and December 2008. Epidemiological, clinical, histological, therapeutic and evolutive data were analyzed.

Results: A total of 106 women were identified as having triple-negative breast cancer (18.9% of all breast cancer women), with a median age of 45 years (range: 27−89). 74% of women with triple-negative breast cancers were more likely to be under age 50. TNBC were associated most often with invasive ductal carcinomas (85%) and medullar carcinoma (7.5%) and also with a high grade (53% grade III, 33% grade II), vascular invasion was found in 25% of cases. For the tumor size, 13 patient s were classified T1, 64 T2, 16 T3 and 10 T4. For the lymph node involvement: 55 (51.8%) had negative lymph nodes, and 44 had positive lymph nodes. For the TNM staging 9 patients were classified stage I, 59 stage II, 28 stage III and 7 were metastatic at diagnosis.

For treatment modalities 94 patients underwent surgery (radical mastectomy in 64% of cases and 36% had conservative surgery).

Neoadjuvant chemotherapy was administered to 25 patients and adjuvant chemotherapy to 86. All patients received anthracycline based regimen and only 23% received taxanes. Radiotherapy was administered to 71% of patients.

Among the seven metastatic patients at diagnosis 2 progressed after first line chemotherapy. The others had stabilization.

Fourteen (15.4%) patients had a distant failure after adjuvant treatment and one local recurrence, median time to treatment failure was 5 months.

Conclusion: TNBC were associated with young age, high grade tumors, advanced stage at diagnosis (91.5% $\geqslant$ stage II), and short time to relapse. More details about prognosis will be presented at the next meeting.

533 Poster

Knowledge, attitudes, beliefs, behaviour and breast cancer screening practice in Ghana

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Background: Ghanaian women have a low awareness and participation rates in breast cancer screening practises. As a result many patients are diagnosed with advanced disease resulting in poor outcome.

Purpose of the study: The purpose of the study was to explore various factors needed to develop socio-economic and cultural specific models to improve breast cancer care in Ghana.

Methodology: The study which was conducted in Accra and Sunyani involving 474 women, physicians and traditional healers employed both quantitative and qualitative methods. Statistical tests were done on the quantitative data whilst the qualitative data was analysed by constant comparison method.

Findings: Overall, the respondents' knowledge on breast cancer was found to very low, however, higher education levels indicated superior knowledge and a more positive attitude towards breast screening ($U= 3138$, $N = 474$, $p < 0.001$). Respondents in Sunyani performed slightly better in breast self examination than their counterparts from Accra ($= 8.890$, $df = 1$, $p < 0.003$). However no significant difference was noted in clinical breast examination and mammogram rates. The attitude towards the disease range from fear; denial; guilt and spiritual attributes of the disease and linked treatment of the disease with death as many patients die shortly after treatment because of the advanced stage of the disease at treatment. They displayed a high level of reliance on God for protection from the disease, as well as on divine intervention and healing.

Conclusion: The low level of breast cancer awareness among the respondents indicates that the public educational campaigns, intended to educate women in Ghana on breast cancer, are inadequate and ineffective. The initial suggestion that cancer fatalism was a common phenomenon in Ghana was supported by the findings of the study. The study came to the realization that routine mammography screening will be very difficult to implement in Ghana at the moment due to lack of capacity and other socioeconomic factors. The study therefore proposes a model based on current socio-cultural and economic development in the country. The first approach to the model is to increase awareness and encourage the women to undertake BSE and report any suspicious findings for clinical evaluation. The second is to encourage wide spread adoption of CBE. Traditional healers can also be educated to recognize breast cancer and be encouraged to refer suspicious lesions. The few mammogram centres can then be used for diagnostic purposes and screening for high risk or symptomatic women. Provision of treatment facilities and development of an efficient early referral system are stressed.

534 Poster

Individualized breast cancer follow-up; cost-effectiveness of various scenarios

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Background: More than 12.000 women are diagnosed with breast cancer annually in the Netherlands. Prognosis after primary treatment is improving. This leads to an increased number of follow-up visits and thus increasing workload to specialists. Although the treatment for breast cancer patients is individualized, national guidelines currently assign all these patients to one and the same follow-up programme: a schedule for 5 years, 4 visits in the first year, 2 visits in the second year and an annual visit in the last three years. The present study was undertaken to determine an individualized follow-up programme in order to give women the follow-up they need and to reduce workload.

Methods: Breast cancer patients were classified according to different risk groups for recurrence based on age, tumour size and lymph node status. We chose follow-up programmes with different frequency (once, twice per year), length (one, three, five years). To determine the most appropriate follow-up programme for each patient group we calculated the cost-effectiveness of current versus individualized treatment in a Markov model, where the risk of a recurrence, second primary tumour, metastases and mortality were included.