Scientific Session Awards

Abstracts presented at the Society's annual meeting will be considered for the following awards:

- The **George Peters Award** recognizes the best presentation by a breast fellow. In addition to a plaque, the winner receives $1,000. The winner is selected by the Society's Publications Committee.

  The award was established in 2004 by the Society to honor Dr. George N. Peters, who was instrumental in bringing together the Susan G. Komen Breast Cancer Foundation, The American Society of Breast Surgeons, the American Society of Breast Disease, and the Society of Surgical Oncology to develop educational objectives for breast fellowships. The educational objectives were first used to award Komen Interdisciplinary Breast Fellowships. Subsequently the curriculum was used for the breast fellowship credentialing process that has led to the development of a nationwide matching program for breast fellowships.

- The **Scientific Presentation Award** recognizes an outstanding presentation by a resident or fellow. The winner of this award is also determined by the Publications Committee. In addition to a plaque, the winner receives $500.

- All presenters are eligible for the **Scientific Impact Award**. The recipient of the award, selected by audience vote, is honored with a plaque.

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Oral Presentations

(in order of presentation)

Friday May 4, 2012

Saturday, May 5, 2012

"Quickshot" Presentations

(in order of presentation)

Saturday, May 5, 2012

Poster Presentations

(listed alphabetically according to first author's last name)

Oral Presentations

Friday, May 4, 2012 (listed in order of presentation)

0191 A Multidisciplinary Approach to Breast Cancer Care Improves Patient Outcomes

Rachel L Farkas, Peter Salzman, Margie Richardson, Jacob Moalem, Kristin A Skinner
University of Rochester, Rochester, NY, USA

Objectives: A multidisciplinary (MD) approach to cancer care has been proposed as a means to improve outcomes, but such an improvement has never been documented. The MD approach has been shown to improve patient satisfaction, time to diagnosis, and appropriateness of treatment in breast cancer patients, but has never been shown to improve disease-specific or overall survival. In 1996, a subset of providers at our institution elected to come together to form a MD breast program. Participation was voluntary and ultimately accounted for about 50% of patients undergoing surgery for breast cancer in our institution. Participants in the Multidisciplinary Breast Program (MDBP) attend breast cancer tumor boards and CME conferences weekly, participate in joint MD clinics, and lead various outreach and educational events. Independent practitioners (IP) participated in no formal MD activities. Registry data was used to assess whether MD care affected outcomes.
Method: The cancer registry was used to identify all patients having surgery for breast cancer in our institution from January 1999 through November 2009. Patients were excluded if they did not have an operation, no surgeon could be identified, or their surgeon performed less than 1 breast case per year on average. Each surgeon was designated as a specialist or not, high- vs low-volume breast surgeon (based on definitions in the literature), and participant in the MDBP or not. The surgeon and patient characteristics were compared using standard methods for contingency tables. Univariate and multivariate analysis was performed to determine factors associated with survival. Variables included in the analysis included patient age, cancer stage, lymph node status, type of surgery, and surgeon characteristics (specialization, volume, participation in MDBP).
Results: The registry identified 4,144 individual patients who underwent surgery at our institution. Table 1 shows the patient and physician characteristics. By univariate analysis, factors predicting DFS and OS ($p < 0.05$) include patient age, stage, type of surgery, MD approach, and surgeon specialization. By multivariate analysis, controlling for all of these factors, as well as surgeon volume, MD care remained an independent predictor of both overall and disease-free survival.
Conclusions: Surgeons participating in the MDBP were more likely to be specialists and high-volume surgeons. Patients treated by members of the MDBP were more likely to undergo breast-conserving surgery and experienced a 37.5% reduction in the risk of dying compared to those treated by IPs. This effect on survival was independent of extent of disease and patient age. This is the first time that a survival benefit has been demonstrated for MD cancer care.

0136 Long-Term Results of Excision Followed by Radiofrequency Ablation (eRFA) as the Sole Local Therapy for Breast Cancer

Misti Wilson, Sohelia Korourian, Christiano Boneti, Laura Adkins, Brian Badgewell, Jeanette Lee, V Suzanne Klimberg
University of Arkansas for Medical Sciences, Little Rock, AR, USA

Objectives: Clinical trials have yet to find a size or grade of invasive cancer that can be treated with lumpectomy alone due to the higher local recurrence (LR) rate without radiation (XRT). Even with advanced tumor localization techniques and our best efforts, a large percentage of patients require re-excision for positive margins, which can be costly, time-consuming, and stressful for the patients. Adjuvant radiation also adds significant cost and morbidity to the breast cancer patient treatment regimen. Excision followed by radiofrequency ablation (eRFA) is an intraoperative method that utilizes heat to create an additional tumor-free zone around the lumpectomy cavity approximating the zone treated by brachytherapy. We hypothesized that eRFA after lumpectomy for invasive breast cancer could reduce the need for re-excision by extending the margin of tumor-free zone and maintain local control without XRT.
Method: We conducted an IRB-approved Phase II trial of patients with invasive breast cancer receiving lumpectomy followed by immediate intraoperative eRFA. Patients with tumors less than or equal to 3 cm with clinically negative nodes were included. A standard lumpectomy was performed then the RFA probe was deployed 1 cm circumferentially into the walls of the lumpectomy cavity. RFA maintained at 100 degrees C for 15 min has been shown in preclinical and clinical data to extend the lumpectomy margin by 1 cm. Validated Doppler sonography was used to determine final ablation size. Cosmesis was good. Standard H&E of

lumpectomy margins was performed. None of these patients received XRT. Only patients with grossly positive margins or residual calcifications on postoperative mammography were re-resected. Patients were followed every 6 months for the first 2 years and yearly thereafter with mammogram and physical exam.
Results: Sixty patients (mean age of 68.7 ± 11.4 years) with invasive cancer who had an average tumor size of 1.1 cm ± 0.61 (range, 0.2 to 2.5 cm) underwent excision followed by radiofrequency ablation. Fifty-six patients had invasive ductal carcinoma and 4 had invasive lobular carcinoma. Thirty-three patients had grade I disease, 21 had grade II, and 6 had grade III. Margins were negative in 44, focally positive in 3, close in 11, and grossly positive in 2. Fourteen of 16 (87%) patients with close or positive margins were spared re-excision. Thirty-three patients were treated with hormonal therapy. Overall there were 5 deaths total, none of which were related to their primary disease. After follow-up for 44 (12-84) months, only 1 patient (1.7%) developed an in site recurrence. There was 1 recurrence at another site. Average cosmesis rating was good to excellent.
Conclusions: Long-term follow-up suggests that eRFA could reduce the need for re-excision, as well as reduce local recurrence for invasive breast cancer treated without XRT. For selected breast cancer patients undergoing breast conservation therapy, eRFA is an attractive alternative to breast irradiation. This concept has recently initiated a multicenter register trial called ABLATE (Adjunctive Breast Lumpectomy With RF Ablation Treatment to Reduce Re-Excision & Recurrence) in patients undergoing conservative breast surgery.

0055 American College of Surgeons (ACOSOG) Z0011: Impact on Surgeon Practice Patterns
Abigail Caudle, Kelly Hunt, Anthony Lucci, Susan Tucker, Henry Kuerer, Funda Meric-Bernstam, Sarah Gainer, Ruchita Shah, Gildy Babiera, Aysegul Sahin, Elizabeth Mittendorf
*University of Texas MD Anderson Cancer Center, Houston, TX, U*SA
Objectives: The ACOSOG Z0011 trial demonstrated that select women with early-stage breast cancer found to have ≤2 positive sentinel lymph nodes (SLN) could safely omit completion axillary lymph node dissection (ALND). The goal of this study was to determine the impact of these results on the practice patterns of breast surgical oncologists at a comprehensive cancer center.
Method: A review of practice patterns of 17 breast surgical oncologists at our institution was undertaken comparing the year prior to release of the Z0011 results (3/1/09-2/28/10) to the year after an institutional multidisciplinary meeting discussing the Z0011 results (9/1/2010-9/1/2011). Patients meeting the Z0011 inclusion criteria (clinical T1-2/N0 breast cancer undergoing breast- conserving therapy) were identified. Clinicopathologic and operative data were obtained and comparisons made between the 2 groups using Fisher exact test for categorical variables and the Mann-Whitney test or logistic regression for continuous variables as appropriate. All tests were 2-sided.
Results: Six hundred fifty-eight patients meeting the Z0011 eligibility criteria were identified: 335 in the pre-Z0011 results group and 323 in the post-Z0011 results group. Sixty-two (19%) patients were SLN positive in the pre-Z0011 group vs 42 (13%) in the post-Z0011 group (p = NS). Patient demographics were similar between groups with respect to tumor size, T stage, histology, grade, ER/PR status, and HER2 status; however, the pre-Z0011 patients had a higher rate of lymphovascular invasion (16% vs 10%, p = .02) and there were fewer postmenopausal patients (72% vs 80%, p = .02). Before the Z0011 results, 85% (53/62) of SLN-positive patients underwent ALND vs 24% (10/32) in the year post-Z0011 results (p < .001). This trend has become more pronounced over time: 40% (10/25) of SLN positive patients underwent ALND in the first 6 months after the results were published while only 18% (3/17) had ALND in the subsequent 6 months. After the Z0011 results were published, surgeons were more likely to perform ALND on patients with larger tumor size (median, 2.2 cm in ALND group vs 1.5 cm in non-ALND, p = NS), lobular histology (30% vs 3%, p = .01), those with a smaller number of SLNs retrieved (median, 1 vs 3, p = NS), larger SLN metastasis (median, 4 mm in ALND vs 2.5 mm in non-ALND, p = NS), evidence of extranodal extension (20% vs 6%, p = NS), or a higher probability of positive non-SLNs by a validated nomogram (median predicted probability, 25% vs 14%, p = .03). After the Z0011 results were reported, surgeons were less likely to perform intraoperative nodal assessment: 26% post-Z0011 vs 69% in the year pre-Z0011 (p < .001). In SLN-negative patients, this contributed to a decrease in operative time (median, 92 min pre-Z0011 vs 79 min post-Z0011, p < .001).
Conclusions: Breast surgical oncologists at our institution have implemented the results of the ACOSOG Z0011 trial for the majority of patients meeting the trial inclusion criteria; however, additional clinical and pathologic considerations still impact the decision to omit or perform an ALND. Acceptance of the Z0011 results has significantly impacted on our practice by decreasing the number of patients undergoing ALND, decreasing the use of intraoperative nodal evaluation, and decreasing operative times.

0149 Balancing Venous Thromboembolism Prophylaxis and Hematoma in Breast Surgery Patients– Comparison of 30-Day Outcomes From the National Surgical Quality Improvement Program

Jenna Lovely, Sharon Nehring, Judy Boughey, Amy Degnim, Rajakumar Donthi, W. Scott Harmsen, James Jakub

Mayo Clinic Rochester, Rochester, MN, USA

Objectives: Our institution's standard for venous thromboembolism prophylaxis (VTE-P) in patients undergoing breast surgery is based on the belief that the VTE risk is lower compared to the overall general surgery patient population and that a cancer diagnosis, in and of itself, is not risk enough to warrant perioperative pharmacologic prophylaxis (PCP). We hypothesize the risk/benefit ratio favors selective, as opposed to routine, PCP in patients undergoing breast surgery. The purpose of this study was (1) to determine our institution's current PCP utilization and perioperative rates of VTE and hematoma requiring reoperation for patients undergoing breast surgery and (2) to compare our breast surgery VTE rate with our general surgery population as a whole and between institutions within the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP).

Method: A retrospective review of the prospectively collected ACS NSQIP data set from April 2006 to June 2010 was undertaken. The institution's 30-day VTE rates and hematomas requiring reoperation were reviewed for breast surgery patients. Our VTE rate for patients undergoing breast surgery was compared to our general surgery patient population and to the ACS NSQIP general surgery population.

Results: Among 4,579 breast operations performed at our institution over this time period, 988 (21.6%) were captured and analyzed through the ACS NSQIP process; 752 were for cancer and 236 were for benign disease. Sequential compression devices and early ambulation were utilized for all patients, and 147/752 (19.5%) cancer patients received PCP. In our cancer patients the hematoma rate requiring reoperation was 3/147 (2.0%) in those receiving PCP and 12/605 (2.0%) in those not receiving PCP (p = 1.0). Our VTE rate for all breast operations was 4/988 (0.4%); 0/236 for those with benign disease and 4/752 (0.5%) in those with breast cancer (p = 0.58). Three VTEs occurred in patients not receiving PCP (3/605, 0.5%) and 1 in a patient receiving PCP (1/147, 0.7%, [p = 0.58]). Our breast surgery patients (4/988, 0.4%) had an equivalent VTE rate compared to our institutional general surgery population (63/9643 [0.7%, p = 0.254]) and was only different from our institutional gastric bypass group which had no VTEs in the sample (0/261, p = 0.05). Over the same time period, 687,029 general surgery patients from the ACS NSQIP data set were used for comparison. Our VTE rate in breast surgery patients of 0.4% was not significantly different from the national ACS NSQIP VTE rate 0.7% for the overall general surgery patient population (p = 0.29).

Conclusions: This study shows our current standard of practice for VTE-P (sequential compression devices, aggressive ambulation and selective use of PCP in only high-risk patients) results in a VTE rate similar to our institutional general surgery population and similar to the general surgery ACS NSQIP cohort. This supports the American Society of Breast Surgeons VTE prophylaxis guidelines, which do not recommend routine PCP. We conclude that better defining which breast surgery patients will benefit from PCP is still needed to optimally balance the risk/benefit for this subset of general surgery patients.

Table1. Hematoma Requiring Reoperation and VTE Rates in Breast Cancer Surgery Patients

		Hematoma			VTE		
	N	**n**	**Percent (95% C.I.)**	**P value†**	**n**	**Percent (95% C.I.)**	**P value†**
Overall	752	15	2.0%	--	4	0.5%	--
PCP use							
No	605	12	2.0 (1.0-3.4)	1.0	3	0.5% (0.1 – 1.4)	0.58
Yes	147	3	2.0% (0.4–5.9)		1	0.7% (0.0 – 3.8)	

†Significance test for association of use of pharmacologic agent with occurrence of hematoma requiring hematoma and VTE within 30 days using a Fisher exact test.
PCP = pharmacologic prophylaxis

0267 Surgical Delay of the Nipple-Areolar Complex: A Powerful Technique to Maximize Nipple Viability Following Nipple-Sparing Mastectomy

Jay Jensen[1], Jennifer Lin[1,2], Nimmi Kapoor[1], Armando Giuliano[2]
[1]John Wayne Cancer Institute, Santa Monica, CA, USA, [2]Cedars-Sinai Medical Center, Los Angeles, CA, USA

Objectives: Nipple-sparing mastectomy (NSM) improves cosmetic outcome of mastectomy, but many patients are not good candidates for this procedure because of concerns about nipple-areolar viability. Surgical delay is a technique that has been used for more than 400 years to improve survival of skin flaps. We used a surgical delay procedure to improve nipple viability in patients who were identified to be at high risk for nipple necrosis following NSM. The purpose of the delay procedure is to induce ischemia of the nipple-areolar complex (NAC) during the 7-14 days prior to mastectomy, thus stimulating the hypertrophy (or ingrowth) of blood vessels in the "delayed" tissue and thereby minimizing the risk of nipple loss after mastectomy.

Method: Patients at high risk for nipple necrosis following NSM were identified by the following criteria: (1) breast scars which would restrict blood supply to the nipple; (2) patients who would have long mastectomy flaps (as determined by a nipple to notch distance of greater than 26 cm); (3) history of recent cigarette use. Patients who desired NSM and had any risk factors underwent a surgical delay procedure 7 to 14 days prior to mastectomy. The surgical delay procedure consisted of elevating a near full-thickness skin flap of the NAC and a few centimeters of surrounding mastectomy flap in the anatomical plane of the mastectomy. Subareolar biopsy and sentinel node biopsy, if indicated, was performed at the time of the delay procedure. Nipple viability was assessed before and after NSM. If the subareolar biopsy revealed malignancy, the NAC was removed at the time of mastectomy.

Results: Twenty-four NAC in 16 patients underwent surgical delay. Of the 24 NAC subjected to the delay procedure, 10 had previous complete circumareolar incisions, 5 had scars at or near the areolar margin that would restrict blood supply to the postmastectomy nipple, 5 had breast ptosis as proven by a suprasternal notch to nipple distance greater than 26 cm, and 1 was a chronic smoker. All of the NAC subjected to a surgical delay survived following the delay procedure. In 2 patients, the subareolar biopsy was positive and 3 NAC were removed at the time of mastectomy (1 for purposes of symmetry). Of the 21 delayed NAC left at the time of NSM, all survived the postmastectomy course.

Conclusions: A procedure to surgically delay the NAC 7 to 14 days prior to NSM is demonstrated to ensure viability of NAC in patients previously thought to be at high risk for nipple loss. A surgical delay operation allows patients who would otherwise be considered to be at high risk for postmastectomy nipple necrosis to enjoy the benefits of NSM.

0253 Expression of BC200 RNA in Peripheral Blood of Breast Cancer Patients

Charusheela Andaz[1], Anne Renteria[1], Jeffin Mathew[1], Rachel Hayon[1], William Solomon[1,2], Patrick Borgen[1], Theresa Jacob[1,2]
[1]Maimonides Medical Center, Brooklyn, NY, USA, [2]State University of New York, Health Science Center at Brooklyn, Brooklyn, NY, USA

Objectives: Neural BC200 RNA is an RNA polymerase III transcript that is expressed in the human nervous system. Additionally, BC200 RNA is expressed in germ cells, and in various tumors, including tumors of the breast, but not in the corresponding normal tissues or adjacent noncancerous areas. Members of our team (AI, HT) previously demonstrated that this RNA is expressed in high levels in tumor tissues from invasive carcinomas of the breast. Further, it was shown that BC200 levels in ductal carcinomas in situ were a function of the tumor grade and BC200 could be developed as a diagnostic and prognostic molecular marker of malignancy. Here, our objective was to elucidate the diagnostic value of BC200 blood test in a clinical setting and examine the expression pattern of BC200 in relation to HER2 and lymph node status.

Method: Peripheral blood samples were collected from 98 patients undergoing breast surgery for tumor resection. The patients ranged in age from 34 to 85 years and were of various ethnicities (Figure 1). All patients provided consent for participating in the study and signed an IRB-approved informed consent form. Blood samples were taken preoperatively and 2 hours after completing the surgery, were immediately placed on ice, and then frozen until RNA extraction. BC200 levels were established in the samples by performing real-time quantitative RT-PCR (qRT-PCR) with the isolated whole blood total RNA. The housekeeping gene for acidic RNA protein was used as internal control. Analyses were stratified by HER2 status and lymph node involvement.

Results: Our data demonstrate that there is differential expression of BC200 RNA in peripheral blood of breast cancer patients. The expression of BC200 RNA rose significantly following tumor resection. BC200 RNA level was 43% higher in postoperative blood samples as compared to those taken just before the surgical procedure. However, this difference was not observed in the peripheral blood from patients who were benign. In the cohort of invasive carcinoma cases, the Her2 status affected the BC200 RNA levels more than tumor size or grade (Figure 2). Both preoperative and postoperative blood levels of BC200 RNA increased proportionately with increased lymph node involvement. Samples from N0i+, N1 and N2 status patients showed BC200 levels that were, respectively, 2-fold, 4-fold, and 5-fold increase of control.

Fig 1: Study Patient Population - Ethnicity

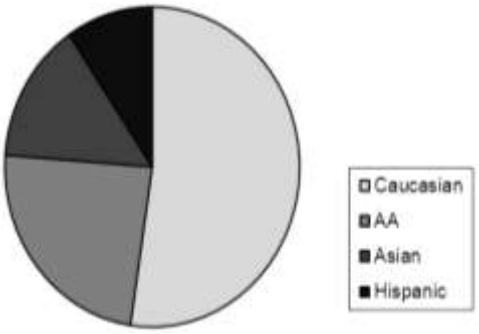
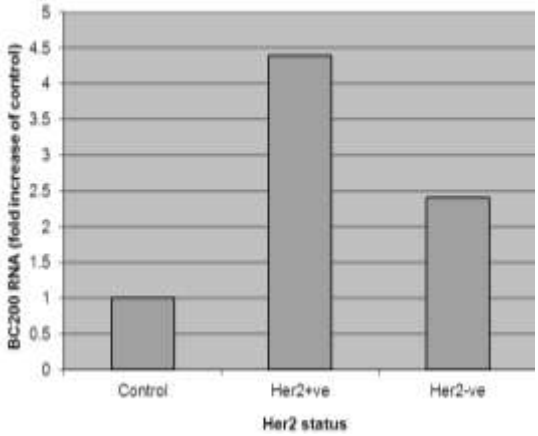


Fig 2: Blood levels of BC200 RNA in invasive breast carcinoma patients



Conclusions: BC200 RNA is present in significantly high levels in peripheral blood of breast cancer patients. These data are in concordance with results from breast carcinoma tissue samples. In patients with invasive carcinomas, expression of BC200 RNA appears to be related to expression pattern of proliferation markers such as HER2, with cases positive for this marker showing several-fold increase in its blood levels. Lymph node metastasis also appears to affect BC200 levels. For establishing the diagnostic and prognostic power of blood levels of BC200, longitudinal analyses are needed. Toward this goal, the above patients are being followed and data collection is ongoing.

0127 When Is a Lymph Node Dissection a Lymph Node Dissection? The Number of Lymph Nodes Resected in Sentinel and Axillary Lymph Node Dissections

Windy Olaya[1], Jan Wong[2], John Morgan[3,4], Kevork Kazanjian[1], Sharon Lum[1,4]

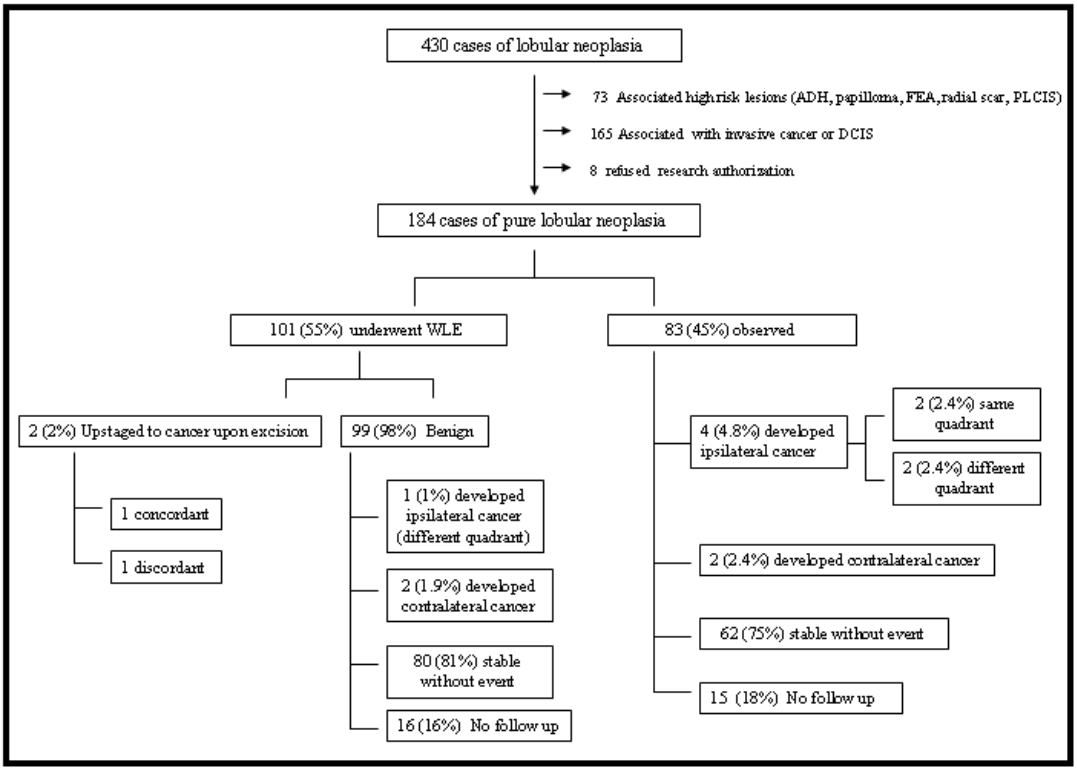
[1]Department of Surgery, Division of Surgical Oncology, Loma Linda University School of Medicine, Loma Linda, CA, USA, [2]Department of Surgery, Division of Surgical Oncology, Brody School of Medicine, East Carolina University, Greenville, NC, USA, [3]Department of Epidemiology & Biostatistics, Loma Linda University School of Public Health, Loma Linda, CA, USA, [4]California Cancer Registry, Desert Sierra Cancer Surveillance Program, Loma Linda University, Loma Linda, CA, USA

Objectives: The use of axillary staging with sentinel lymph node dissection (SLND) rather than axillary lymph node dissection (ALND) has been proposed as a quality measure of breast cancer care. However, surgical axillary staging procedures have been standardized by technique rather than actual number of lymph nodes (LN) removed. For full ALND, the NSABP B-32 protocol recommended a minimum of 6 LN resected, while the ACOSOG Z-11 protocol mandated a minimum of 10 LN. For SLND, no such criteria exist; the average number of LN resected during SLND in NSABP B-32 was 3. We sought to compare the number of lymph nodes resected in axillary and sentinel lymph node dissections and to assess the validity of registry reporting for axillary staging in breast cancer.

Method: All female patients who underwent surgical axillary staging for T1/T2, M0 breast cancer between 2004 and 2008 with records in the California Cancer Registry were evaluated. Patients reported as undergoing SLND, SLND+ALND, and ALND alone were compared by number of LN resected. The number of LN resected in patients reported as having SLND+ALND and ALND were assessed for compliance with the NSABP 6 LN threshold or ACOSOG 10 LN threshold definitions for axillary dissection. The proportion of patients with 3 or fewer LN was assessed for patients reported as having SLND only. The numbers of LN resected in each of the recorded surgical axillary staging groups were compared by patient age, T stage, type of breast operation,

cancer program approval by ACOS, and year of diagnosis using Pearson's chi-square and logistic regression analyses.
Results: Of 71,907 women studied, 45% were reported as having SLND; 24%, SLND+ALND; and 31%, ALND. Mean (±SD) number of LN resected with SLND cases was 2.4 (±2.1); SLND+ALND, 10.4 (±7.2); and ALND, 11.4 (±7.4) ($p < 0.0001$). Of patients reported as having initial ALND alone, 75.5% had ≥6 LN removed and 56.7% had ≥10 LN removed ($p < 0.0001$). Of those having SLND+ALND, 67.8% had ≥6 LN removed and 46.2% had ≥10 LN removed ($p < 0.0001$). Of those reported as having only SLND, 83.4% had ≤3 LN removed. Regardless of surgical axillary staging group, women were statistically more likely to have a greater number of LN removed if they had a mastectomy or T2 tumor, were younger than 65 years, or were treated at a non-ACOS approved cancer program. The number of LN resected did not vary significantly by year of diagnosis.
Conclusions: Depending on criteria used, one quarter to one half of patients did not meet the minimum LN count threshold for full ALND; nearly one fifth had an excess of LN removed in a SLND. These results demonstrate significant variation in LN counts and the potential for misclassification in a registry database when defining surgical axillary staging procedures based upon LN counts alone. Further investigation is required to determine whether absolute LN number or reported operative procedure and implied surgical technique better defines axillary staging.

0235 Long-Term Follow-up of Lobular Neoplasia (ALH/LCIS) Diagnosed on Core Needle Biopsy
Miraj Shah-Khan[1], Xochiquetzal Geiger[2], Carol Reynolds[1], James Jakub[1], Elizabeth DePeri[2], Katrina Glazebrook[1]
[1]Mayo Clinic, Rochester, MN, USA, [2]Mayo Clinic, Jacksonville, FL, USA
Objectives: Lobular neoplasia (LN) refers to a spectrum of lesions consisting of atypical lobular hyperplasia (ALH) and lobular carcinoma in situ (LCIS). LN is often an incidental finding on breast core needle biopsy (CNB) and management remains controversial. The objective of this study is to define the incidence of malignancy in women diagnosed with LN on CNB and to identify a subset of patients in which these lesions can be observed. Our study attempts to define the natural history of LN by evaluating a large group of patients with pure LN, not associated with a high-risk lesion, with long-term follow-up.
Method: We performed a retrospective review of patients diagnosed with ALH or LCIS on CNB between 1/1993 and 12/2010 at our institution. Patients with an associated high-risk lesion, including pleomorphic LCIS, atypical ductal hyperplasia, papilloma, radial scar, and flat epithelial atypia were excluded, as were patients with ipsilateral malignancy at time of diagnosis. All radiologic and pathologic specimens were reviewed. Factors assessed included: imaging indication/modality, ALH vs LCIS, presence of calcifications within the CNB, and pathologic-radiologic concordance. Patients were followed for the development of breast cancer.
Results: Over this time period 13,765 CNB were performed at our institution. Four hundred thirty cases of LN were identified. Two hundred forty-six lesions were excluded due to the presence of an associated high-risk lesion on CNB or synchronous ipsilateral cancer. One hundred eighty-four (1.3%) cases of pure LN from 180 patients were identified and comprise the study cohort included for analysis. There were 147 (80%) ALH cases and 37 (20%) LCIS cases. One hundred seventy-one (93%) cases demonstrated pathologic-radiologic concordance and 13 (7%) were nonconcordant. One hundred one (55%) cases underwent surgical excision within 6 months of CNB and 83 (45%) were observed. Mean follow-up time for all patients was 51 months (3-212). The majority (75%) of CNB were performed for microcalcifications, 21% for a mass, and 5.4% for MRI enhancement. One of 81 (1.2%) ALH cases excised was upstaged to ductal carcinoma in situ (DCIS). This lesion exhibited radiologic-pathologic discordance on CNB. One of 20 (5%) LCIS cases excised was upstaged to invasive lobular cancer (ILC). This lesion was noted to be concordant on initial CNB. In the cohort of patients with LN that were observed, 4/83 (4.8%) developed ipsilateral cancer during follow-up. Of the cases of LCIS observed, 3/17(17.6%) developed ipsilateral cancer (2 ILC at 37 and 60 mo, 1 DCIS at 78 mo). One ipsilateral ILC was in the same quadrant as initial CNB. In patients observed with ALH, 1/66 (1.5%) developed an ipsilateral, same quadrant DCIS at 7 mo. Four of 184 (2%) patients with LN developed a contralateral cancer during observation.



Conclusions: Forty-five percent of the pure LN lesions diagnosed by CNB were observed at our institution over this study period. These data suggest that not all patients with LN diagnosed on CNB require surgical excision. Patients with ALH, not associated with a high-risk lesion and demonstrating radiologic-pathologic concordance, may be safely observed. There also may be a group of patients with classic LCIS that can be observed; however, this study is underpowered to be definitive in this regard.

0260 Biology, Not Choice of Mastectomy vs Lumpectomy, Dictates Recurrence in High-Risk Breast Cancer

Elizabeth L. Cureton[1], Michael D. Alvarado[1], Christina Yau[2], Helen Krontiras[3], David W. Ollila[4], Cheryl A. Ewing[1], Sindy Monnier[1], Laura J. Esserman[1]

[1]University of California, San Francisco, San Francisco, CA, USA, [2]Buck Institute for Aging, Novato, CA, USA, [3]University of Alabama, Birmingham, Birmingham, AL, USA, [4]University of North Carolina, Chapel Hill, Chapel Hill, NC, USA

Objectives: Increasingly, women with stage 2 and 3 breast cancers are receiving neoadjuvant therapy. At the completion of neoadjuvant therapy, the majority of women can have breast conservation. The question often arises in the setting of modern neoadjuvant therapy, is breast conservation oncologically safe even in the setting of residual disease. We used the experience of the I-SPY 1 trial to gauge the level of local recurrence in the setting of maximal multidisciplinary treatment.

Method: To be eligible for the I-SPY 1 trial, patients had to have tumors ≥3 cm. Women from 9 clinical centers received neoadjuvant doxorubicin and cyclophosphamide, followed by paclitaxel, followed by definitive surgical therapy, and then received radiation as deemed appropriate by the treating physician. To determine whether surgical procedure and type of response or lack thereof influenced the local recurrence rate, we separated the data into those with and without pathologic complete response (pCR) and by residual cancer burden (RCB) 0 or 1 vs 2 or 3 (complete or near-complete response vs less-complete response).

Results: Of the 236 patients enrolled in the I-SPY 1 trial, 206 were available for this analysis. Ninety-one percent of patients in this trial were classified as biologically high risk on the basis of a 70-gene expression profile. The mean tumor size was 6.9 cm, and the tumors were 44% hormone receptor positive, 24% HER-2/neu positive, and 32% triple negative. Median follow-up was 3.9 years. Of the 206 patients, 45 patients (21%) had a distant recurrence. However, only 14 patients (6.8%) had local recurrence (LR). Of the 14 that had a local recurrence, 9 (64%) had synchronous distant metastases and recurred 2 years of diagnosis, 1 had

a metastasis within 2 years of local recurrence, and 4 have not had a distant recurrence. Developing a local recurrence was significantly associated with developing a distant recurrence ($p = 0.00005$). Stage and size at clinical presentation and nodal status at operation after neoadjuvant chemotherapy were significantly associated with recurrence ($p < 0.0001$, $p < 0.0001$, and $p = 0.0006$, respectively). Local recurrence rates were not statistically significantly different in women with lumpectomy compared to mastectomy, nor did they differ in the setting of an excellent response to therapy (pCR or RCB 0,1) or in the setting of residual disease (no pCR or RCB of 2,3). Tumor subtype certainly influences recurrence rate, but the number of local recurrences were too small to meaningfully evaluate the association.
Conclusions: Overall, these high-risk patients with maximal multidisciplinary treatment had a low risk of local recurrence, and those patients with higher risk of recurrence were those with more aggressive biological features, such as lack of pathologic complete response. In this high-risk patient population, local recurrence does not appear to be a causative factor for future progression but rather an indication of aggressive tumor biology. When radiation is going to be part of treatment, lumpectomy may be associated with fewer complications than mastectomy, reconstruction, and radiation treatment and should therefore be a consideration.

0228 Health Policy Changes and the Differential Effects on Immediate Breast Cancer Reconstruction Across Insurance Groups
Rachel Yang, Andrew Newman, Caroline Reinke, Ines Line, Giorgos Karakousis, Brian Czerniecki, Liza Wu, Rachel Kelz
University of Pennsylvania, Philadelphia, PA, USA
Objectives: In order to improve access to reconstruction for postmastectomy patients, Pennsylvania adopted the Breast Cancer Reconstruction Surgery Coverage Act in 1997. Additionally, federal policies were passed in the years of 1998-2002 further mandating insurance coverage of all postmastectomy breast reconstruction. The effects of these policy changes on patients with different insurance type have yet to be evaluated.
Method: Patients greater than 18 years old who had mastectomy were identified in the Pennsylvania Health Care Cost Containment Council inpatient database for 1994-2004. International Classification of Disease-9 procedure codes were used to identify patients who underwent immediate breast reconstruction (IBR). Rates of IBR prior to (1994-1997) and following (2001-2004) the federal and state policy changes were examined by insurance type, year, race, age, median income, and Elixhauser comorbidity index using a chi-square test. Multivariable logistic regression analysis was performed to evaluate the relationship between insurance type and IBR before and after the policy changes with adjustment for potential confounders.
Results: We identified 35,206 patients who underwent a mastectomy during the study time interval, with 18.49% undergoing IBR prior to policy changes and 27.58% following policy changes. Prior to policy changes, the adjusted model showed that only Medicare patients were significantly less likely to undergo IBR (OR 0.51; 95% CI, 0.39-0.68) when compared to patients with private insurance. Following the policy changes, the adjusted model showed that patients with Medicare and Medicaid were less likely to undergo PMBR (OR 0.42; 95% CI, 0.34-0.48; OR 0.39, 95% CI, 0.32-0.63, respectively) when compared to patients with private insurance. Rates of IBR in privately insured patients increased from 31.27% prior to policy changes to 47.64% following policy changes, but in Medicaid patients decreased from 25.0% prior to policy changes to 21.43% following policy changes.
Conclusions: Changes in national and Pennsylvania policy did not impact all insurance groups equally. Privately insured patients benefitted most from the policy changes, while disparities in IBR remained in both Medicare and Medicaid patients. Future studies are needed to determine how underserved groups can acquire greater benefit from implemented changes in health policy.

	Private (n = 4,870)	Medicare (n = 4,743)	Medicaid (n = 40)	Other (n = 937)	Uninsured (n = 64)	P Value (Pearson Chi-square)
Pre-policy time period, 1994-1997						
Percent of patients who underwent PMBR	31.27%	3.58%	25.00%	29.03%	21.88%	(<0.001)
Adjusted OR (95% CI)	1.0	0.51 (0.39-0.68)	0.91 (0.39-2.13)	0.97 (0.82-1.15)	0.66 (0.34-1.27)	---
P value	---	<0.001	0.822	0.698	0.213	---
Post-policy time period, 2001-2004						
	Private (n = 7,613)	**Medicare** (n = 6,963)	**Medicaid** (n = 868)	**Other**[a] (n = 176)	**Uninsured** (n = 0)	**P Value** (Pearson Chi-square)
Percent of patients who underwent PMBR	47.64%	6.42%	21.43%	26.70%	n/a	(<0.001)
Adjusted OR (95% CI)	1.0	0.42 (0.34-0.48)	0.39 (0.32-0.63)	0.43 (0.29-0.64)	n/a	---
P Value	----	<0.001	<0.001	<0.001	n/a	---

[a]Hispanics, American Indians, Alaskan Natives, and patients of more than 1 race were combined into the Other category due to small sample sizes.

"Quickshot" Presentations

Saturday, May 5, 2012 (listed in order of presentation)

0270 Cryoablation Therapy for Early Breast Cancer

Eisuke Fukuma, Hirokazu Nakashima, MitsuhitoTozaki
Breast Center, Kameda Medical Center, Kamogawa, Chiba, Japan

Objectives: We have tried to induce nonsurgical cryoablation under image-guided manner as the local treatment for small breast cancer since 2006 and we report 5-year results of our experience.

Method: This study was approved by ethical committee. We used Visica I system provided by Sanarus .c.c. in USA. Cooling down driven with high-pressure argon gas form 4- x 4-cm ice ball maximum in size. Recently, we also performed cryoablation with IceSense3, supplied by IceCure c.c. in Israel. Indication of nonsurgical cryoablation is that tumor size is less than 10 mm, measured breast MRI, mammography, and ultrasonography (US). We have treated 38 patients with small breast cancer (mean diameter of lesions, 8.6 mm). US-guided cryoablation was carried out in 37 patients and MR-guided cryoablation was done in 1 patient. We exclude the patients with triple-negative breast cancer or HER2 type breast cancer. Postprocedural follow- up is scheduled with breast MRI and other imaging modalitie 3, 6, 12 months after the procedure with continued 6-month follow-ups. Three patients had vacuum-assisted biopsy to evaluate postprocedure imaging abnormalities. Patients had adjuvant radiation and systemic therapy according to their clinical and pathological finding.

Results: Median follow-up time is 26 months. Preoperative pathological examination revealed luminal A type breast cancer in 38 patients. No patient has had in-breast local recurrence or distant metastasis among those 38 patients. Particularly, 2 patients who had 2 breast cancers (multicentric breast cancer was surgically resected with endoscopic quadrantectomy, and ablated with Visica I) in 1 breast had breast conservative treatment with 2 local treatment methods.

Conclusion: It might be concluded that nonsurgical cryoablation would be alternative local treatment for the patient with small and favorable type breast cancer.

0058 Improved Tumor Bed Control with MammoSite® Accelerated Partial Breast Irradiation

Peter Beitsch[1], Frank Vicini[2], Pat Whitworth[3], Richard Fine[4], Vic Zannis[5], Henry Kuerer[6], Bruce Haffty[7], Maureen Lyden[8]
[1]Dallas Breast Center, Dallas, TX, USA, [2]21st Century Oncology, Detroit, MI, USA, [3]Nashville Breast Center, Nashville, TN, USA, [4]Advanced Breast Care, Marietta, GA, USA, [5]Breast Care Center of the Southwest, Phoenix, AZ, USA, [6]M. D. Anderson Cancer Center, Houston, TX, USA, [7]Robert Wood Johnson School of Medicine, New Brunswick, NJ, USA, [8]BioStat Incorporated, Tampa, FL, USA

Objectives: Randomized trials demonstrate that lumpectomy with whole-breast irradiation (WBI) yields survival equivalent to mastectomy. These trials also show that WBI has no impact on the ipsilateral appearance of new "elsewhere" cancers in quadrants away from the primary tumor quadrant. To date, all such trials report tumor bed recurrence rates higher than the rates of ipsilateral "elsewhere" cancers. We hypothesize that the focused radiation to the tumor bed of accelerated partial breast radiation (APBI) results in a tumor bed recurrence rate that is lower than the rate of "elsewhere" cancers, demonstrating that APBI controls the tumor bed better than WBI.

Method: One thousand four hundred forty patients (1449 cases) with early-stage breast cancer undergoing breast-conserving therapy were treated with the MammoSite® device to deliver accelerated partial breast irradiation (APBI) (34 Gy in 3.4 Gy fractions). One thousand two hundred fifty-five cases (87%) had invasive breast cancer (IBC) (median size = 10 mm) and 194 cases (13%) had DCIS (median size = 8 mm). Median follow-up was 60 months for all surviving patients.

Results: Fifty cases (3.5%) developed an ipsilateral breast tumor recurrence (IBTR). The 5-year actuarial rate of IBTR was 3.61% (3.65 % for IBC and 3.36 % for DCIS). Fourteen IBTRs (1.0%) were considered tumor bed failures and 36 (2.5%) elsewhere failures (72% of all IBTRs). There were no variables other than ER negativity ($p = 0.0004$) associated with IBTR, including patient age < 50 ($p = 0.8872$), close/positive margins ($p = 0.3756$), tumor size ($p = 0.7663$), or positive nodes ($p = 1.000$) in the invasive group. However, in the DCIS group both age <50 ($p = 0.0431$) and close/positive margins ($p = 0.0551$) were associated with increased IBTR.

Conclusions: Ipsilateral recurrence rate in patients treated with APBI using the MammoSite® device is very good and similar to that reported with whole-breast irradiation. However, unlike WBI, APBI had proportionally fewer tumor bed recurrences (presumably initial cancer recurrences) than elsewhere recurrences (presumably new primaries), which is contrary to WBI studies that have more tumor bed recurrences than ipsilateral elsewhere recurrences. This finding suggests that APBI with MammoSite® brachytherapy may be more efficacious at tumor bed control than WBI. However, phase III trials will be needed to validate this intriguing observation.

0064 Perioperative Antibiotic Use in Breast Surgery: Survey of The American Society of Breast Surgeons

Rushin Brahmbhatt, Tanya Hoskin, Jeffrey Scow, Judy Boughey, Ann Harris, Donna Goede, Marianne Huebner, James Jakub, Tina Hieken, Amy Degnim
Mayo Clinic, Rochester, MN, USA

Objectives: One quality measure included in The Joint Commission's Surgical Care Improvement Project (SCIP) is the discontinuation of perioperative antibiotics within 24 hours of surgery. The purpose of this study was to determine national practice patterns regarding surgeons' use of perioperative antibiotics for women undergoing breast operations requiring drainage tubes.

Methods: An anonymous survey was emailed to all members of The American Society of Breast Surgeons (ASBrS) in July 2011, with a reminder email 1 month later. The survey inquired about surgeon demographics and routine practices regarding use of perioperative antibiotics for breast operations requiring drains, with or without reconstruction.

Results: Of 2,857 ASBrS members contacted by email, 917 (32%) completed the survey and all self-identified as surgeons. Twelve surgeons not in active clinical practice were excluded from analysis. Of 905 evaluable respondents, most described themselves as general surgeons (46%) or breast surgeons (46%), in private practice (67%) or an academic/university setting (23%). The majority of surgeons (56%) reported performing 0-1 breast and axillary procedures per week that require drains, 40% reported 2-4 per week, and 4% reported 5 or more per week. For patients undergoing procedures when drain(s) are anticipated, most surgeons (86%) reported routine use of preoperative prophylactic antibiotics (defined as >90% of cases, or "always/almost always"), with 99% selecting a cephalosporin as their first choice for preoperative antibiotic.Patterns of postoperative antibiotic use beyond 24 hours showed variation depending on whether or not the procedure was combined with reconstruction. For nonreconstruction cases requiring drains, 76% (95% CI 73%-79%) reported "never/almost never" recommending antibiotics beyond 24 hours, while only 16% (95% CI 13%-18%) reported "always/almost always." In contrast, for immediate implant or tissue expander reconstruction cases, routine use of antibiotics beyond 24 hours was reported significantly more frequently (58%) compared to nonreconstruction cases (16%, $p < 0.001$). In cases of implant reconstruction, 83% of respondents reported the primary driver of the recommendation for postoperative prophylactic antibiotics was the plastic surgeon, and 14% reported both surgical teams were perceived as equal proponents. Among respondents who reported antibiotic use >24 hours, the duration recommended for nonreconstruction cases was "up to 1 week" in 38% and "until drains removed" in 39%, and this pattern of treatment duration was similar for reconstruction cases (33% for both answers).

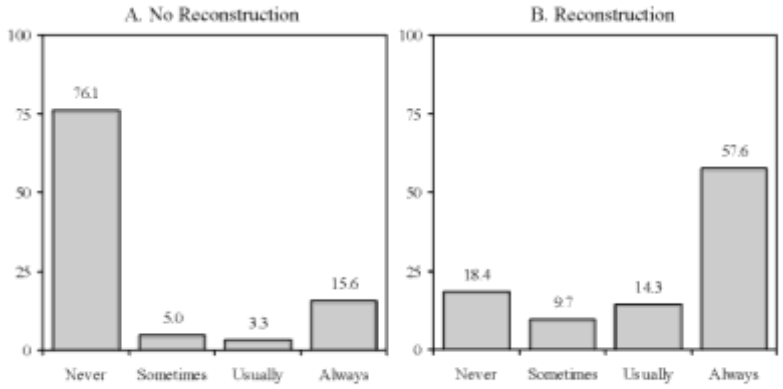


Figure 1: Responses regarding frequency of postoperative antibiotic prophylaxis beyond 24 hours, without (A) and with (B) reconstruction, expressed as percent of respondents.

Conclusions: For breast operations with drainage tubes, routine use of postoperative antibiotic prophylaxis beyond 24 hours is uncommon in the absence of breast reconstruction but is reported in the majority of cases when immediate implant reconstruction is performed. In these cases, plastic surgeons are perceived as the proponents of extended antibiotic prophylaxis, but length of prophylaxis is not uniform. These data demonstrate considerable variability in practice patterns and support the need for evidence-based investigation of the role of extended (>24 h) postoperative prophylactic antibiotics in breast surgery.

0167 Outcomes From Surgeon Performed Stereotactic Breast Biopsy: An Analysis of The American Society of Breast Surgeons Mastery of Breast Surgery Program

Marquita R Decker[1], Carrie A Thoms[2], Thomas A Gaskin III[3], Kambiz Dowlat[4], Edward J Clifford[5], Lee G Wilke[1]

[1]University of Wisconsin Hospitals & Clinics, Madison, WI, USA, [2]Prevea Health, Greenbay, WI, USA, [3]Princeton Surgical Specialists, Birmingham, AL, USA, [4]Rush University Medical Center, Chicago, IL, USA, [5]Surgical Group of North Texas, Irving,TX, USA

Objectives: The American Society of Breast Surgeons (ASBS) Mastery Program is a novel voluntary quality documentation initiative. This society provides accreditation for surgeons in stereotactic breast biopsy. The goal of this analysis was to evaluate the demographics, pathologic outcomes, and self-reported concordance rates for surgeon-performed stereotactic breast biopsy, as well as the relationship of these outcomes to ASBS stereotactic accreditation.

Method: Data on 4,339 stereotactic breast biopsies performed from 2006 to 2011 were reviewed from the ASBS de-identified database. Patient demographics, pathologic outcomes, complications, and self-reported concordance rates were analyzed. Rates were adjusted for proportion of missing data. Surgical outcomes and false-negative rates were calculated. Included were outcome comparisons between accredited and nonaccredited surgeons. Statistical analyses were performed using R: version 2.13.1.

Results: Ninety-eight surgeons performed stereotactic breast biopsies, 24% were ASBS certified and 76% did not report accreditation. Average patient age was 57.6 with 82% Caucasian and 9% African American. Seventy-six percent presented with mammographic calcifications without palpable mass; 90% were classified as BI-RADS 4. Biopsy pathology included: 51% benign masses, 36% fibrocystic changes, 7% atypia, 11% DCIS, and 12% invasive malignancy. Immediate complications occurred in 1.8% of patients. Significant increase in utilization of the program occurred in 2011. The data was divided into 2 subsets for outcome analyses: 2006-2010 (2235 biopsies: 11% missing pathology) and 2011 (2104 biopsies: 26% missing pathology). Concordance rates were 99% for each time period; false-negative rates were 0.3 and 0.1%, respectively. There were no significant differences in concordance rates for accredited vs nonaccredited surgeons (OR = 1.7; CI:0.7-4.4) 2006-2010; (OR = 0.8 CI:0.3-2.0) 2011.

Conclusions: The ASBS Mastery program provides a novel mechanism for surgeons to track and evaluate their outcomes. This analysis highlights the high utilization of this program by a select group of surgeons with excellent self-reported concordance, low complications, and false- negative rates with comparable pathologic outcomes to radiologic reported identification rates of malignancy.

0213 Identification of Breast Cancer Protein Biomarkers in Nipple Aspirate Fluid*

Adeline Deladisma[1], Erin Seeley[2], Lorraine Tafra[1], Darrel Ellsworth[3], Rachel Ellsworth[3], Kristen Sawyer[1], Charles Mylander[1], Barbara Urban[1]

[1]Anne Arundel Medical Center, Annapolis, MD, USA, [2]Vanderbilt University, Nashville, TN, USA, [3]Windber Research Institute, Windber, PA, USA

Objectives: Early breast cancers often remain undetectable on imaging and clinical exam. A noninvasive nipple aspirate (NINA) testing device can potentially be used to obtain nipple aspirate fluid (NAF) to evaluate cytologic atypia and breast cancer risk, particularly in women 25 to 65 years of age. The purposes of this study were to (1) identify NAF cytologic atypia and any proteomic differences using matrix-assisted laser desorption ionization time-of-flight (MALDI-TOF) mass spectrometry between 2 groups: women with invasive ductal carcinoma (IDCa) of the breast (cohort B) and an unaffected control cohort A of low-risk women and (2) compare characteristics of women with NAF yield vs women with no NAF yield.

Method: Eligible women underwent NINA testing [HALO^{TM} (Neomatrix)]. NAF from the cancer and noncancer groups were analyzed in 2 steps: cytologic evaluation of the cellular portion, followed by proteomic evaluation. Statistical analyses of the proteomic data were carried out using ClinProTools

Software (Bruker Daltonics). Characteristics of women who yielded NAF were compared to those who did not using chi-square analysis or Fisher exact test, p = 0.05.
Results: NINA testing was performed on 78 eligible subjects of which 40 (51.2%) expressed NAF to analyze (41% control cohort A and 69% cancer cohort B). Thirty-seven percent (29 of 78) of the enrolled women had IDCa (with 55% grade 3; mean size, 1.7 cm). No differences were detected in NAF cytology between the noncancer and cancer groups--all were benign, including NAF obtained ipsilateral to the breast cancer in women with IDCa. MALDI-TOF proteomic data indicate that the 2 cohorts can be distinguished via their NAF spectral profiles. Unsupervised hierarchical clustering resulted in 88.2% and 70% classifications accuracy for the noncancer and cancer cohorts, respectively. Receiver operator curves were generated for all of the peaks in the mass spectra. Four peaks had area under the curve (AUC) values of greater than 0.80; an additional 7 peaks had AUC values between 0.75-0.80. A support vector machine algorithm was generated which resulted in 91.9% recognition capability as well as 63.6% sensitivity and 79% specificity. Women with cancer were more likely to yield NAF (70.0% vs 46.9%, p = 0.045) as were women with an abnormal mammogram (70.6% vs 46.8%, p = 0.052). NAF yielders did not differ by age, race, menopausal status, HALO pain score, previous biopsy, history of nipple discharge, previous breastfeeding, fibrocystic disease, smoking, history of oral contraceptive use, or history of hormone replacement therapy.
Conclusions: Preliminary results are promising regarding the role of proteomic evaluation of NAF using MALDI-TOF to distinguish cancer cases from controls. Additional work is necessary to identify and validate unique protein signatures. Larger prospective trials will be needed to assess their predictive value in detecting breast cancer and to determine the patient groups in which this technology would have the greatest utility. Potential for improving NAF yield exists, which could result in greater predictive value in a broader population of women.
**Research funded in part by Dr Susan Love Research Foundation Pilot Grant Award.*

0140 Does the NSQIP Database Truly Reflect Breast Surgery Morbidities?
Dustin Eck, Ross Goldberg, Sanjay Bagaria, Stephanie Koonce, Tammeza Gibson, SP Bowers, Sarah McLaughlin
Mayo Clinic, Jacksonville, FL, USA
Objectives: The National Surgical Quality Improvement Program (NSQIP) database is a risk-adjusted data collection mechanism designed to help participating hospitals develop quality initiatives and improve surgical care. NSQIP captures the same variables for all surgical patients and calculates expected morbidity probabilities. Unfortunately, it applies uniform outcome measures of morbidity without regard to surgical site. We hypothesized that NSQIP may overestimate surgical morbidity after breast cancer operations.
Method: Using the 2008 NSQIP database, we identified 24,447 patients who underwent breast surgery of whom 8,941 had benign disease and 15,506 had breast cancer. We calculated the observed vs expected (O/E) morbidity ratios, keeping in mind that the ideal O/E ratio is less than 1. We compared O/E ratios amongst breast and other common general surgery procedures and further analyzed the O/E ratios between benign and malignant breast diagnoses.
Results: The O/E morbidity ratios demonstrate breast surgery as an outlier when compared with other common general surgery procedures (O/E ratios: breast surgery, 3.11; colon resection, 1.37; cholecystectomy, 0.76; inguinal hernia repair, 0.79). Focusing on breast surgeries, analysis of O/E morbidity according to benign or malignant breast diagnoses revealed an even higher O/E ratio for malignant patients (2.59 vs 3.22) citing reoperation within 30 days as the most common morbidity in both benign (61%) and malignant (76%) breast patients. Further analysis of the malignant patients by CPT code revealed mastectomy patients had an O/E ratio of 1.70 while breast conservation (BCS) patients had an O/E of 7.75, of which 89% of the BCS morbidity was due to reoperation. Among the 7236 BCS patients, 1027 (14%) required reoperation which is well within the acceptable benchmark rate of reoperation for re-excision of margins. Subtraction of the 30 day-reoperation variable from the calculation of morbidity in the malignant breast disease population would reduce the O/E morbidity ratio to 1.01 after all breast cancer operations and to 0.87 after BCS.
Conclusions: The O/E ratio is disproportionately high in breast surgery compared to other general surgery procedures secondary to high breast surgery reoperation rates. However, breast surgeons and patients expect and accept reoperation to clear positive margins, especially after BCS or to perform further axillary surgery. If future fee structures intend to use NSQIP data to determine reimbursement

eligibility, breast surgeons should advocate for more surgical site-specific metrics, as the quality assessment of high-volume breast centers will be negatively affected by the current NSQIP criteria.

0096 Cost Comparison of Radiation Treatment Options After Lumpectomy for Breast Cancer

Rachel Greenup, Melissa Camp, Alphonse Taghian, Julliette Buckley, Suzanne Coopey, Michele Gadd, Kevin Hughes, Michelle Specht, Barbara Smith
Massachusetts General Hospital, Boston, MA, USA

Objectives: Breast conservation therapy (BCT) for early-stage breast cancer includes lumpectomy followed by radiation therapy (XRT). With increasing constraints on health care resources in the United States, implementation of cost-effective treatment strategies is important. We sought to determine potential cost savings possible with use of established XRT regimens, including omission of radiation in women ≥70 years per CALGB 9343, use of accelerated external beam partial breast irradiation (APBI), and use of 4-week Canadian fractionation (CXRT) as alternatives to standard 6-week whole-breast radiation therapy (WBRT).

Method: We performed an IRB-approved retrospective review of a sample of 100 women who underwent lumpectomy for DCIS or invasive breast cancer at our institution during 2009. Eligibility for XRT regimens was based on published criteria as follows: CALGB 9343 for omission of radiation for women ≥70 yrs (T1N0, ER+); Canadian fractionation (≥50 yrs, T1 invasive ductal or lobular histology); and APBI ASTRO consensus statement "suitable" and "cautionary" candidates (age ≥50 years, no BRCA mutation, node-negative, ≤ 3 cm invasive ductal or lobular, DCIS or extensive intraductal component, unifocal disease). Margins ≥2 mm were required for all regimens. Average charges and CPT codes were used to calculate costs of radiation regimens based on the 2011 U.S. Medicare Fee Schedule. Treatment costs and potential cost-savings were modeled assuming that patients received the least expensive regimen for which they were eligible and that patients ineligible for lumpectomy without XRT, APBI, or CXRT defaulted to standard 6-week WBRT.

Results: Median patient age was 56.5 years old (range, 32-93 yrs). Tumor types included invasive ductal cancer (78%), DCIS (15%), invasive lobular cancer (6%), and mixed histology (1%). Median tumor size was 1 cm (range, 0.2-5cm). In this cohort, 14% were eligible for lumpectomy without XRT, 54% were eligible for APBI, 52% were eligible for CXRT, and 35% of women defaulted to standard WBRT. The average per-patient cost of radiation was $5341.81 for external beam-APBI, $10,274.18 for CXRT, and $13,358.37 for standard WBRT. When the most cost-effective XRT strategy was applied to our retrospective cohort, 14% received lumpectomy without XRT, 44% received APBI, 7% received CXRT, and 35% defaulted to WBRT. If these results were scaled up to a similar cohort of 1000 women, total radiation costs using this cost-effective strategy would be $7.75 million, compared with total costs of $13.36 million if all women received standard WBRT, a cost-savings of $5.61 million.

Standard vs Cost-Effective Radiation Treatment Strategy – 1000-patient model				
Radiation Regimen	**# of Eligible Pts**	**Cost per Patient**	**Total Costs This Regimen**	**Grand Total 1000 Patients**
Standard whole-breast radiation therapy				
Standard WBRT	1000 pts	$13,358.37	$13.36 million	$13.36 million
Cost-effective strategy				
Lumpectomy w/o radiation	140 pts	$0	$0	$7.75 million
APBI	440 pts	$5341.81	$2.35 million	
Canadian fractionation	70 pts	$10,274.18	$719,192.60	
WBRT	350 pts	$13,358.37	$4.68 million	
Cost-effective strategy applied to 1000 patients = $5.61 million saved				

Conclusions: When eligible breast cancer patients are offered the most cost-effective radiation treatment regimen for which they are eligible within current guidelines, a 42% reduction in radiation cost results.

0232 Is Surgeon's Perception of Margins During Segmentectomy for Breast Cancer Accurate?

Aimee Mackey[1], Sheldon Feldman[1], Mahmoud El-Tamer[2], Rossy Sandoval[1], Hanina Hibshoosh[1], Bret Taback[1]

[1]Columbia University Medical Center, New York, NY, USA, [2]Memorial Sloan-Kettering Cancer Center, New York, NY, USA

Objectives: Breast-conserving surgery (BCS) is the most frequently elected procedure by patients diagnosed with breast cancer. However, it is estimated that 20-40% of these patients will require additional surgery for positive margins on histopathologic assessment. To reduce re-excision rates, surgeons have employed different approaches, including intraoperative inking of margins, random or 6-margin cavity shavings, touch prep cytology, use of intraoperative imaging, and MarginProbe. As part of the multicenter prospective randomized trial using MarginProbe, intraoperative margin assessment was required by the participating surgeon. The purpose of this study was to evaluate the surgeon's perspective regarding margin positivity clinically prior to intraoperative randomization to the MarginProbe.

Method: Fifty-three patients diagnosed with nonpalpable unicentric breast cancer who elected BCS enrolled in this study. An initial roll-in of 3 patients was required for surgeons to gain experience with the study techniques. Conventional segmentectomy was performed followed by mandatory clinical assessment of the margin and intraoperative inking of the specimen with 6 colors for the corresponding margins. The surgeon was required to obtain additional shavings of the cavity where it was felt to be close or positive prior to intraoperative randomization. Final histopathologic margin assessment (superior, inferior, lateral, medial, anterior, and deep) was defined as close if the tumor was within 2 mm of the inked surface and positive if there were tumor cells abutting the inked surface.

Results: Among the 53 patients enrolled, 4 withdrew resulting in 49 patients. Thirty-three (67%) patients had invasive ductal carcinoma (IDC), 11 (23%) ductal carcinoma in situ (DCIS), and 5 (10%) invasive lobular carcinoma (ILC). Average age was 64 years (range, 42-87). Average size of the specimen was 5.6 cm (largest diameter), average volume 37.8 cm^3, and average weight 32.7 grams. Mean DCIS size was 1.4 cm. Mean invasive tumor size was 1.5 cm, of which 32 (82%) were T1 and 7 (18%) were T2. Overall, 16 (33%) of 49 primary segmentectomy specimens demonstrated 27 histopathologically positive margins. Forty-three patients were felt to have positive/close margins by the surgeon intraoperatively, resulting in an additional 134 shave margins (average, 3.1 shave margins/patient). Of these, 59 (44%) surgical shave margins correlated with a histopathologic positive/close margin in the primary specimen. Eight (30%) out the 27 positive margins did not correlate with surgeon perception. The most frequently predicted margin by the surgeon was inferior (57%). The most common histopathologic positive margins in the segmentectomy was deep (39%).

Conclusions: Our study demonstrates that surgeon perception is important in assessing margin positivity, however it is only accurate 44% of the time. Additionally, approximately 30% of positive margins were not suspected by the surgeon. Therefore, additional methods are needed to better predict and identify margin positivity at the time of initial operation which would reduce subsequent surgery. These findings suggest that relying on surgeon's intraoperative clinical assessment of margin status may be insufficient for assessing final pathologic margin status.

0251 Evaluation of Appropriate Short-Term Mammographic Surveillance in Patients Who Undergo Breast-Conserving Surgery

Sommer Gunia[1], Tricia Merrigan[2,3], Thomas Poulton[3], Eleftherios Mamounas[3]

[1]Affinity Medical Center, Massillon, OH, USA, [2]Akron General Medical Center, Akron, OH, USA, [3]Aultman Health Foundation, Canton, OH, USA

Objectives: Mammography is an important surveillance tool for detecting ipsilateral breast tumor recurrence (IBTR) after breast-conserving surgery (BCS). Although IBTR is an uncommon event in the first 2 years following surgery, various organizations have established protocols for postoperative mammographic surveillance. Currently there is no consensus on the optimal time interval for short-term imaging evaluation of patients following BCS.

Method: We conducted a retrospective chart and mammographic review of patients who underwent BCS at Aultman Hospital between 1/06 and 12/08. To be included in the study, patients had to be diagnosed with invasive primary breast carcinoma or ductal carcinoma in situ (DCIS), treated with BCS (with or without postoperative breast radiation), and have had at least 1 postoperative surveillance mammogram at the Aultman Breast Care Center. Our mammographic surveillance protocol for patients undergoing BCS consists of ipsilateral mammograms (affected side) around 6 and 18 months and bilateral

mammograms around 12 and 24 months. All mammogram reports were reviewed and all mammograms that were BI-RADS 0 or 4 were reviewed by a single radiologist (TBP).
Results: A total of 527 patients were identified who underwent BCS during the stated timeframe; 152 patients were excluded because they did not have any postoperative surveillance mammograms at the Aultman Breast Care Center, leaving 375 patients that constitute the core group for this study. Patient and tumor characteristics were as follows: median age at diagnosis: 63 years (range, 30-100); 67% were invasive ductal carcinomas, 26% were DCIS, and 6% were invasive lobular carcinomas. ER status was positive in 80%. PR status was positive in 63%. Of 280 patients with invasive cancer, HER2 status was available in 278 and was positive in 21%. Axillary nodes were positive in 26% of patients with invasive cancer. (Neo)adjuvant chemotherapy was used in 35%, hormonal therapy in 68%, and breast radiation in 91% of patients. Table 1 describes the findings from mammographic surveillance. Each additional mammographic screening (6 and 18 month mammograms) resulted in additional imaging in 3-4% of patients. There was a very low yield for identifying IBTR: 1/266 (0.4%) for the 5- to 10-month postoperative mammogram and 1/286 (0.3%) for the 16- to 21-month postoperative mammogram).
Conclusions: Based on our data and the low expected yield of IBTR in the first 2 years after BCS, it appears that annual mammographic surveillance would be adequate following BCS and that interval ipsilateral mammograms at 6 and 18 months do not provide additional clinical benefit.

Table 1

Type of Mammographic Surveillance	**5-10 Month Postoperative Mammogram**	**11-15 Month Postoperative Mammogram**	**16-21 Month Postoperative Mammogram**	**22-26 Month Postoperative Mammogram**
All Patients with Information	266 (71%)	319 (85%)	286 (76%)	272 (73%)
BI-RADS 1, 2 or 3	255	303	274	260
BI-RADS 0 or 4				
Affected breast	10	9	12	8
Contralateral breast	1	7	0	4
Additional Imaging	8	11	11	11
Additional Views	3	9	7	6
Ultrasound	5	2	3	2
MRI	0	0	1	3
Biopsy Performed	2	3	3	2
Pathology				
Benign	1	2	2	2
Malignant	1	1 (contra)	1	0

0237 Axillary Reverse Mapping for Breast Cancer: 5-Year Experience
Daniela Ochoa[1], Cristiano Boneti[1], Brian Badgwell[2], Soheila Korourian[3], Laura Adkins[1], Suzanne Klimberg[1,3]
[1]Division of Breast Surgical Oncology, Department of Surgery, University of Arkansas for Medical Sciences and the Winthrop P. Rockefeller Cancer Institute, Little Rock, AR, USA, [2]Division of Surgical Oncology, Department of Surgery, University of Arkansas for Medical Sciences and the Winthrop P. Rockefeller Cancer Institute, Little Rock, AR, USA, [3]Department of Pathology, University of Arkansas for Medical Sciences, Little Rock, AR, USA
Objectives: Variations in arm lymphatic drainage put the arm lymphatics at risk for disruption during axillary lymph node surgery. We hypothesize that mapping the drainage of the arm with blue dye (axillary reverse mapping, ARM) decreases the likelihood of disruption of lymphatics and subsequent lymphedema.
Method: This institutional review board (IRB)-approved study from May 2006 to October 2011 involved patients undergoing SLNB and/or ALND. Technetium sulfur colloid (4 mL) was injected in the subareolar plexus and 5 mL of blue dye subcutaneously was injected in the volar surface ipsilateral upper extremity (ARM). Data were collected on variations in lymphatic drainage that impacted SLNB or ALND, successful identification and protection of the arm lymphatics, any crossover between a hot breast node and a blue arm node, and occurrence of lymphedema.

Results: A group of 385 patients underwent a total of 396 procedures for breast cancer. Their average age was 56 years old. A total of 382 patients underwent an SLNB. Of those, 266/382 (69.6%) had an SLNB only and 116/382 (30.4%) went on to an ALND due to a positive axilla. An additional 14/396 (3.5%) axilla had ALND due to a clinically positive axilla/preoperative CNB. In 95.5% (365/382) of patients with SLNB, breast SLNs were hot but not blue. Crossover (SLN hot and blue) was seen in 17/382 (4.5%) SLN procedures. Blue lymphatics were identified in 92/266 (35%) of sentinel lymph node incisions and in 98/130 (75%) ALND. Of the resected ARM nodes, 16.7% (5/30) contained tumor, 2 cases due to crossover and 3 cases in heavily positive axilla (N2 and N3). Average follow-up was 18 months (range, 6 to 48 months). Preservation of the blue lymphatics resulted in a SLNB lymphedema rate was 4.9% (4/80) and ALND of 8.9% (7/79).
Conclusions: ARM identified significant lymphatic variations draining the upper extremities and facilitated preservation. Metastases in ARM-identified lymph nodes was acceptably low indicating that ARM is safe. ARM added to present-day ALND and SLNB further defines the axilla and may be useful to prevent lymphedema.

Posters

(in alphabetical order by first author)

0246 Comparison of Lesion Size Between Preoperative Imaging and Postoperative Histopathology in Unifocal Breast Cancer

Christa Abraham, Beth Whiteside, Michael Schuster, David Jones, Jesse Pollard, Lindsey MacFarlan, Katheen Hena, Muhammad Hena
Albany Medical Center, Albany, NY, USA

Objectives: Patients with biopsy-proven stage I and stage II breast cancer usually undergo preoperative magnetic resonance imaging (MRI) and/or ultrasound to delineate the margins of the lesion to be removed, to determine multicentric disease as well as evaluate the contralateral breast. The purpose of this study was to compare the findings of the 2 imaging modalities with the postoperative histopathology.
Method: The charts, images, and pathology specimens of breast cancer patients treated in our surgical oncology clinic between 2007 and 2010 were retrospectively reviewed. The Stage I and II patients with unifocal disease had both an ultrasound and MRI examination of the breast as part of their preoperative assessment. The estimated size of the lesion from preoperative imaging was compared to the actual size measured microscopically in the pathology specimens.
Results: Of 171 women with breast cancer treated during the study period, 24 consecutive patients had biopsy-proven stage I or II unifocal disease. Compared to the sizes of the lesions on histopathology, there was better correlation with ultrasound than MRI. For lesions <2 cm, both modalities overestimated the size of the lesion; for lesions >2 cm both MRI and ultrasound underestimated the size of the lesion. A regression analysis was done. The regression equation is: US size (cm) = 0.339 + 0.710 T path size, and (R^2 = 68%) for ultrasound. For MRI, the regression equation is MRI size (cm) = 0.641 + 0.636 T path size, and (R^2 = 43%) for MRI.
Conclusions: From these data we conclude that (1) ultrasound is the single most useful examination for preoperative estimation of lesion size in stage I and II unifocal breast cancer, and (2) surgeons performing breast conservation techniques for such patients should expect to remove a larger amount of tissue than suggested by preoperative images for lesions over 2 cm.

0059 Vitamin B Complex + E: Additional Treatment for Women With Benign Breast Pain

Christine Joy J Aguirre-Trespeces, Rufino Oro
Iloilo Doctors' Hospital, Iloilo City, The Philippines

Objectives: This study was conducted to evaluate the effectiveness of combined vitamin B complex plus vitamin E in relieving benign tolerable breast pain.
Method: This is a prospective randomized controlled study that included all female service patients ages 15-60 years old with tolerable breast pain who consulted at the Iloilo Doctors' Hospital outpatient department service (IDH-OPD service) from the period of January 2005 to May 2009. A total of 208 patients were included in the study, divided into 2 distinct groups using the odd-even scheme. The first group (control) were those patients who received the recommended standard treatment of supportive counseling, education, and self-care measures. The second group (experimental) were those patients receiving the standard treatment recommendation plus vitamin B complex plus Vitamin E taken I tablet per day for 1 month. Then, re-evaluation of the each patient in both groups was done at the OPD service. The severity of the breast pain was evaluated using the numerical pain scale, comparing the initial pain score and 1 month after on both control and experimental group.
Results: There were 126 (60.6%) female patients with breast pain in the treatment group and 82 (39.2%) female patients belonging to the control group. In the treatment group, there were 114 (90.5%) patients who were painfree after a month of daily intake of the Vitamin B complex+ Vitamin E and only 12 (9.5%) patients demonstrated persistent breast pain. For the control group, there were 8 (9.8%) patients who were painfree and 74 (90.2%) patients complaining of persistent breast pain. The study was subjected to chi-square test which showed that Vitamin B complex plus Vitamin E is effective in relieving tolerable benign breast pain.
Conclusions: Vitamin B complex plus vitamin E tablet can be an alternative in the treatment of tolerable benign breast pain.

0265 Intraoperative Digital Specimen Radiography of Sentinel Lymph Nodes As An Alternative to Frozen Section Diagnosis for Breast Cancer Axillary Staging

Rahim Aimaq[1], James Recabaren[1,2]
[1]Huntington Hospital, Pasadena, CA, USA, [2]USC Keck School of Medicine, Los Angeles, CA, USA

Objectives: Sentinel lymph node/nodes (SLN) biopsy is an accepted technique for determining axillary lymph nodal status. SLN status is frequently determined by frozen section for surgical treatment planning prior to final histopathology. Previous studies have shown that breast cancer metastasis macroscopically alters axillary lymph node architecture. These anatomic changes have also been used to develop ultrasound criteria to predict axillary nodal status. Our goal was to apply these parameters to digital specimen radiography and use intraoperative imaging criteria to predict SLN status. We proposed this study as a noninferiority trial in comparison to frozen section, with final histopathology as the control.

Method: After institutional review board (IRB) approval, the Bioptics, piXarray 100, digital specimen radiography system was used to intraoperatively image the SLN of 30 consecutive women. This was performed prior to delivery of the SLN to the pathology suite. The digital specimen radiography interpretation was then compared to final histopathology. For each SLN imaged, the following 3 data points were defined and recorded: size (long axis in cm), shape (short axis to long axis ratio), and texture (cortical thickness to diameter ratio). A histologic blinded 1, 2, or 3-point score was then assigned to each of the 3 parameters with the calculation of an overall mean and standard deviation. A total image score of 3 to 9 points was possible for each SLN. The Mann-Whitney U Test was used to calculate statistical significance.

Results: Thirty consecutive clinically node-negative patients' SLN specimens were imaged. All women had a biopsy-proven preoperative diagnosis of breast cancer. This cohort of 30 patients yielded 35 retrieved SLN. Four of 35 (11.4%) SLN contained breast cancer metastasis on final H&E pathology. An additional 2/35 (5.7%) SLN were IHC positive for micrometastasis. By SLN imaging parameters, both shape and texture were different, with statistical significance ($p \leq 0.026$, 0.043), when compared to H&E histopathologic nodal diagnosis. All 3 parameters became statistically significant when IHC-diagnosed micrometastasis was included ($p \leq 0.033$, 0.051, 0.032). Subsequently a histologic blinded assignment of total points for each of the 3 combined imaging parameters was calculated for each SLN. An image score of ≥7 had a 100% sensitivity for predicting SLN metastasis vs a 75% sensitivity by frozen section evaluation, when both were compared to only permanent H&E histopathology. When micrometastasis were added to the overall analysis, the sensitivity of the SLN image score remained at 100%, while sensitivity dropped to 50% for frozen section interpretation.

Conclusions: Intraoperative digital specimen radiography of SLN is noninferior to conventional frozen-section techniques in predicting real-time axillary lymph node status. Additionally, it can be used as an adjunct to predict micrometastasis. We propose using this reproducible digital specimen radiography evaluation system to successfully predict SLN status in an intraoperative environment.

0025 Breast Lesion Excision System for Diagnosis of Suspicious Nonpalpable Breast Lesions: Does Thermal Tissue Damage Affect Diagnosis and Outcome?

Wasim Al-harethee[1], Ioannis Papapanagiotou[1], Maria Matiatou[1], Vasileios Kalles[1], Georgia Georgeiou[1], Afroditi Nonni[2], Paraskevi Liakou[1], Andreas Manouras[1], George Theodoropoulos[1], George C Zografos[1]
[1]Breast Unit, 1st Department of Propaedeutic Surgery, Hippokratio Hospital, School of Medicine, University of Athens, Athens,Greece,[2]School of Medicine, University of Athens, Department of Pathology, Athens,Greece

Objectives: The stereotactic vacuum-assisted breast biopsy is currently recommended as the initial diagnostic procedure for suspicious, nonpalpable mammographic lesions. The Breast Lesion Excision System® (BLES) is an image-guided percutaneous biopsy device that utilizes radiofrequency in order to retrieve an intact, suspicious, nonpalpable breast tissue specimen for pathologic diagnosis. An acceptable size of thermal artifact varies between 0.1 mm and 1 mm. The purpose of this study is to determine the effects of radiofrequency on the specimen tissue analysis due to thermal damage.

Method: This prospective clinical study included 226 consecutive patients with suspicious, non-palpable mammographic lesions (BI-RADS ≥ 4) that underwent 234 stereotactic, vacuum- assisted breast biopsy procedures from June 2008 to December 2010 at Breast Unit, Hippocrateion Hospital of Athens with the use of BLES. Inclusion criteria consisted of suspicious breast lesions, and, in particular, microcalcification, solid lesions, and radial scars. In order to retrieve an intact biopsy specimen, a 12-mm, 15-mm, or 20-mm

tissue basket was used, depending on the size of the lesion. The biopsy in all cases was performed under local anesthesia by the same team. According to the pathology report, we classified thermal damage in 3 categories: severe (recognition of malignant cells but inability to make definite diagnosis due to thermal damage), medium (ability to make diagnosis but either circumferential thermal damage >2 mm or diffuse areas of thermal damage), and mild (circumferential thermal damage 1-2 mm). The follow-up period for all patients was 6 months.
Results: The procedure was considered successful in all cases with mammographic (specimen and patient) confirmation of proper excision. In 3 cases the basket initially failed to deploy and a second basket had to be utilized in order to complete the biopsy. Thermal damage of the specimen occurred in 12 cases (3.59%). The damage was severe in 4 specimens (3 benign, 1 IDC), medium in 4 specimens (4 benign), and mild in 4 specimens (3 benign, 1 IDC). Among the patients with severe specimen damage, those with benign lesions were followed up at 6 months, and the patient with IDC received appropriate surgical treatment. Among the patients with medium specimen damage, those with benign lesions were typically followed up at 6 months. The patients with mild thermal damage and benign diagnosis were also followed up at 6 months, and the patient with IDC received appropriate surgical treatment.
Conclusions: In summary, although thermal damage is of concern during breast biopsy with the use of BLES, the incidence is very low. Even severe cases of thermal damage do not seem to affect the outcome of the pathology report. When medium or severe thermal damage occurs, patients with lesions diagnosed as benign should be followed up closely, although repeating the biopsy with alternative methods (e.g., open biopsy) should also be considered, in case of any clinical suspicion.

0183 Is Sentinel Lymph Node Biopsy Accurate After Neoadjuvant Chemotherapy in Patients Who Present With Node-Positive Breast Cancer?
Rosalinda Alvarado, Min Yi, Huong Le-Petross, Michael Gilcrease, Elizabeth Mittendorf, Isabelle Bedrosian, Funda Meric-Bernstam, Rosa Hwang, Abigail Caudle, Jeri Akins, Henry Kuerer, Kelly Hunt
M.D. Anderson Cancer Center, Houston, TX, USA
Objectives: Standard treatment for breast cancer patients with confirmed axillary lymph node metastasis at presentation includes a complete axillary lymph node dissection (ALND) at the time of surgery. Sentinel lymph node (SLN) biopsy has been investigated in this patient population after neoadjuvant chemotherapy and has shown mixed results. The objective of this study was to evaluate SLN biopsy in this setting and to determine if post-treatment ultrasound could select appropriate patients for this technique.
Method: Between 1994 and 2010, 150 patients who had axillary metastasis identified by ultrasound-guided, fine-needle aspiration underwent SLN biopsy after neoadjuvant chemotherapy as part of a single-institution study. Of these, 121 underwent completion axillary lymph node dissection (ALND). Clinical and pathologic characteristics of these patients were analyzed both pre-treatment and after chemotherapy. Ultrasound of the regional nodes was performed at diagnosis and prior to surgery in all 150 patients. Statistical analyses included Fisher exact test for analysis of lymph node response and multivariate logistic regression for factors associated with a false-negative event.
Results: The median patient age was 52 years, and the median primary tumor size at presentation was 2 cm. Thirty-nine (26%) of 150 patients had a pathologic complete response (pCR) in the breast and 63 (42%) had a pCR in the lymph nodes. The SLN identification rate was 93% (139/150). Of the 150 patients, 121 underwent ALND, including 10 patients who did not have an SLN identified. In the 111 patients in whom a SLN was identified and ALND performed, 15 patients had a false-negative SLN (21%). Multivariate logistic regression showed that smaller tumor size at presentation and fewer SLNs removed (<2) at surgery were associated with having a false-negative SLN. At presentation, 25 (17%) of the total 150 patients had indeterminate-appearing lymph nodes on axillary ultrasound and 125 (83%) had either suspicious or malignant-appearing lymph nodes. After chemotherapy, 75 (50%) had normal-appearing lymph nodes. Morphology of the lymph nodes on ultrasound after chemotherapy correlated with final pathology. Of the normalized nodes on ultrasound, 38 (51%) of 75 had a pCR and of those with persistent suspicious or malignant-appearing nodes on ultrasound only 25 (33%) of 75 had a pCR in the nodes ($p = 0.047$).
Conclusions: In breast cancer patients with documented axillary metastases who undergo neoadjuvant chemotherapy, approximately 40% will have a pCR in the nodes. Normalization of the morphology of axillary nodes on ultrasound correlates with a higher rate of pCR in the nodes. SLN biopsy is associated with a false-negative rate of approximately 20% in patients who have residual disease in the axilla.

Removing fewer than 2 SLNs at surgery is associated with a false-negative event. Careful attention to removing all SLNs at surgery may reduce the false-negative rate in this patient population.

0022 Modified Surgical Technique Using a Urinary Catheter Balloon As Cavity Evaluation Device for Accelerated Partial Breast Irradiation

Heidi Apsey, Richard Gray, Nabil Wasif, William Wong, Sujay Vora, Michele Halyard, Barbara Pockaj
Mayo Clinic, Phoenix, AZ, USA

Objectives: Intraoperative use of a cavity evaluation device (CED) facilitates subsequent placement of the brachytherapy catheter for partial breast irradiation (PBI). A modified technique using a urinary catheter balloon was compared with the standard CED.

Method: A retrospective analysis of patients undergoing accelerated partial breast irradiation (APBI) using balloon-catheter brachytherapy. At the time of segmental mastectomy, the lumpectomy cavity was evaluated by temporarily placing the commercially available CED or a 75-ml urinary catheter balloon (Bardex®) through a separate stab wound and tunneled to the lumpectomy cavity. The superficial subcutaneous layer was closed over the balloon. The balloon was filled with normal saline and evaluated by intraoperative ultrasound for adequate volume, dimensions, and skin spacing. The balloon was then deflated, removed from the breast and incisions closed. The patient would return as an outpatient for brachytherapy catheter placement once final pathology became available. The stab wound entry and tunnel created intraoperatively were used to place the balloon-catheter under ultrasound guidance. Oral antibiotics (Cephalexin 250 mg PO qid) were started 24 hours prior to catheter placement and continued during course of APBI.

Results: Forty-eight patients were eligible for APBI based on tumor characteristics. Three patients were excluded from getting APBI due to inadequate skin spacing. One patient was excluded when conformity of the lumpectomy cavity to the CED could not be achieved intraoperatively. Of the remaining 44 patients who were evaluated for brachytherapy balloon-catheter placement, the mean age was 66 years (range, 44-82). Tumor histology included 31 (70%) invasive ductal carcinomas, 2 (5%) invasive lobular carcinomas, 2 (5%) mixed invasive ductal and lobular carcinomas, 1 (2%) mucinous carcinoma, and 8 (19%) ductal carcinomas in situ. The mean tumor size was 1.0 cm (range, <0.2 cm-3.2 cm). Mean negative margin width was 0.5 cm (range, 0.2 cm-1.4 cm). MammoSite® balloon-catheters were used in 19 (43%) patients and Contura® balloon-catheters were used in 24 (54%) patients. Intraoperative cavity evaluation with a device occurred in 42 (95%) patients. The manufacturer's CED was utilized in 19 (43%) and the urinary catheter balloon in 24 (54%) patients. The size of the final brachytherapy balloon ranged from 35 to 100 ml (mean, 44 ml). Overall, 41 patients (93%) completed APBI. Total infection rate among patients who underwent cavity evaluation with a device was 4 (9%): 4.5% among manufacturer CED patients and 4.5% among the urinary catheter CED patients. One infection occurred in a manufacturer CED patient prior to brachytherapy catheter placement. The other 3 infections occurred while undergoing brachytherapy with PBI being aborted in 2 of these patients. The commercially available CED was found to cost $148.00 while the urinary catheter CED cost $12.68.

Conclusions: Intraoperative cavity evaluation utilizing a urinary catheter balloon facilitates post-operative brachytherapy balloon-catheter placement. The cost is significantly less compared to the commercially available CED, while the rates of ineligibility for APBI and rates of infection do not appear to be increased. We recommend the urinary catheter balloon as a cost-effective alternative for brachytherapy cavity evaluation.

0060 An Innovation in Breast Cancer Care: The Evaluation and Validation of a Rapid Diagnostic and Support Clinic for Women Assessment for Breast Cancer

Angel Arnaout, Jean Seely, Susan Robertson, Jennifer Smylie, Kathy Knight, Shilpa Lad, Watters Jim
Ottawa Hospital, Ottawa, ON, Canada

Objectives: The diagnostic phase of care is an extremely anxiety-provoking and stressful experience for the potential breast cancer patient and her family. Early detection and treatment are the best options for improving outcomes in breast cancer. A multidisciplinary team of breast cancer specialists in a regional referral center embarked on a new initiative to improve breast care by setting up a *Rapid Diagnosis and Support (RADS) Clinic* to coordinate the diagnostic imaging workup, needle biopsy, and pathological diagnosis for women with suspicious initial diagnostic mammogram findings. A prospective study was performed to evaluate the effectiveness this innovative service delivery model aimed at wait times, decreasing the fragmentation of care and enhancing a patient's overall breast care experience.

Method: Consecutive patients with initial diagnostic mammograms classified as BI-RADS 5 were invited to participate in the study. Interventions in the model included prioritizing biopsy appointments, initiating follow-up diagnostic imaging, providing support and coordination of care by a nurse navigator. Wait times (measured in business days) were evaluated at 3 different intervals: from (a) diagnostic imaging to biopsy, (b) biopsy to pathology report verification, and (c) diagnostic imaging to MRI. Patient satisfaction surveys were completed. All data postintervention were compared to historical data at our breast center. Statistical analysis was performed with paired and Wilcoxon *t* test analysis.
Results: A total of 88 BI-RADS 5 patients consented to the study between March and Sept 2011. Eighty-two (93%) patients had either invasive carcinoma or DCIS that necessitated surgery. All wait times significantly improved after initiation of the RADS Clinic. Biopsy wait times improved from a mean of 6 to 2 days ($p < 0.0001$); pathology verification from 4 to 3 days ($p = 0.03$); and MRI wait times from 9 to 7 days ($p = 0.017$). Eighty-five (97%) patients rated the care and support they received from RADS clinic as "excellent" or "very good," and 97% of patients felt completely satisfied that they were cared for in a timely manner.
Conclusions: The Rapid Access and Diagnostic Clinic significantly improved diagnostic wait times and overall experience for patients with a highly probable diagnosis of breast cancer and can serve as an innovative service delivery model for other breast care centers.

0166 Metabotropic Glutamate Receptor-1 Is Oncogenic in Triple-Negative Breast Cancer
Malathi Banda[1,2], Cecilia Speyer[1,2], David Gorski[1,2]
[1]*Wayne State University School of Medicine, Detroit, MI, USA,* [2]*Barbara Ann Karmanos Cancer Institute, Detroit, MI, USA*
Objectives: L-glutamate is the major excitatory neurotransmitter in the central nervous system and activates both ionotropic and metabotropic glutamate receptors. Metabotropic glutamate receptors (mGluRs) represent a family of G protein-coupled receptors that have been divided into 3 groups on the basis of sequence homology, putative signal transduction mechanisms, and pharmacologic properties. mGluR1 (gene: GRM1) has been shown to activate phosphatidylinositol-calcium second messenger systems, and aberrant extracellular glutamate signaling has been implicated in carcinogenesis, specifically in melanocytes, where GRM1 expression plays a critical role in the development of melanoma. Previously in our laboratory, we detected mGRM1 expression in triple-negative breast cancer cells and therefore hypothesized that GRM1 could be an oncogene in TNBC. To test this hypothesis, we evaluated the role of mGluR1 in regulating the phenotype of premalignant mammary epithelial cells.
Method: We studied the role of mGluR1 in TNBC progression using the MCF-10 series of cell lines, which are all triple negative. These cell lines represent progression from normal mammary epithelium (MCF10A) to atypical hyperplasia (MCF10AT1) to ductal carcinoma in situ (MCF10.DCIS.com) and to fully malignant TNBC (MCF10.CA1D). GRM1 was overexpressed in the normal and premalignant cell lines in the progression series cells, (MCF10A and MCF10AT1) and silenced using shRNA in the malignant cell lines in the series (MCF10.DCIS.com and MCF10.CA1D). We then determined whether mGRM1 has a transforming role through in vitro studies of proliferation, invasion, migration, and anchorage-independent growth. We also inhibited mGluR1 signaling using 2 pharmacologic inhibitors: Riluzole, which is FDA-approved for amyotropic lateral sclerosis, and BAY-7620, which is a specific noncompetitive inhibitor of mGluR1. Effects were evaluated on proliferation and anchorage-independent growth. Finally, MCF10AT1 cells were transduced with a lentiviral construct driving mGluR1 expression and injected into athymic nude mice. The growth and histology of the resultant xenografts were compared with cells transduced with a LacZ control.
Results: mGluR1 overexpression increased proliferation, anchorage-independent growth, and invasiveness in MCF10AT1 and not in MCF10A cells, while knockdown of mGluR1 expression resulted in a decrease in proliferation, anchorage-independent growth and invasiveness in MCF10.CA1D cells. Pharmacologic inhibition of mGluR1 signaling in MCF10.CA1D cells resulted in a decrease in proliferation and anchorage independent growth. Transduction of MCF10AT1 cells with GRM1 resulted in transformation to carcinoma in 8/10 of the resultant xenografts compared to 2/10 for wild type and 3/10 for LacZ controls.
Conclusions: mGluR1 expression and activity increases cell proliferation, anchorage independent growth, and invasion in vitro. In vivo, mGluR1 drives progression of MCF10AT1 cells from hyperplastic lesions to frank carcinoma. We therefore conclude that mGRM1 plays a role of an oncogene in the progression of TNBC and represents a potential new therapeutic target in TNBC.

0103 Radioactive Counts and Sentinel Node Positivity in Breast Cancer Patients: A Single Surgeon's Longitudinal Experience

Daniel Barnas[1], Aaron Bleznak[2]
[1]*Lehigh Valley Health Network, Allentown, PA, USA,* [2]*Sentara Healthcare and Eastern Virginia Medical School, Virginia Beach, VA, USA*

Objectives: Pathologic nodal staging employing the technique of lymphatic mapping and sentinel lymph node (SLN) biopsy has become the standard of care for patients with invasive breast cancer. Most surgeons utilize a radioactive tracer, alone or in conjunction with a vital blue dye, to identify the pertinent nodes. The literature suggests that all nodes which have gamma counts ≥10 times the background count and all blue-stained nodes should be removed. Some reviews of large institutional databases describe a low false-negative rate with removing a limited number of SLNs. At our institution we attempted to determine the degree to which the SLN counts correlate to the presence of metastasis and if we could identify an optimal number of SLNs to remove to minimize both the false-negative rate and the number of nodes retrieved.

Method: We performed a retrospective review of a prospectively maintained database, which chronicled a single surgeon's breast cancer SLN biopsy experience from 1997-2011. Eight hundred twenty-three SLN procedures were attempted and 153 patients (19%) met the inclusion criteria of at least 1 positive SLN and 1 negative SLN and mapping performed by radioactive counts. We then correlated the SLN radioactive counts and the pathology for each patient.

Results: Of all 153 patients who qualified for the study, the node with the highest count was positive for metastatic disease in 105 (68.6%) and the 2 nodes with the highest counts identified 140 (91.5%) node-positive patients. The study cohort from the final 2 years (2009-2011) had the metastasis identified in the most radioactive node 81% (26/32) of the time. The difference is statistically significant (Table 1).

Table 1

Time Frame	**Metastases in Most Radioactive Node**	**Metastases in 2 Most Radioactive Nodes**
1997-2008	79/121 (65%)	110/121 (91%)
2009-2011	26/32 (81%)	30/32 (93%)
Chi square	p = 0.000104	p = not significant

Conclusions: From a prospectively collected database of 823 consecutive sentinel node biopsies for breast cancer, we isolated a subset of node-positive patients who had at least 1 negative SLN and demonstrated that removing only the most radioactive node would have understaged almost one third (31%) of patients, while removing the 2 most radioactive nodes understaged 8%. These data, from a single surgeon, are concordant with previously published findings from larger databases documenting the experiences of multiple surgeons. For reasons that are unclear, there is a statistically significant improvement of sensitivity in finding metastases in the most radioactive SLN seen with increasing experience; the biologic rationale for this is unclear and the false-negative rate would still prove unacceptable. Our data does not support limiting the number of radioactive nodes a surgeon removes. For maximum accuracy, we will continue to remove all nodes with radioactive counts greater than 10% of the hottest node. This is increasingly important given the trend toward eliminating intraoperative nodal assessment for metastases.

0093 A Study of the Impact of Magnetic Resonance Imaging in Newly Diagnosed Breast Cancer Patients: A Community Hospital Experience

Thomas Bauer, Ronald Hempling, Rodney Grim, Joanne Trapeni
Wellspan Health, York, PA, USA

Objectives: The objectives of this study were to determine the frequency with which magnetic resonance imaging (MRI) alters the anticipated plan of care in newly diagnosed breast cancer patients, and the impact of MRI on the rate of re-excision to achieve tumor-free margins among patients who underwent breast-conserving surgery.

Method: The medical records of 419 consecutive patients diagnosed with breast cancer referred for MRI were reviewed. Lack of insurance, patient refusal, metallic implants, claustrophobia, arthritis, and obesity reduced the number of evaluable patients to 318 (75.9%).

All MRI studies were reviewed by 1 of 4 subspeciality trained radiologists in an American College of Radiology accredited community hospital facility which is also designated a *Breast Center of Excellence.*

Patients whose MRI studies indicated the need for biopsy had these procedures performed by the above-noted radiologists or the referring surgeon. The medical records of each participant in the study cohort were reviewed and a determination was made as to the affect of MRI on interdisciplinary treatment planning. Z tests were used to determine statistical significance in the difference of lesion size in, re-excision rates, and mastectomy rates.
Results: One hundred forty-nine of 318 MRI patients (46.85%) were found to have abnormalities that warranted biopsy. Biopsy results among 99/149 (66.4%) patients demonstrated malignancy, while the results of biopsies in the remaining 50 patients (33.6%) were negative. Among the 99 patients whose MRI-detected lesions demonstrated malignancy on biopsy, 70 patients (71%) were found to have multifocal (47.9%) or multicentric disease (52.1%), 15 patients (15%) were found to have disease in the contralateral breast, and 14 patients were found to have ipsilateral axillary nodal metastasis. Ninety-nine patients of the entire study cohort of 318 patients (31%) were found to have an abnormality diagnosed by MRI which altered the patient's planned therapy. Mean tumor size as determined by MRI ranged from 2.1 to 2.9 cm. Year-to-year comparison of size failed to achieve statistical significance. Despite the similarity in mean lesion size, the rate of re-excision for positive margins declined throughout the period of the study. In addition to being clinically important, this difference achieved statistical significance when the rate in 2003 (33%) was compared to that in 2008 (5%), and maintained statistical significance when compared to the rates observed in 2010 (20%) and 2011 (11.1%). The overall reexcision rate among patients who had MRI was 10.2% compared to 22, 8% among patients who did not undergo MRI ($P = 0.003$)**.** Fifteen percent of 318 patients who underwent MRI underwent mastectomy, compared to 35% of 101 patients who did not undergo MRI ($P < 0.0001$).
Conclusions: Preoperative MRI can be a useful tool in interdisciplinary treatment planning for newly diagnosed breast cancer patients and may be associated with a significant reduction in the need for margin-positive mandated re-excision in patients who undergo breast-conserving surgery. Further study of the role of MRI in the routine management of patients with breast cancer appears warranted.

0190 MammaPrint 70-Gene Assay Predicts Risk of Local-Regional Recurrence
Peter Beitsch[1], Arthur Jia[2], Femke de Snoo[3], Pat Whitworth[4], Rakesh Patel[5], Emiel Rutgers[6], Caroline Drukker[6]
[1]Dallas Breast Center, Dallas, TX, USA, [2]Agendia, Department of Product Support, Irvine, CA, USA, [3]Agendia, Department of Medical Affairs, Amsterdam, Holland, The Netherlands, [4]Nashville Breast Center, Nashville, TN, USA, [5]Western Radiation Oncology, Mountain View, CA, USA, [6]Netherlands Cancer Institute, Department of Surgical Oncology, Amsterdam, Holland, The Netherlands
Objectives: Breast cancer systemic treatment is moving into an era of personalized targeted therapy based on individual tumor characteristics, including genomics and gene expression. To avoid over- or under-treatment, local-regional treatment should be similarly targeted based in individual tumor/host characteristics. The MammaPrint 70-gene assay defines high- and low- risk groups that have a ~30% and 10% risk of 10-year distant recurrence risk prior to adjuvant treatment. We hypothesize that the MammaPrint 70-gene assay is predictive of local-regional recurrence in early-stage breast cancer patients undergoing breast conservation therapy.
Method: From a database of 1534 breast cancer patients with a median follow-up of 7.2 years, we analyzed the local-regional recurrence rate of a group of 594 node-negative patients who had breast-conserving therapy. All patients had negative margins and received postlumpectomy radiation, 170 received adjuvant chemotherapy, and 165 patients with ER+ cancers received adjuvant hormonal therapy. The patients were prospectively followed and clinical outcomes, including distant recurrence, survival, and local-regional recurrence, were recorded. Known risk factors at the time of diagnosis for local regional recurrence, including tumor size, ER status, Her2 status, and grade, were included in our analysis, in addition to the MammaPrint 70-gene analysis.
Results: Patients undergoing breast conservation, identified by MammaPrint as low risk, had a local-regional recurrence risk of 3.9% at 5 years and 11.9% at 10 years. The MammaPrint high- risk patients had a local-regional recurrence risk of 18.5% at 5 years and 35.6% at 10 years. The MammaPrint high-risk patients who were also high grade had a local-regional recurrence risk of 23.7% at 5 years and 41.5% at 10 years. Univariate analysis of risk factors known at the time of diagnosis revealed that ER neg, high grade, and MammaPrint high risk were statistically significant predictors of local-regional recurrence. However, when multivariate analysis was performed, high grade and MammaPrint high risk

were the only predictors of local-regional recurrence. Chemotherapy use did decrease local regional recurrence but is not a variable known at the time of diagnosis.
Conclusions: In node-negative patients undergoing breast conservation therapy, the MammaPrint 70-gene assay is predictive of local regional recurrence risk. MammaPrint analysis could help define patients who would benefit from more comprehensive treatment (nodal irradiation, tumor bed boost, or mastectomy +/- reconstruction), as well as identify a patient subgroup that may be safely treated with a targeted approach (partial breast irradiation or IORT). The MammaPrint 70-gene assay allows for a more individualized approach to local-regional therapy.

0216 Neonatal Mastitis Requiring Incision and Drainage: An Institutional Experience
Shahida Bibi, Salma Khan, Muhammad Arshad
Aga Khan University Hospital, Karachi, Pakistan
Objectives: To determine disease characteristics of infants presenting with neonatal mastitis and the short-term outcome of the disease in terms of complications.
Method: We retrospectively evaluated 29 cases of neonatal mastitis at Aga Khan University Hospital with regards to age at presentation, gender, risk factors, clinical symptoms, clinical signs, treatment given both medical and surgical, bacterial culture, sensitivities, hospital stay, systemic and/or local complication, and the available follow-up. Percentages were determined for the above variable. Data was analyzed on SPSS 16.
Results: Twenty-nine cases with diagnosis of neonatal mastitis between 1998 and 2011 were studied. Twenty-seven cases were below age of 4 weeks. Two cases were between 4 to 8 weeks. Twenty-two cases (76%) were female infants and 7 were male infants (24%). All infants were full term at birth. There were no co-morbid conditions associated, except 1 child had ventricular septal defect (VSD). Twenty-eight patients (97%) presented with breast lump/mass, and 19 had associated fever (68%). Associated fluctuation was seen in nearly half of the patients (51%). Most cases were of unilateral mastitis 90% (26 cases) and only 3 cases were bilateral (10%). Twenty-eight cases (97%) required surgical drainage along with antibiotic treatment and 1 spontaneously drained. All cases were diagnosed clinically. Culture of pus grew *Staphylococcus aureus* in 28 cases (97%) and 1 patient had *Streptococcus*. All were sensitive to cloxacillin (100%) and this was the antibiotic used in all cases. Sixteen (55%) patients also underwent septic work-up. None showed a positive blood culture. Mean hospital stay was 2 days. Mean antibiotic treatment was 7 days. We did not observe any local or systemic complications in this series of patient. Twenty-week follow-up was available, but we did not observe any recurrence of wound-related complication.
Conclusions: Neonatal mastitis is a rare disease that usually follows a benign course. But potential complications related to long-term breast developmental issues and systemic issues could be anticipated and hence requires prompt treatment. Long-term follow-up is needed to determine the effect on breast development.

0174 Practice Patterns in the Treatment of Breast Cancer: An Analysis of the Mastery of Breast Surgery Program Participants
Julie Billar[1], Amylou Dueck[1], Richard Gray[1], Nabil Wasif[1], Sarah McLaughlin[2], Edward Clifford[3], Eric Whitacre[4], Barbara Pockaj[1]
[1]Mayo Clinic Arizona, Phoenix, AZ, USA, [2]Mayo Clinic Florida, Jacksonville, FL, USA, [3]Baylor Medical Center, Irving, TX, USA, [4]Breast Center of Southern Arizona, Tucson, AZ, USA
Objectives: To describe the contemporary treatment of patients with breast cancer by surgeons who participate in The American Society of Breast Surgeons Mastery of Breast Surgery Program.
Method: All patients who underwent at least 1 operation for the indication of biopsy-proven malignancy from July 2010 through June 2011 were identified through the Mastery of Breast Surgery database from The American Society of Breast Surgeons. Patient and surgeon demographics, surgical therapy delivered, and adherence to quality metrics are described.
Results: A total of 23,402 operations were reported for 18,146 patients. Of those procedures, 21,374 (91%) were performed for biopsy-proven malignancy, while 899 (4%) were prophylactic operations. Lumpectomy alone was performed in 2639 cases (11%), of which 2,281 (86%) were conducted with imaging guidance. Lumpectomy in conjunction with axillary staging was performed in 8,197 cases (35%), of which 6,825 (83%) included imaging guidance. Sentinel lymph node biopsy (SLNB) alone was the main method of axillary evaluation for those undergoing lumpectomy (n = 7050, 86%), while 684 (8%) had

SLNB followed by immediate axillary lymph node dissection (ALND), and 463 (6%) had ALND alone. Re-excision at the lumpectomy site constituted 8% of cases (n = 1866), with the vast majority reported by the same surgeon who performed the initial operation. Thirty-four percent of procedures were mastectomies (n = 8,054), of which <1% (n = 62) were nipple-sparing. Of the mastectomies, 6,142 (76%) were performed with axillary staging, and similar to patients undergoing lumpectomy, axillary evaluation for those undergoing mastectomy was primarily by SLNB alone (n = 4017; 65%), while 920 (15%) had SLNB followed by immediate ALND, and 1,205 (20%) underwent modified radical mastectomy. Separate axillary staging procedures were uncommon, with only 383 SLNB and 294 ALND cases reported as independent operations. Fifteen percent of patients underwent bilateral procedures, but only 5% of bilateral operations were performed on the same day. Mastery of Breast Surgery contributors practice in every state and also internationally, with 22% of entries from the Northeast, 35% from the South, 19% from the Midwest, and 22% from the West. The majority of contributors work in a group private practice (n = 12,291; 53%) and consider their surgical practice to involve 100% breast patients (n = 17,647; 75%). Where applicable, Mastery users report strong adherence to quality measures in preoperative needle biopsy of target lesions (94%), surgical specimen orientation (98%), and intraoperative confirmation of the removal of nonpalpable lesions that were localized by imaging guidance (98%). Perioperative use of antibiotics and venous thromboembolism prophylaxis was utilized in the majority of cases (98% and 96%, respectively).
Conclusions: Participants in the Mastery of Breast Surgery Program come from a variety of practice settings and offer multiple surgical approaches to patients with breast cancer. The majority of these surgeons have a concentrated breast practice, and perform both lumpectomy and mastectomy in similar proportions when axillary evaluation is needed. Although this study could not correlate surgical procedure to pathology, the vast majority of patients were able to undergo SLNB alone for axillary staging.

0202 Imaging Modalities in Screening of Dense Breasts: Is Mammogram Alone Good Enough?
Jennifer Bishop, Leah Bassin, KC Hall, Lia Harris, Sunny Mitchell
Stamford Hospital, Stamford, CT, USA
Objectives: Since 2009, a Connecticut law mandates insurance companies cover screening breast ultrasounds for women with mammographically dense breasts. The influx of data from these ultrasounds inspired this study to compare amongst pathology-proven breast cancers in women with dense breasts which imaging modality was best able to delineate potentially malignant lesions. Prior studies in this population have quoted a cancer-detection rate of 0.4% with addition of ultrasound to negative mammograms.
Method: This IRB-approved retrospective chart review analyzed all patients diagnosed with breast cancer in our cancer center's database from October 2009 through August 2011. Inclusion criteria were dense breasts on mammogram (50-100%), screening ultrasound, and DCIS or invasive carcinoma on pathology. Exclusion criteria included palpable masses or nonscreening imaging. MRI, if obtained, ultrasound, and mammogram BI-RADS scores were compared.
Results: Of 261 newly diagnosed breast cancers, 61 had dense breasts fitting inclusion criteria. The other 200 were excluded for nondense breasts, incomplete imaging work-up, incomplete pathology, or palpable masses. Eleven of 61 breast cancers (18%) were found on ultrasound alone. Seven of 61 cancers (11%) were seen on mammogram and not ultrasound, mostly stage 0. Forty-one of 61 patients also had an MRI as part of their work-up, and 13 cancers were diagnosed only by MRI.
Conclusions: The sensitivity of mammography to detect breast cancer in women with dense breasts was only 59% in our study group. Ultrasound yielded an also low sensitivity of 65%. MRI sensitivity was 97% when obtained. Although most cancers seen only on ultrasound had low-stage tumors with negative nodes, we did find 5 women with advanced disease (stage 2A to 3A) picked up with either MRI or ultrasound with BI-RADS 0 or 2 mammograms. Sensitivity for mammogram and ultrasound are lower than expected in this population and yields compelling data to recommend continuing screening women with dense breasts with mammogram and adjunct imaging modalities.

0195 The Importance of Multidisciplinary Collaboration Between Surgeon and Radiation Oncologist for Optimal Choice and Placement of Single-Entry Brachytherapy Catheters for Accelerated Partial Breast Irradiation

Elizabeth Bloom, Kent Gifford, Steve Kirsner, Chris Nelson, Bryan Mason, Maria Bejarano, Susan Hoover, Kelly Hunt, Isabelle Bedrosian, Gildy Babiera
University of Texas M. D. Anderson Cancer Center, Houston, TX, USA

Objectives: There are no standard guidelines as to the approach of placement of single-entry breast brachytherapy catheters for accelerated partial breast irradiation (APBI). We sought to demonstrate the importance of collaboration between the radiation oncologist and surgeon from the initial diagnosis of a patient with early-stage breast cancer in order to optimize the conformance of a brachytherapy device to breast tissue for patients treated adjuvantly with APBI.

Method: One hundred twenty-three cases of a total of 136 patients were treated with APBI using single-entry breast brachytherapy catheters on the M. D. Anderson IRB-approved prospective study. Eligibility criteria included: patient age ≥50 years old, unifocal disease, tumor size ≤3 cm, resection margins ≥2 mm, node negative, histology: invasive adenocarcinoma or DCIS. Bilateral breast MRI was required in cases of invasive lobular carcinoma to confirm clinically unifocal disease. All patients received high-dose rate brachytherapy to a total dose of 34 Gy utilizing an iridium-192 source. Patients were evaluated prior to surgery by both the breast surgeon and the radiation oncologist. For patients eligible for APBI based on criteria and who elected adjuvant APBI, a preliminary calendar of breast-conserving surgery, CT cavity evaluation, ultrasound-guided catheter placement, and CT planning was scheduled. After surgery, if patients met eligibility criteria for APBI as outlined in the study, CT cavity evaluation was performed in the radiation oncology department within 2 days of planned catheter insertion. The cavity was contoured on the treatment planning system. The radiation oncologist and surgeon reviewed serial axial images as well as 3-D volume renderings from the CT scan of the patient prior to insertion. Preliminary choice of brachytherapy device, size, and direction of placement was made jointly. The choice was finalized at the time of ultrasound-guided placement in the clinic by the surgeon. At the time of CT for treatment planning, the percentage of nonconformance of the catheter to breast tissue was calculated to ensure appropriate dosimetric coverage of the targeted breast tissue (PTV_EVAL). The percentage nonconformance was defined as the volume of air and/or seroma outside the periphery of the brachytherapy device divided by the volume of the PTV_EVAL multiplied by 100. Nonconformance was ideally 0%, less than 10% was considered acceptable if dosimetric coverage of targeted breast tissue was achieved.

Results: The average age of patients treated was 61 years old (50 to 84 years old) with an average tumor size of 11 mm (1 mm to 27 mm). The mean length of time between segmental resection and catheter placement was 14 days (0 to 69 days). CT cavity evaluation with discussion between breast surgeon and radiation oncologist followed by ultrasound-guided placement of the single-entry brachytherapy catheter resulted in a mean nonconformance of the catheter to breast tissue of 1% (0% to 8.9%).

Conclusions: Multidisciplinary collaboration of surgeon and radiation oncologist for patients scheduled for APBI allows optimization of choice of catheter and size to maximize conformance of device to the targeted breast tissue. This approach may ultimately improve outcomes. Long-term follow-up will be needed to verify these findings.

0218 The Utilization of Surgical Clips to Target the Boost May Need to Be Refined When Oncoplastic Remodeling of the Breast Is Performed at the Time of Lumpectomy

Dorothy Boo, Juskaran Chadha, Manju Harsharan, Susan Boolbol, Manjeet Chadha
Beth Israel Medical Center, New York, NY, USA

Objectives: Surgical clips are used to delineate the lumpectomy cavity and improve accuracy for targeting the tumor bed for delivering 3D conformal radiation therapy. The practice of oncoplastic remodeling of breast tissues after lumpectomy is gaining wide acceptance. The purpose of this study is to characterize the spatial distribution of clips based on surgical procedure. Further, these observations might help refine RT planning target volume in context of the surgical technique used.

Method: The surgical technique for lumpectomy included either oncopastic remodeling (OR) and closure of the cavity, or surgery leaving an open cavity for seroma (ST). We identified 14 consecutive patients with early-stage breast cancer who had undergone OR with no more than 1 re-excision, when indicated. Another 14 patients who underwent ST were randomly selected from retrospective review to match the T-size and number of excisions. Data regarding the average number of clips, and volume encompassed by

the clips were collected from the treatment planning CT scans. For each patient, the maximal distance between clips in the superior, inferior, medial, lateral, anterior, posterior direction was measured using the measurement tool within the planning system. Further, formula 4/3 π a*b*c, where a = medial- lateral radius, b = superior-inferior radius, c = anterior-posterior radius of the respective distances, was used to calculate the volume encompassed by the clips.
Results: The number of clips in the breast ranged from 4 to 7, with the average number of clips being 5.4 in the OR group and 4.5 in the ST group. The median T-size in the OR cases is 0.9 cm and among the ST cases is 1.5 cm The average target volume encompassed within the clips was 34 cc (maximum, 90 cc) in patients undergoing OR compared to 7.7 cc (maximum, 17.7 cc) among ST patients.
Conclusions: Changes in surgical technique may directly impact on the RT techniques, and hence close collaboration with the surgical team in the multidisciplinary care of breast cancer is very important. On average, we observed that when using clips to identify target volume for patients undergoing OR a 4x greater volume would be included as gross target volume, as compared to women who did not for women with early-stage disease. As treating radiation oncologist, this may be a factor to consider when considering the extent of margin added beyond the gross target volume in the breast. Further study to refine image-based radiation therapy in breast cancer is warranted.

0220 Validation of the Use of a Nurse Navigator in a Multispecialty Group Breast Center
Carol Boyer, Theresa Galla, Jerrold Lozner, Winnie Polen, John Cunningham
Summit Medical Group, Berkeley Heights, NJ, USA
Objectives: A nurse navigator has become an essential part of a comprehensive breast center. The navigator's main responsibility is to provide the patient recently diagnosed with an abnormal mammogram the support to navigate the health care system. This includes scheduling appointments, providing education related to the patient's diagnosis, and following the patient to the completion of his/her care. This study evaluates the effectiveness of a nurse navigator in retaining patients within our multispecialty group (SMG) practice after they have been informed that their mammogram was a BI-RADS 4 or 5.
Method: A retrospective review identified all patients with a BI-RADS 4 or 5 mammogram diagnosis in 2007. Charts were reviewed to determine if patients had a biopsy, where the biopsy was done and whether it was benign or malignant. The nurse navigation program was implemented at the SMG in 2008. No other changes were made in the management of breast patients over the next 2 years. A similar review was done for all mammograms done in 2010. All biopsies were performed by 1 surgical oncologist and 2 general surgeons. There was no formal breast center and all patients were seen in a general surgery setting.
Results: There were 7,819 mammograms performed in 2007 and 8,625 performed in 2010 at the SMG. The rate of either a BI-RADS 4 or 5 mammogram was the same in both of those years. The rate of malignant biopsies was also comparable during those 2 years (18% vs 21%). The percentage of biopsies performed at SMG in 2007 was 72% and this rate increased to 82% in 2010. Of the patients diagnosed with a malignancy at SMG in 2007, 61% had their definitive treatment at an outside institution. In 2010, only 8% of those patients diagnosed with a malignancy at SMG had their definitive cancer surgery elsewhere. Also, patient satisfaction surveys showed a dramatic improvement in score during this time period.
Conclusions: There has been an increase in the number of mammograms performed annually at the SMG from 2007 to 2010. The rate of a BI-RADS 4 or 5 finding and the rate of malignancy did not change over this time period. The number of patients who stayed at the SMG to have their initial biopsy and subsequent definitive surgery increased significantly. Since the only change in the care of these patients over this time period was the use of a nurse navigator, it appears that the use of a nurse navigator at the SMG has resulted in increased patient satisfaction, patient retention, and improved continuity of care.

0182 The Accuracy of Axillary Ultrasonography With Biopsy in Predicting Non-Sentinel Lymph Node Metastasis in Operable Breast Cancer Patients
Omaima bu Ali, Sheikha Al Sharri, Adnan Kassis, Sabir Hussain, Mohamed Al Bashir
Tawam Hospital, Al-Ain, United Arab Emirates
Objectives: Sentinel lymph node (SLN) biopsy is considered to be the standard of care in staging the axilla. Axillary lymph node dissection (ALND) is reserved for patients with positive SLN biopsy. However, the non-sentinel lymph nodes (NSLN) are usually not involved in the majority of operable breast cancer patients and many patients undergo unnecessary ALND. The purpose of this study is to evaluate whether

or not axillary ultrasound in combination with ultrasound-guided biopsy (AUS +/- Bx) can predict involvement of NSLN.
Method: Retrospective review of all operable breast cancer patients who underwent (AUS +/- Bx) at our tertiary care center from January 2010 through April 2011 was performed. The results of (AUS +/- Bx) were compared with ALND or SLN biopsy reports.
Results: Eight-eight patients were included in our final analysis. All patients underwent AUS as part of their preoperative evaluation. If the AUS was suspicious, fine-needle aspiration (FNA) or core-needle biopsy (CNB) was performed. Sixty-eight patients (77.3%) had negative AUS +/- Bx and underwent SLN biopsy at time of definitive surgery. If SLN biopsy was positive, ALND was performed. All 20 patients (22.7%) with positive AUS +/- Bx underwent ALND without SLN biopsy. Forty patients (45.4%) had positive axillary lymph nodes on SLN or ALND. Fifteen patients (17.0%) with positive SLN biopsy had negative NSLN. A total of 63 patients (71.6%) had either negative SLN or NSLN. The sensitivity, specificity, negative predictive value, positive predictive value, and accuracy of AUS +/- Bx in predicting NSLN involvement were 76.0%, 98.4%, 91.2%, 95.0%, and 92.0%, respectively.
Conclusions: A negative AUS +/- Bx may be a predictor of noninvolvement of NSLN in operable breast cancer patients. Patients with negative AUS +/- Bx may undergo SLN biopsy alone, regardless of the SLN status.

0128 The Predictive Value of Micro-Computed Tomography for Margin Assessment in Breast Cancer Lumpectomy Specimens
Julliette Buckley, Leopoldo Fernandez, Elena Brachtel, Owen Aftreth, Rong Tang, James Michaelson, Suzanne Coopey, Michele Gadd, Michelle Specht, Kevin Hughes, Frederick Koerner, Barbara Smith
Massachusetts General Hospital, Boston, MA, USA
Objectives: Lumpectomy with microscopically clear margins is a safe and effective approach for surgical management of breast cancer. Unfortunately, rates of positive lumpectomy margins requiring re-excision are as high as 20-50%. Improved strategies are needed to address this problem. We describe the novel use of micro-computed tomography (micro-CT) to determine the margin status of breast lumpectomy specimens, and compare micro-CT assessment of margins with the final pathologic margin status.
Method: IRB-approved prospective consent was obtained for additional imaging of excised lumpectomy specimens. Seventy-one specimens were evaluated with a table top micro-CT scanner, Skyscan 1173 (Skyscan, Belgium). Micro-CT images of the specimens were evaluated for tumor distance to margins and were compared to lumpectomy margin status as determined by routine histopathological processing (Fig 1). A training set of 13 lumpectomy specimens with close or positive margins was initially analyzed.
Results: Micro-CT scanning of specimens took <15 min, a time potentially acceptable for intraoperative use. Specimen images could be rotated in all directions to allow margin assessment. Lumpectomy margins were close or positive in 92.3% (12/13) of cases by micro-CT and in 84.6% (11/13) cases by histopathology. Margin status by micro-CT was concordant with final pathology in 69.2% (9/13) of specimens. Micro-CT overestimated margin involvement in the other 4 specimens (30.7%). In this small dataset, micro-CT has sensitivity of 1 and a specificity of 66.6% for the evaluation of margin involvement by tumor in lumpectomy specimens. The positive predictive value of micro-CT for margin evaluation was 91.6% and the negative predictive value was 100%.
Conclusions: Micro-CT is a potentially useful tool for real-time prediction of margin involvement by tumor in breast lumpectomy specimens and may allow immediate re-excision of positive margins.

0173 Is Application of the Z0011 Criteria a Cost-Effective Strategy?
Melissa Camp, Rachel Greenup, Alphonse Taghian, Suzanne Coopey, Michelle Specht, Michele Gadd, Kevin Hughes, Barbara Smith
Massachusetts General Hospital, Boston, MA, USA
Objectives: The ACOSOG Z0011 (Z0011) trial concluded that sentinel lymph node biopsy (SLNB) without completion axillary lymph node dissection (ALND) provides excellent regional control in women with T1-T2 sentinel lymph node (SLN) positive breast cancers receiving breast conservation therapy. With increasing awareness of health care costs relative to quality, it is essential to identify measures that contain costs without adversely affecting outcomes. We determined whether application of Z0011 guidelines to eligible patients would be a cost-effective strategy.
Method: We performed a retrospective chart review of patients with invasive breast cancer treated with lumpectomy and SLNB at our institution during 2009 and determined which node-positive patients would

have been eligible to forego completion ALND based on Z0011 criteria. We determined the number of overnight hospital admissions following ALND and estimated the costs pertaining to the perioperative surgical management of the axilla patients actually received (costs included were limited to surgeon fees, OR time, and pathology interpretation), and compared those to the estimated number of admissions and perioperative costs if Z0011 guidelines had been followed for eligible patients. The 2011 Medicare Fee Schedule was used to estimate costs for operative procedures and pathology interpretation, and costs for OR time were estimated using procedure length and cost of OR time per minute.
Results: Among 1,105 patients treated for breast cancer in 2009, 71 (6%) underwent lumpectomy with SLNB and had at least 1 positive SLN. Forty-four patients (62%) had a positive SLN identified on intraoperative frozen section and underwent immediate completion ALND. Twenty-one patients (30%) had a positive SLN identified on permanent section and underwent delayed completion ALND, and 6 (8%) had a positive SLN identified on permanent section but did not undergo ALND. Thirty-six patients (51%) stayed overnight in the hospital (50% following immediate and 67% following delayed ALND). In this cohort of 71 patients, estimated costs related to perioperative surgical management of the axilla were $291,671. Applying Z0011 criteria, 51 of our 71 patients (72%) would have been eligible to forego completion ALND. Twenty patients (28%) were ineligible and would have required delayed completion ALND. Estimated costs using Z0011 criteria, assuming no frozen section, would have been $264,513. Thirteen patients (18%) would have stayed overnight in the hospital, assuming a 67% overnight admission rate following delayed ALND. This translates into a 9% reduction in early perioperative costs and a 64% decrease in inpatient hospital days compared to standard 2009 management. Omission of axillary dissection is also expected to reduce postoperative costs related to axillary drain removal, seroma aspiration, physical therapy for shoulder dysfunction, and treatment of lymphedema.
Conclusions: Seventy-two percent of our SLN positive patients undergoing breast-conserving therapy could have avoided ALND if ACOSOG Z0011 guidelines had been applied, resulting in a 64% reduction in inpatient hospital days and a 9% reduction in early perioperative costs. Extrapolating our findings to the total number of Z0011 eligible breast cancer patients in the U.S. would result in a substantial reduction of costs to the health care system.

0168 The Identification of Internal Mammary Sentinel Lymph Node Metastasis Impacts Therapy in Breast Cancer
Abigail Caudle, Min Yi, Elizabeth Mittendorf, Gildy Babiera, Rosa Hwang, Funda Meric-Bernstam, Aysegul Sahin, Kelly Hunt
Univ of Texas MD Anderson Cancer Center, Houston, TX, USA
Objectives: Accurate assessment of the regional lymph node basins is important in staging and local-regional management of breast cancer. While internal mammary (IM) nodal metastasis is not as common as axillary metastasis, discovering occult disease in the IM nodal basin can have a significant impact on prognosis and treatment, as demonstrated by the classification in the AJCC staging system. The goal of this study was to identify characteristics associated with positive IM sentinel lymph nodes (SLN).
Method: Following IRB approval, our prospectively maintained breast and pathology databases were used to identify patients with clinically node-negative breast cancer who underwent SLN dissection, including removal of IM SLNs. Clinical, pathologic, and operative details were reviewed. Statistical analysis was performed using Fisher exact test and rank-sum tests where appropriate.
Results: Seventy-one patients had IM SLNs removed: 60 (85%) were negative for IM metastasis, while 11 (15%) were positive. In the IM node-negative group, clinical T stages were 68% (41/60) T1, 23% (14/60) T2, and 8% (5/60) T3, compared to 45% (5/11) T1, 36% (4/11) T2, and 18% (2/11) T3 in the node-positive IM SLN group. Nine patients (15%) in the IM node-negative group received neoadjuvant chemotherapy vs 3 (27%) in the IM node-positive group. All patients had injection of radioisotope for SLN mapping, while 48% of the node-negative group and 45% of the node-positive group had blue dye plus radioisotope. Preoperative lymphoscintigraphy drainage patterns were similar in the 2 groups with drainage to IM nodes alone (9% both groups), or IM nodes in addition to axillary drainage (91% both groups). Tumor histology was similar in the 2 groups as was median pathologic tumor size (1.4 cm in IM node-negative vs 1.5 cm in IM node-positive group). In the IM node-negative group, 78% of tumors were estrogen receptor (ER) positive, 57% were progesterone receptor (PR) positive, and 13% were HER2-positive vs 91% ER-positive, 36% PR-positive, and 27% HER2-positive in the IM node-positive cohort. Lymphovascular invasion was present in 20% (12/60) in the IM node-negative group vs 45% (5/11) of the IM node-positive group. No differences were statistically significant. The majority of patients in both

groups had axillary SLNs identified in addition to IM nodes (95% in node-negative group vs 91% in node-positive group). Twelve patients (21%) in the IM node-negative group had axillary SLN metastasis. In the group with positive IM SLNs, 4 patients (40%) were found to have axillary metastasis, thus metastatic disease to the IM SLNs was the only site of nodal metastasis in 60% of patients with IM node-positive SLNs.
Conclusions: Patients with IM node-positive SLNs have similar clinical and pathologic features to those with IM node-negative SLNs, thus limiting the ability to predict IM nodal metastasis preoperatively. The presence of metastatic disease in an IM SLN, however, can have a significant impact on treatment decisions especially since it may be the only site of nodal metastasis. Removal of IM SLNs should be considered when IM drainage is seen on lymphoscintigraphy since this information can affect treatment planning and outcome.

0234 Using Quality Benchmarks to Impact Delivery of Breast Care Among a Regional Health Care System
Jamie Caughran[1,2], Jessica Keto[1,2], Carole Gentry[1,2], Kenda Klotz[1,2], Julie Sproul[2], Kathy-Jo Sampson[2]
[1]Comprehensive Breast Center Saint Mary's Health Care, Grand Rapids, MI, USA, [2]Mercy Cancer Network, Novi, MI, USA
Objectives: In 2009, the Mercy Cancer Network (MCN), a collaboration of 9 ministry organizations, created a series of breast care quality benchmarks in an attempt to standardize and improve care delivered at each individual site. In 2008, Trinity Health committed to improving breast care and acquired digital mammography units for each of its sites. In 2009, several performance goals were selected to improve quality and timeliness of care across the institutions in MCN, uniting the collaborative with a focused breast initiative.
Method: Two initial quality benchmarks were developed between key stakeholders in the system, including a fellowship-trained breast surgeon and administrative leads among the 9 sites. National Quality Metrics for Breast Centers (NQMBC) metrics were also used in development of these benchmarks. The first quality metric developed involved time from screening mammogram to diagnostic imaging, with a goal of 5 business days. The second metric was time from diagnostic imaging to tissue sampling, with a goal of 3 business days. Once the guidelines were established, a database was created and managed by an administrative lead on the team to allow monthly review of the data. The network then presented the rationale and goals to each site. Affinity groups by specialty, including patient navigators, clinical managers, and administrative leads, were developed to monitor the implementation of these benchmarks by monthly teleconferenced reviews in addition to biennial meetings. No new employees were required to implement the new benchmarks.
Results: The improvements in quality metrics are outlined in Figure 1. Timeliness from screening mammogram to diagnostic imaging improved, with average days reduced from 9.9 to 4.2 over a 2-year period, a reduction of 5.7 days (95% CI, 5.2-6.2, $p < 0.0001$). The mean number of days between diagnostic imaging and tissue sampling also decreased from 8.4 days to 3.3 days over 2 years, a reduction of 5.1 days (95% CI, 3.8-6.4, $p < 0.0001$).
Conclusions: The process of identifying areas of improvement and collaboration between sites in sharing best practices made a significant impact in timeliness among participating centers. Our data highlights the potential impact of focused quality care initiatives that are possible over short periods of time. It is unknown whether these results are a direct effect of the interventions applied, or a response to the Hawthorne effect. However, using strategies specifically focused to improve these benchmarks we have significantly improved the timeliness of patient care delivered.

0162 Treatment Decisions in Individuals With Deleterious Mutations of BRCA-1 and/or BRCA-2
Karinn Chambers, Edward J Armstrong, III, Teresa Flippo-Morton, Terry Sarantou, Frederick Greene, Lisa Amacker-North, Brook White, Richard L. White Jr.
Carolinas Medical Center, Charlotte, NC, USA
Objectives: A woman with a known BRCA mutation has a lifetime risk of developing breast cancer of up to 80%. Carolinas Medical Center cares for approximately 600 breast cancer patients annually with genetic testing offered to patients whose history meets commonly established criteria. This study seeks to document the treatment choices made by patients with BRCA mutations.
Method: Since 1996 our genetics group has tested 2,056 individuals. Of these, 246 (12%) carry a mutation of the BRCA-1 and/or BRCA-2 gene. One hundred two of these 246 patients (41%) had no

evidence of cancer at the time of genetic testing. One hundred forty-four of these 246 patients (59%) did carry a diagnosis of cancer at the time of genetic testing. One hundred fourteen patients (79%) of those who had cancer at the time of genetic testing had breast cancer, 18 patients (12.5%) had ovarian cancer, and 5 patients (3.5%) had breast and ovarian cancer. Seven of the 144 (5%) had cancer of other subtypes.
Results: Of the 119 patients who had evidence of breast cancer at the time of BRCA testing, 1 patient has been lost to follow-up and 2 patients have not yet had surgical intervention. Sixty-five (57%) of the remaining 116 patients underwent bilateral mastectomies. Twenty-nine patients underwent unilateral mastectomy (25%) and 21 (18%) were treated with a partial mastectomy. Of the patients treated with partial mastectomy, 14 patients (12%) underwent their operations prior to genetic testing and 6 patients (5%) after testing. Three of the 6 patients who underwent their operation after their genetic testing were being treated for ovarian cancer at the time. Two of these 3 patients had stage IIIc disease while the other patient had stage IV ovarian cancer. Six patients (5%) of the 118 patients with documented follow-up developed a subsequent breast cancer. For these 6 patients, the median interval to the development of a second cancer was 6.5 years (range, 1 to 22 years) after initial diagnosis. One of these patients underwent a completion mastectomy for a recurrent ipsilateral cancer, 1 underwent bilateral mastectomy for a contralateral cancer after partial mastectomy, 3 patients had contralateral cancers treated with partial mastectomy, and 1 patient was subsequently diagnosed with metastatic disease.
Conclusions: In conclusion, the vast majority of BRCA patients in this series elected mastectomy. For these 118 patients, the median follow-up was 5.5 years (range, 1-29 years). The local recurrence rate in this population was 0.8% with no local recurrences noted after mastectomy. Of these patients, 3.4% did develop a subsequent contralateral breast cancer.

0226 Newly Diagnosed Breast Cancer Patients and the Need for a Primary Care Physician at an Urban Public Hospital

Cristina Checka[1], Sylvia Adams[2], Nina Glass[1], Ashley Lamparello[1], Allison Carelli[1], Kathie-Ann Joseph[1]
[1]NYU Department of Surgery, New York, NY, USA, [2]NYU Division of Medical Oncology, New York, NY, USA

Objectives: About half of new breast cancers are detected by screening mammography. This presumes that women have a primary care physician (PCP) and access to regular screening. For some patients who lack a PCP, a new cancer diagnosis is a first encounter with the health care system. It is unknown how many of our breast cancer patients have an established PCP or require a new PCP. This retrospective review at a large public hospital examines demographics, disease characteristics, and screening practices in newly diagnosed women who had a PCP, compared to those who did not. This pilot data is intended to delineate referral patterns, screening practices, the impact on cancer stage, and need for PCPs among new cancer patients.
Method: The institutional tumor registry was queried for new breast cancer diagnoses from 2005-2007, to include 4 years of follow-up data. We excluded patients treated elsewhere after diagnosis. A chart review collected these variables: race, age, family history of breast or ovarian cancer, medical co-morbidities, screening practices, disease detection, and stage at presentation. Univariate analyses between groups were made using chi-square tests for categorical variables and Student *t* test for continuous variables.
Results: We identified 243 breast cancer patients diagnosed and treated at our hospital between 2005 and 2007. Patients with a PCP were referred by primary care and gynecology (n = 167). About one third did not have a PCP (n = 73) and were referred by self, the emergency department, or by cancer screening services. Patients with a PCP were older at the time of diagnosis (58 vs 52 yr, $p = 0.03$). Greater than 90% in both groups were miniorities. Co-morbidities, including hypertension and dyslipidemia, (Table 1) were more common in women with a PCP (82% vs 45%, $p < 0.05$). A significant proportion of women without a PCP, however, had untreated medical co-morbidities. Women with a PCP were more likely to have asymptomatic cancer detected on screening mammography and presented at an earlier stage than women without a PCP, who had more locally advanced and metastastic disease ($p < 0.001$). Thirty patients (12%) from both groups required a referral to a new PCP at the time of diagnosis.

Table 1. Patient Demographics

Total n = 243		Had PCP (n = 167)	No PCP (n = 76)	p value
Race	Caucasian	16 (9.6%)	7 (9.2%)	0.544
	Hispanic	69 (41.3%)	28 (36.8%)	
	African American	32 (19.2%)	10 (13.2%)	
	Chinese	32 (19.2%)	19 (25%)	
	Other Asian	18 (10.7%)	12 (15.8%)	
Age	Mean	57.7 yr	54.2 yr	0.03
	Range	26-97 yr	29-83 yr	
Family history		12 (7.2%)	9 (11.8%)	0.23
Co-morbidities				
Dyslipidemia		54 (32.3%)	11 (14.5%)	0.004
Hypertension		84 (50.3%)	24 (31.6%)	0.006
Diabetes		35 (21%)	11 (14.5%)	0.23

Table 2. Disease-Related Features

Total n = 243	Had PCP (n = 167)	No PCP (n = 73)	p value
Presentation			<0.0001
Asymptomatic (SMG)	95 (56.9%)	19 (25%)	
Palpable by patient	51 (38.5%)	43 (56.6%)	
Palpable by MD	7 (4.2%)	1 (1.3%)	
Other symptoms	6 (3.6%)	3 (4.0%)	
Unknown	8 (4.8%)	10 (13.2%)	
Stage			<0.0001
0	49 (29%)	7 (9.2%)	
I	63 (37.1%)	20 (26.3%)	
II	38 (22.6%)	23 (30.3%)	
III	17 (10.2%)	21 (27.6%)	
IV	0 (1.8%)	5 (6.6%)	

Conclusions: Our institution treats newly diagnosed patients who arrive by a variety of referral patterns. Most women had a PCP, but for 30% their diagnosis was the impetus for a new referral to a PCP. We observed a difference in the women who were referred by an existing PCP and our data highlights the clear impact of a PCP on disease stage at presentation. Women with a PCP presented at earlier and, hence, more curable, stages. We also demonstrate the need for a PCP in newly diagnosed patients who had untreated medical co-morbidities. Additionally, previous studies have demonstrated improved cancer outcomes in patients who are followed by both primary care and oncology specialists, which also highlights the need for a PCP in patients who do not have one at the time of their diagnosis.

0159 Laser Liposuction Using 980-nm Diode Laser vs 1064-nm Nd:YAG for Laser Lipolysis and Lipo- Aspiration for Male Breast Reduction (A Pioneering Largest Personal Series in Australia 2005-2009) – An Effective, Safe, Minimal Invasive Method for Treating Gynecomastia

Patrick Chen
CSD Clinic, Sydney, Australia

Objectives: To evaluate the efficiency and safety of laser lipolysis and lipo-aspiration using pulsed 1064-nm Nd:Yag laser (Smartlipo, Deka; Florence, Italy) and CW 980-nm diode laser (Medart, Denmark) in removal of localized fatty deposits and improving skin firmness to achieve contour correction and volume reduction.

Method: Thirty-five patients with male breasts who were treated with laser lipolysis during December 2005 - Jan 2009 were included in this study. Pulsed 1064-nm Nd: Yag delivered by 600-µm (core diameter) laser fibers and CW 980-nm laser delivered by 1400 (940) µm (core diameter) were used. The energy settings were 10 watts, 40 HZ and 150-1000 mj and 18-30 watts (CW), respectively. Total energy used was between 26458–35000 joules to achieve endpoint. Endpoint was clinical softening at pinch test.

Results: Results were assessed at 4 months by 2 independent observers on clinical grounds by percentage of volume reduction and skin contractions. Average fat reduction was 75%-90% and the results were compared to pictures from standard conventional surgical excisions with subcutaneous mastectomy. There was no report of skin sagging or looseness posttreatment. Fewer than 5% of patients required touch-up procedure. There were 2 asymmetry, 2 localized induration (residual glandularities), 1 transient dermal edema, and 1 irregularity. There were no seroma, infection, hematoma, or burns. Eighty-five percent will consider in favor of laser lipolysis vs conventional surgery. Ten percent was equivocal.

Cases were assessed by a special reconstructive surgical panel for medical benefits and were found to have achieved a satisfactory level of therapeutic correction which was deemed sufficient for attracting compensation.
Conclusions: Both 980-nm diode laser and 1064-nm fiber Nd:Yag laser (G1) lipolysis + lipo-aspiration are highly effective, safe, minimally invasive outpatient liposuction procedures for male breast reduction.

0204 Management and Outcome of Breast Cancer Patients With an Intermediate Oncotype Score
Karen Ching, Paul Tartter, Kwadwo Boachie-Adjei, Sharon Rosenbaum Smith, Alison Estabrook
St. Luke's-Roosevelt Hospital, New York, NY, USA
Objectives: Oncotype DX is a 21-gene assay that calculates the risk of distant recurrence in women with estrogen receptor, lymph node negative breast cancer. It is used by oncologists to identify cancer patients who will not benefit from chemotherapy. Eight-year follow-up from the NSABP B-20 trial shows that the addition of first-generation chemotherapy regimens to tamoxifen only provided benefit for high recurrence score (RS) subjects. Low-RS subjects did not benefit, and the effect on intermediate-RS subjects was indeterminate. These findings indicate that many women are overtreated and do not benefit from chemotherapy. We propose a study that will review our institution's experience and practice in managing breast cancers with an intermediate recurrence score based on the Oncotype DX test, to determine the adjuvant therapy given to this subset of patients, and to follow the outcomes of these clinical decisions.
Method: The institution's prospectively collected Breast Cancer Database was reviewed to identify all breast cancer patients with an Oncotype DX recurrence score of 18-30 (intermediate). Clinical, biochemical, and pathological factors available from the database were examined and analyzed to identify variables causing clinicians to recommend adjuvant chemotherapy in addition to hormonal therapy. The chosen adjuvant treatments were collected, and the outcomes of these patients followed up. Patient identifiers were taken out prior to data analysis. Data analysis was done through the use of SPSS (Statistical Package for the Social Sciences) software.
Results: An intermediate oncotype score (18-30) was given to 157 estrogen receptor positive, node-negative breast cancer patients seen in our institution from 2007 to 2011. The patients ranged in age from 25 to 83 years (mean, 55 years). Ten percent (15) received adjuvant chemotherapy only, 38% (59) received chemotherapy and anti-estrogen therapy, 36% (57) received anti-estrogen therapy only, and 17% (26) received no adjuvant therapy. There was no relationship between adjuvant therapy received and patient's age, race, hormone use or family history; tumor size, stage and histologic characteristics (i.e., vascular, lymphatic, perineural or extracapsular invasion); or final surgical treatment received by patient, both in univariate and multivariate analysis. Patients whose tumors had lymphovascular invasion (LVI) were more likely to receive adjuvant therapy (chemotherapy and/or anti-estrogen therapy) than patients who did not have LVI (13.9% VS 0%, $p = 0.083$). At median follow-up of 42 months, 6.4% of the patients have recurred. Two patients (2.7%) who received chemotherapy have developed distant metastasis. No patient in the anti-estrogen only or untreated group developed distant metastasis. Local recurrences have occurred in all these groups: 3 (4.1%) in the chemotherapy with or without anti-estrogen group, 4 (7%) in the anti-estrogen only group, and 1 (3.8%) in the no treatment group. There was no difference in recurrence rates related to receipt of adjuvant therapy. Moreover, there was no difference in time to recurrence among the groups.
Conclusions: There is heterogeneity with regard to how physicians decide to treat patients with breast cancers with intermediate oncotype scores. This study found no significant differences in outcome for adjuvant chemotherapy or hormonal therapy in patients with intermediate oncotype scores.

0194 Effect of Radiologist's Experience on the Predictive Value of Breast Magnetic Resonance Imaging (MRI)
Moira Christoudias[1], Caramarie Guilfoyle[1], Abigail Collett[1], Edward Gracely[2], Thomas Frazier[1], Andrea Barrio[1]
[1]The Bryn Mawr Hospital, Bryn Mawr, PA, USA, [2]Drexel University College of Medicine and Drexel University, Philadelphia, PA, USA
Objectives: The American College of Radiology (ACR) has established breast MRI accreditation requirements which set standards for interpreting physicians. However, there is a paucity of data on the effects of radiologist's experience on breast MRI interpretation. The literature has demonstrated differences in mammographic interpretation associated with completion of a breast imaging fellowship, as well as the number of years in practice. It seems reasonable to expect similar differences with

interpretation of breast MRIs. The purpose of this study was to evaluate the effect of radiologist's experience on the predictive value of breast MRI. We also studied whether the use of computer-assisted detection (CAD) impacted the radiologist's interpretation of MRI.
Method: A single-institution IRB-approved retrospective chart review was performed from January 2003 to September 2011. We identified 3,915 MRIs that were performed as either screening or diagnostic studies interpreted by 3 radiologists. Two groups were analyzed to evaluate the effect of volume of MRIs interpreted and the use of CAD. The pre-CAD group included 156 MRIs performed from January 1 to June 22, 2007. The CAD group included 273 MRIs performed from January 1 to June 22, 2011, with VIBRANT software. The number of biopsies recommended were calculated from lesions interpreted as likely malignant and biopsy suggested. Pathology of these lesions was then correlated with biopsy, segmental resection, or mastectomy.
Results: Three radiologists individually read 1,941, 1,060, and 914 breast MRIs from January 2003 through September 2011, with respective yearly averages of 242.6, 132.5, and 152.3. The pre-CAD group consisted of 78, 34, and 44 MRIs read by radiologists 1 through 3, respectively. The CAD group consisted of 131, 71, and 71 MRIs read by radiologists 1 through 3, respectively. There was no significant difference in positive predictive value (PPV) between radiologists in either the pre-CAD group (35.7% vs 27.3% vs 31.6%, $p = 0.9$) or the CAD group (37.3% vs 31.6% vs 47.8%, $p = 0.51$). Furthermore, the introduction of CAD did not improve individual radiologist interpretation of MRI [35.7% vs 37.3%, $p = 0.46$ (radiologist 1); 27.3% vs 31.6%, $p = 0.43$ (radiologist 2); 33.3% vs 47.8%, $p = 0.36$ (radiologist 3)]. CAD did not collectively improve the PPV of MRI, irrespective of radiologist (32.4% vs 38.7%, $p = 0.26$).
Conclusions: There was no difference in PPV for breast MRI between radiologists at our community comprehensive breast center. Since our radiologists have exceeded the ACR accreditation requirements of 150 breast MRI interpretations in a 3-year period, our findings suggest that a plateau in the PPV may exist after a certain volume of MRIs are interpreted. The introduction of CAD in our community hospital has not significantly impacted radiologist interpretation of MRI. Our study supports having patients undergo breast MRIs in facilities that have met the ACR accreditation standards to maximize diagnostic accuracy.

0069 Mammography vs Ultrasound in the Differentiation of Fibroadenoma and Phyllodes Tumors: A Retrospective Analysis
Sarah Colwick, Paul Pace, Denise Barajas, Tassos Kyriakides
Hospital of Saint Raphael, New Haven, CT, USA
Objectives: To compare and correlate radiographic diagnosis with final breast pathology in women with suspected fibroadenoma versus phyllodes tumors.
Method: A retrospective review consisting of 412 women from 2000-2008 with a pathologic diagnosis of fibroadenoma or phyllodes tumors. Of the 412 patients reviewed, 324 were diagnosed via mammography or ultrasound. Chi-square analysis and Fisher exact test were performed to assess the relationship between method of radiographic diagnosis and final breast pathology. Logistic regression was also used to assess factors related to the diagnosis.
Results: Fibroadenomas were more likely to have been detected by mammography than ultrasound (69% vs 31%); however, more phyllodes tumors had been detected by ultrasound (55% vs 45%) in comparison to mammography ($p = 0.03$). Radiographic features on mammography and ultrasound that demonstrated consistency in the diagnosis of fibroadenoma included the presence of microcalcifications, fibroglandular appearance, and ovoid shape. Features that were consistent with the diagnosis of phyllodes included lobulated, hypoechoic, and circular shape. Tumor size (OR = 1.502; 95%CI, 1.1-2.0) and age (OR = 0.95; 95%CI, 0.92-0.99) were significant explanatory variables in a logistic regression model predicting the pathologic diagnosis of phyllodes.
Conclusions: With regards to the differentiation and detection of fibroadenoma and phyllodes tumors, the 2 tests differ in accuracy of diagnosis with ultrasound demonstrating better accuracy in diagnosis of phyllodes. Radiographic features such as lobulated appearance, hypoechoic, and circular shape demonstrated stronger correlation with final pathology of phyllodes tumors. Phyllodes diagnosis appears to have been associated with increased tumor size and younger age.

0070 Use of Preoperative Paravertebral Block Decreases Length of Stay in Patients Undergoing Mastectomy Plus Immediate Reconstruction

Suzanne Coopey, Michelle Specht, Lisa Warren, Barbara Smith, Jonathan Winograd, Katharine Fleischmann

Massachusetts General Hospital, Boston, MA, USA

Objectives: Previous studies have demonstrated that preoperative paravertebral blocks (PVB) significantly decrease postoperative pain, narcotic requirements, and nausea and vomiting in patients undergoing breast surgery. Only 1 prior study compared length of stay between patients who did and did not receive PVB and found no significant difference. However, that study, like most studies, excluded patients undergoing bilateral procedures and those undergoing immediate reconstruction. We sought to determine if the use of preoperative paravertebral blocks in patients undergoing unilateral or bilateral mastectomy plus immediate reconstruction decreases patient length of stay (LOS).

Method: One hundred ninety patients who underwent preoperative paravertebral block prior to mastectomy with immediate reconstruction at a single institution in 2010 were identified. These patients were compared to a similar group of 154 patients who underwent mastectomy with immediate reconstruction without the use of PVB in 2008. Outcomes, including LOS, postoperative nausea and vomiting, and time to oral narcotics were compared between groups.

Results: There were significantly more axillary lymph node dissections performed and tissue expanders (TE) placed in the PVB group. Otherwise, patient characteristics, laterality of surgery, and indication for surgery were similar between groups [Table 1]. Mean LOS for the PVB group was 42 hours (range, 17-101). This was significantly less than the mean LOS of 47 hours (range, 19-102) for the no-block group ($p = 0.0015$). The significantly lower LOS for the PVB group was true for patients undergoing bilateral procedures ($p = 0.045$), unilateral procedures ($p = 0.0031$), tissue expander placement ($p = 0.0114$), and immediate implant placement ($p = 0.037$) (Figure 1). The mean time from end of surgery to conversion to oral narcotics was significantly shorter in the PVB group (15 hours; range, 0-64) compared to the no-block group (20 hours; range, 0-63) ($p < 0.001$). The incidence of postoperative nausea in the PVB group (42.8%) was significantly less than in the no-block group (54.7%) ($p = 0.031$), while there was no significant difference in the incidence of emesis between groups (16.9% vs 22.7%, $p = 0.24$).

Table 1. Comparison of PVB Group to No-Block Group

	PVB Group (n = 190)	**No-Block Group (n = 154)**	***P* value**
Mean age (yr)	47 (range, 19-72)	48 (range, 29-76)	$p = 0.52$
Mean BMI (kg/m^2)	24.8 (range,17.3-53.4)	25.2 (range, 17.8-40.5)	*P = 0.45*
Indication for surgery	160 Cancer (84.2%) 30 Prophylactic (15.8%)	128 Cancer (83.1%) 26 Prophylactic (16.9%)	$p = 0.78$
Laterality of procedure	72 Unilateral (37.9%) 118 Bilateral (62.1%)	58 Unilateral (37.7%) 96 Bilateral (62.3%)	$p = 0.96$
Reconstruction type	105 TE (55.3%) 84 Implant (44.2%) 1 None (0.5%)	69 TE (44.8%) 85 Implant (55.2%)	**$p = 0.048$**
Axillary surgery type	41 ALND (21.6%) 112 SLNB (58.9%) 37 None (19.5%)	11 ALND (7.1%) 113 SLNB (73.4%) 30 None (19.5%)	**$P < 0.001$**

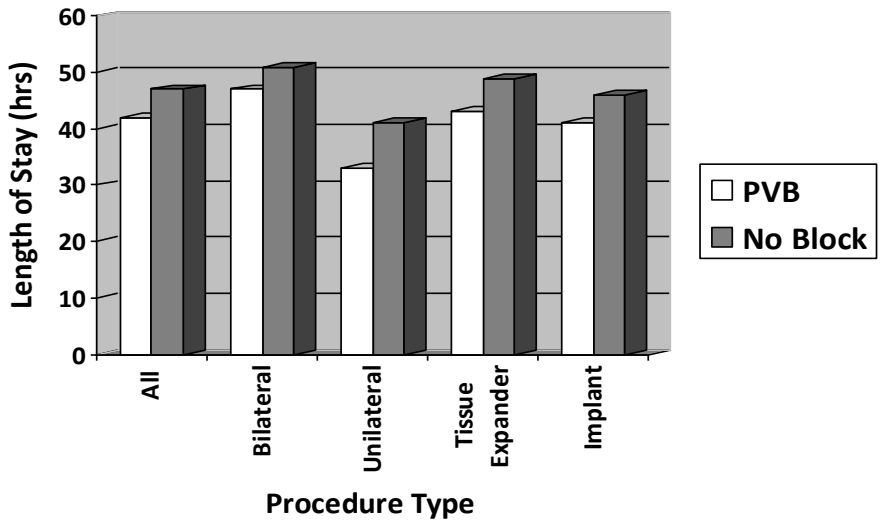


Figure 1. Length of Stay Based on Procedure Type Comparing PVB Group to No Block Group

Conclusions: The routine use of preoperative paravertebral blocks in patients undergoing mastectomy plus immediate tissue expander or implant reconstruction significantly decreases patient length of stay. In addition to improved pain control from the block itself, quicker conversion to oral narcotics because of less postoperative nausea likely contributes to a decreased length of stay.

0023 Nipple Areolar Complex Mastectomies and a 13-Year Retrospective Study From a Community Hospital

John Corbitt Jr.[1,2], Lori Anthony[1], Teresa Vaughn[1], Victoria Vanacore[1]
[1]JFK Medical Center, Lake Worth, FL, USA, [2]University of Miami Miller School of Medicine, Miami, FL, USA

Objectives: The standard treatment of breast cancer from a surgical approach is to eradicate the cancer by excision of the tumor obtaining clear margins. Lumpectomies as a conservative procedure have produced excellent results; however, in cases where mastectomies are necessary or requested, the nipple areolar complex (NAC) skin-sparing mastectomy produces similar results as a lumpectomy or modified radical mastectomy and should be considered for the standard of care. This retrospective study contains statistically significant data to consider NAC mastectomy as an appropriate choice without compromise of the ultimate goal of cancer removal. The preservation of the nipple areolar complex has an additional benefit to the patient both psychologically as well as cosmetically.

Method: NAC skin-sparing mastectomies were first performed by us in 1998 with patients entering the study up until 2011. Between 1998 and 2011, 178 patients underwent 280 NAC skin-sparing mastectomies. These patients were chosen from a group of women who either requested or required a mastectomy. Prophylactic procedures were performed in gene-positive patients or patients with a strong family history of breast cancer. The patients were informed that this procedure was investigational and not a standard of care and were referred to a medical oncologist, a radiation oncologist, and a plastic surgeon for consultation. This procedure was offered to patients regardless of their pathology or tumor location, and no patients were denied the opportunity of undergoing an NAC skin-sparing mastectomy.

Results: A total of 280 NAC mastectomies were performed; 102 were bilateral and 76 were unilateral; 114 were done for invasive cancer; 48 for in situ cancer; 15 were either gene-positive or had a strong family history of cancer, and 1 patient required a mastectomy for an extensive phyllodes tumor. One patient had a nipple recurrence requiring the nipple to be removed and is cancer free 8 years following the second operation. There were 9 patients who had a recurrence to other areas of the breast requiring additional surgery. None of the noncancer patients developed cancer.

Conclusions: This 13-year study demonstrates excellent cancer-free survival using nipple-areolar-sparing mastectomy. This procedure offers superior cosmetic results with additional psychological benefits in the overall treatment of the breast cancer patient.

0268 Routine Completion of Axillary Lymph Node Dissection in Mastectomy Patients Is Not Associated With Improved Disease-Specific Outcome

Jeffrey Crawford[1], Stuart Gardiner[2], Mindy Anstheth[2], James Barnett[2], Tammy De Le Melena[2,1], Nathalie Johnson[2,1]

[1]Oregon Health and Sciences University, Portland, OR, USA, [2]Providence Health System, Portland, OR, USA

Objectives: The current practice of completion axillary node dissection (ALND) for patients with a positive sentinel node (+SLN) is being questioned. Recently published results from the Z-11 trial suggest that in patients undergoing lumpectomy and adjuvant radiation there is no difference in outcome with ALND. This led us to examine outcomes of SLN+ mastectomy patients with and without ALND.

Method: Review of cancer registry data from 2 community hospital systems identified 575 women with breast cancer with +SLN who underwent mastectomy between 2000 and 2010. Of these SLN+ women, 438 underwent ALND and 137 were managed expectantly. Disease-free survival was defined by no local, regional, or distal recurrence assessed at 24 months and 120 months.

Results: The 2 groups, ALND and No ALND, are compared in Table 1. The disease-free survival at 24 months follow-up undergoing ALND was 92.2% (89.8-94.8%), compared to 97.1% (94.3%-99.9%) in the No ALND. Survival rates at 120 months were ALND 84.4% (83.8%-96.8%) and 90.0% (80.3%-88.6%) in the No ALND. See Figure 1 for survival curves of the 2 groups.

Conclusions: In our experience there was no significant difference in disease-free survival in mastectomy patients with +SLN when completion ALND was not performed. This is in concert with recent data suggesting a closer look at the indications for ALND. Given the known risks associated with ALND, this review suggests that morbidity may be obviated with expectant management without compromising disease burden or oncologic outcome. Many factors impact the decision to undergo ALND and it will be useful to identify subgroups that may benefit from ALND.

0067 Disease Recurrence in Sentinel Node-Positive Breast Cancer Patients Foregoing Axillary Lymph Node Dissection

Amy Cyr, Feng Gao, Julie Margenthaler

Washington University, Saint Louis, MO, USA

Objectives: Women with clinically node-negative invasive breast cancer usually undergo sentinel lymph node (SLN) biopsy. When metastasis is identified within the SLN, completion axillary lymph node dissection (CALND) has historically been recommended. Newer data suggest that CALND may be omitted in some women as it does not improve local control or disease-specific survival. Few studies provide long-term follow-up on patients with positive SLNs who forego CALND.

Method: Women 18 and older with invasive breast cancer and a positive SLN diagnosed between January 1, 1999, and August 31, 2010, were included in this retrospective review. Data collected included patient and tumor characteristics, surgical treatment, nodal status, and outcomes. Women with positive SLNs were stratified according to whether they did or did not undergo CALND. Primary endpoints included local-regional recurrence, distant disease recurrence, and breast-cancer specific mortality. Differences between the groups were compared using Fisher exact test, 2-sample *t* test.

Results: Overall, 276 women were included: 206 (79%) women who underwent CALND (Group 1) and 70 (21%) women in whom CALND was omitted (Group 2). Women in Group 1 were younger, had more SLN disease, and received more chemotherapy ($p < 0.05$ for each). The 2 groups did not vary by patient race or tumor characteristics ($p > 0.05$ for each). Median follow-up was 57.5 (range, 6-131) and 56.5 (range, 15-123) months for Groups 1 and 2, respectively. Overall, 4 (2%) women in Group 1 and 3 (4%) women in Group 2 died of breast cancer ($p = 0.38$). Either local, regional, or distant recurrence occurred in 19 (9%) Group 1 patients and in 10 (14%) Group 2 patients ($p = 0.26$). On multivariate analysis, only estrogen receptor negativity and lymphovascular invasion predicted for recurrence.

Conclusions: Omission of CALND in women with SLN disease does not significantly impact the likelihood of in-breast, nodal, or distant recurrence. There is also no significant difference in breast cancer-specific mortality in patients who do or do not undergo CALND. Our findings are similar to recently published data. Longer term follow-up is needed to verify that this remains true with time.

0177 The Impact of a Dedicated Breast Center on Clinical Outcomes: Is It Worth the Time and Effort?

Paul Dale, Donna Richardson, Debra Koivunen, Karl Freter, Debra Deeken
University of Missouri, School of Medicine, Columbia, MO, USA

Objectives: Clinical outcomes continue to be a major focus of medical payers. The development of clinical centers of excellence to positively affect clinical outcomes is becoming more prevalent for health care providers. As a large tertiary referral institution we developed a dedicated breast center to improve patient care delivery and positively affect clinical outcomes. This retrospective review evaluates the clinical outcomes of patients with breast cancer treated at our institution prior to and after the establishment of our breast center.

Method: Our cancer registry data and chart review of breast cancer cases was conducted during 3 separate time periods: Jan-June 2005 (prior to breast center formation) and Jan-June of 2008 (1 year after opening of breast center), and Jan-June 2010 (3 years after opening of the breast center). We utilized the Advisory Board 2009 Tumor Site Dashboard for Breast Cancer as the source of stated benchmarks/outcomes.

Results: The following chart represents the benchmarks evaluated and the respective outcomes during the indicated time frames:

Benchmark	Jan-June 2005	Jan-June 2008	Jan-June 2010
Time to diagnostic mammogram: avg, 20 d	16.5 days	15.4 days	5.4 days
Time from diagnostic mammogram results to needle biopsy: avg, 19d	10.7 days	10.6 days	5.2 days
% of pts. called back for follow-up studies due to abnormal findings: avg, 13.1%	10.9%	8.9%	9.5%
% of mastectomy patients undergoing SN biopsy: expected, 100%	100%	100%	100%
% of DCIS patients receiving mastectomy who also undergo SLN biopsy: expected, 100%	32% (7/22)		100% (15/15)
Frozen-section false-negative rate: <5%	2%	0%	4.6%
Percentage of patients receiving lumpectomy/mastectomy: Ideal, 80% National average, 65%	Lumpectomy: 35 cases, 58% Mastectomy: 30 cases, 46%	Lumpectomy: 40 cases, 58% Mastectomy: 41 cases, 51%	Lumpectomy: 40 cases, 62% Mastectomy: 24 cases, 38%
Re-excision rates due to positive margins	17%	8%	16%
% of patients receiving radiation following lumpectomy: expected, 100%	71%	92%	92%

Conclusions: Most of the benchmarks investigated showed a dramatic increase in performance. Mammography call back times and time from diagnostic mammogram to diagnosis were much improved in the Breast Center setting. An increase in breast-conserving therapy was also demonstrated. The development of our multidisciplinary breast center has required a significant dedication from our institution and health care providers. The addition of a nurse navigator, which occurred in June 2008, has also positively impacted patient outcomes. The dedication of resources developing our dedicated breast center has positively impacted patient care delivery and outcomes at our institution.

0238 Preoperative MRI for Patients With DCIS: Risk or Benefit?

Kathryn Davis, Phillip Goodney, Kari Rosenkranz
Dartmouth Hitchcock Medical Center, Lebanon, NH, USA

Objectives: The role of MRI in preoperative planning for women diagnosed with breast cancer remains controversial. While several studies have confirmed an increase in the detection of multicentric and multifocal breast cancer when routine MRI is performed prior to surgical intervention, the short and long impact of these additional findings is largely unknown. We sought to assess the impact of preoperative MRI specifically in women diagnosed with DCIS.

Method: After obtaining approval from our institutional review board, we performed a retrospective review comparing women treated with attempted breast conservation in our institution between 2007-2008, an era in which we were not using MRI for preoperative planning, to women treated from 2009-2010, during

which time we performed routine preoperative MRI in women diagnosed with DCIS. Endpoints of analysis included number of repeat biopsies, re-excision rates, and rates of conversion to mastectomy.
Results: We studied the charts of 170 patients treated with breast conservation in our institution during the study period. Forty-nine patients did not undergo preoperative MRI and 121 did. Additional biopsies based on MRI findings were performed in 19/121 (15.7%) patients. Of these biopsies, 10/19 ultimately confirmed additional sites of disease, 2 patients with invasive carcinoma, 8 patients in situ. There was no statistically significant difference ($p = 0.41$) in re-excision rates between the 32.2% (39/121) of women who did and 19/49 (38.7%) women who did not undergo MRI. Despite the use of preoperative MRI, 7/121 women (5.7%) were converted to mastectomy due to positive margins compared to 6/49 (12.2%) in the women who did not undergo MRI ($p < 0.05$).
Conclusions: Our data demonstrate that preoperative MRI does not significantly decrease the likelihood for re-excision in women diagnosed with DCIS. While the rate of conversion to mastectomy in women who opted for breast conservation as an initial surgical plan is significantly decreased in women who undergo preoperative MRI, many women with additional lesions on MRI opted for mastectomy prior to additional biopsies and therefore, the overall mastectomy rate may be falsely deflated in our study. Prospective trials are necessary to investigate whether routine preoperative MRI increases overall mastectomy rates, decreases the risk of conversion to mastectomy for breast conservation patients, decreases the stress and cost of re-excisions, or alters local recurrence rates over time.

0223 Factors That Affect a Patient's Decision to Undergo Contralateral Prophylactic Mastectomy: Is Neoadjuvant Chemotherapy One of Them?
Emilia Diego, Kandace McGuire, Atilla Soran, Malak Kanbour, Marguerite Bonaventura, Ronald Johnson, Gretchen Ahrendt
University of Pittsburgh-Magee Womens Hospital, Pittsburgh, PA, USA
Objectives: Numerous studies have documented an increase in contralateral prophylactic mastectomy (CPM) in women undergoing therapeutic mastectomy for unilateral breast cancer. Many clinicopathologic factors have been found to be associated with CPM. However, no study has evaluated CPM specifically in the subset of patients who undergo neoadjuvant chemotherapy (NAC). Although NAC can successfully downstage primary tumors to facilitate breast-conserving surgery, many surgeons have noted that a significant number of patients elect to proceed, not only with total mastectomy (TM), but also with CPM, in order to avoid a future contralateral cancer and a repeat experience with chemotherapy. Despite anecdotal experience, the relationship between NAC and CPM has never been previously published. We hypothesize that patients who receive NAC and proceed to TM are more likely to opt for CPM compared to patients who undergo a primary mastectomy surgery.
Method: Our institutional database was searched for patients treated for breast cancer (BC) between 2004 and 2010 who had surgical treatment in the form of a TM, with or without CPM. Factors known to influence a patient's decision to undergo CPM were analyzed, including age, race, first- and second-degree relatives with BC, family history of ovarian cancer, BRCA 1/2 mutation, histology, pre-treatment MRI, pre-surgical MRI biopsy, histology of the MRI biopsy, previous attempt at BCT, the option for reconstruction. NAC was also analyzed as a possible factor.
Results: A total of 1,806 women were included in the study, of whom 434 received NAC and 1372 did not receive NAC. In the NAC group, 102 (24%) had TM/CPM, while 332 (76%) had only TM. In the non-NAC group, 313 (23%) had TM/CPM, while 1059 (77%) had TM only. The mean age for the TM/CPM group was 48 years (range, 25-85) vs 57 years (range, 20-81) for the TM group ($p < 0.001$). On univariate analysis, Caucasian race, having a first- or second-degree relative with BC, a family history of ovarian cancer, BRCA 1 or 2 positivity, tumor histology (mixed invasive ductal/lobular carcinoma), undergoing a pre-treatment MRI, having a pre-surgical MRI biopsy, and the option to undergo reconstruction were significantly correlated with TM/CPM ($p <0.005$). A previous attempt at BCT was not found to be significant. On multivariate analysis, only age, a first-degree relative with BC, undergoing a pre-treatment MRI and the option for reconstruction remained significant predictors of TM/CPM ($p <0.005$). Receipt of NAC was not significantly associated with CPM.
Conclusions: These results reject the hypothesis that patients who receive NAC and subsequent TM are more likely to undergo CPM. We did, however, confirm that there are several other factors that affect a patient's decision to undergo TM/CPM including younger age, a first-degree relative with BC, pre-treatment MRI, and reconstruction. Our failure to find different rates of CPM between NAC and non-NAC

patients may be the result of a number of factors. Further study, possibly with survey, would help elucidate true patient intent in this population.

0209 Referral Source and Outcomes of Patients With Nipple Discharge

Jesse Dirksen, Carol Scott-Conner, Ronald Weigel, Geeta Lal, Ann Wolf, Junlin Liao, Sonia Sugg
University of Iowa Hospitals and Clinics, Iowa City, IA, USA

Objectives: Nipple discharge **(**ND) is a common cause for referral to breast surgery clinics by primary care providers (PCP) and obstetrics/gynecology (OB/GYN), yet only a proportion undergo operation based on clinical and radiologic findings. Our objective was to evaluate if referral source, symptom duration, or interval to surgical consultation influenced outcomes for patients referred for ND, including whether duct excision (DE) was performed or if cancer (CA) was found.

Method: All patients who presented to our institution from January 2006 to October 2011 with the ICD-9 code for "breast symptoms" (611.79) were identified (no specific code exists for ND). A retrospective chart review was performed on those who were referred to the breast surgery clinic to identify those seen for ND. Results were analyzed using chi-square, *t* test, and Mann-Whitney tests.

Results: One thousand one hundred twenty-one patients with ICD-9 code 611.79 were identified, and 275 were referred to breast surgery clinic for further evaluation. Of those, 125 women had ND. The median age was 43 years (16 to 83). Referrals were from PCP in 77 (62%), OB/GYN in 37 (30%), self in 7 (6%), and other surgeons 4 (3%). Following surgical consultation, 53 patients (42%) were considered to have pathological nipple discharge and underwent microdochectomy in 34 (64%) or central duct excision in 19 (36%). Median time interval from initial symptoms to PCP visit was 62 days (1-4745), from PCP visit to surgery clinic was 7 days (0-55), and from initial symptoms to operation was 111 days (15-3691). Final pathology revealed invasive or in situ cancer in 7 patients (13%), papilloma and duct ectasia in 33 (62%), and other benign findings in 13 (25%). The referral source did not affect the time to referral to breast surgery clinic, DE, or diagnosis of CA. Neither symptom duration nor time to referral for surgery clinic affected DE or CA.

Conclusions: Most patients with ND seen in our breast clinic were referred from PCP and OB/GYN. Only 42% underwent DE, and 13% of those had malignancy diagnosed. The referral source, time to surgery clinic referral, or symptom duration had no difference in outcomes of DE or CA. Referrals in our tertiary Breast Surgery Clinic are appropriate and timely, do not vary between PCP- and OB/GYN-based referrals, and most often result from benign processes.

0165 Changing Outcomes for Early-Stage Breast Cancer Using Physician Extenders

William Dooley, Jeanene Parker, Jinju Bong
University of Oklahoma, Oklahoma City, OK, USA

Objectives: Breast surgeon practices now commonly employ physician extenders to manage well breast care, provide patient navigation in active breast cancer treatment, and manage survivorship clinics, and a host of other duties. We investigated the effects of the use of physician extenders on patient outcomes.

Method: This is an IRB-approved retrospective review of all breast cancer patients undergoing primary treatment for early-stage breast cancer (0, 1, 2a, and 2b) during the years 1995-2008 inclusive at an academic breast center. The patients were stratified by whether their breast surgeon used a nurse practitioner or physician's assistant as a part of the surgical care team. Differences in outcomes and potential drivers of those differences were investigated.

Results: One thousand seven hundred and forty-three patients met the entry criteria. Of those, 599 (34%) were managed with the aid of a physician extender from a primary care background. Mean age, stage distribution, and insurance status were all similar between the 2 groups. The differences in stage-specific overall (OS) and disease-free survival (DFS) are seen in the table.

5-Year Survival

	Without Physician Extender		**With Physician Extender**	
Stage	**OS**	**DFS**	**OS**	**DFS**
0	93.7%	90.0%	95.1%	94.1%
1	88.3%	86.1%	95.1%	89.8%
2a	78.4%	86.1%	87.6%	92.4%
2b	70.8%	65.9%	83.1%	79.1%

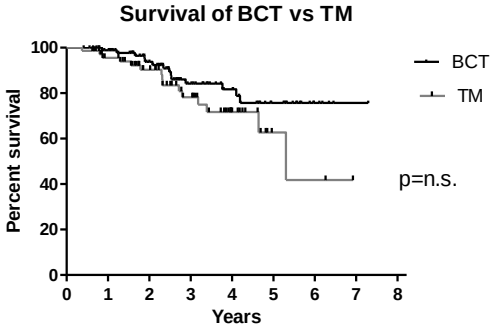
Patients in the physician extender group had on average a 64.1% ($p < 0.001$) reduction in breast cancer associated mortality. This difference was primarily driven by a marked increase in compliance with all aspects of multidisciplinary breast cancer treatment. Physician extender roles in this practice group included enrollment of patients in clinical trials. These patients also had 36.0% ($p < 0.01$) reduction in non-breast cancer deaths. A decrease in heart disease, strokes, and diabetes complications explained these reductions and reflected the involvement of the physician extender in helping patients adopt a healthy lifestyle during survivorship care.
Conclusions: Physician extenders have potentially a very important role in keeping the patient and family engaged to complete all aspects of breast cancer treatment. Further using their primary care background, physician extenders in specialty clinics, such as breast surgeon offices, can positively influence survivorship and "healthy lifestyles" in patients successfully treated for their breast cancer.

0196 Facing a Second Breast Cancer: Choice Made for Operative Management
Shivani Duggal, Kathleen Erb, Thomas B. Julian
Allegheny General Hospital, Pittsburgh, PA, USA
Objectives: Despite the established equivalence in overall survival of breast conservation therapy (BCT) to total mastectomy (TM), recent trends show that TM is increasingly chosen for a new breast cancer diagnosis. Current evidence suggests that more women are having contralateral prophylactic mastectomy (CPM). The aim of our study was to determine in our institution if women, when faced with a second breast cancer diagnosis, chose TM, CPM, or breast conservation.
Method: Upon IRB approval, a retrospective chart review was performed on 156 female patients who developed a second breast cancer treated surgically from January 2000 to December 2010. Data reviewed included type of oncologic surgery performed for both first and second breast cancer, age at first and second diagnoses, ipsilateral breast tumor recurrence (IBTR) vs contralateral breast cancer occurrence (CBC), and time to development of a second breast cancer.
Results: Of 156 patients, 70 were identified as having an IBTR and 86 developed CBCs. Average age at second cancer diagnosis was 66 years (range, 36 to 88 years). Average time to development of a second breast cancer was 11 years (range, 6 months to 34 years). One hundred thirty-two of 156 patients were treated with partial mastectomy (PM) for the first cancer diagnosis, and 24 underwent TM. Of the 132 patients who initially underwent PM, 85 (64%) chose PM for a second breast cancer diagnosis, 42 (32%) chose TM, and 5 (4%) chose bilateral total mastectomy (BTM). PM was more frequently chosen when the second breast cancer occurred as a CBC (55 of 132; 41%) as compared to an IBTR (30 of 132; 22%). In patients treated with TM initially, 10 of 24 (42%) chose PM for a second cancer diagnosis in the contralateral breast, while 14 of 24 (58%) chose TM. In patients treated with PM or TM initially, TM was chosen twice as frequently for an IBTR (24%) than for CBC (11%) for a second cancer diagnosis. Less frequently observed was BTM after PM for either IBTR (1%) or CBC (2%). There was no statistically significant difference in the choice for PM when comparing data from the first and second 5 years ($p = 1.000$). Overall, regardless of type of initial operation, women chose the same operation for a second breast cancer diagnosis as they did for their first cancer diagnosis (64% for PM; 58% for TM).
Conclusions: Despite the current NCCN recommendation of TM for IBTR, and the nationally reported increasing rate of TM and CPM, our study demonstrated that the majority of women at our institution who opted for PM for a primary diagnosis of breast cancer continue to choose breast preservation when faced with a second breast cancer (85 of 132; 64%). When comparing the first and second half of a 10-year span, we observed a trend toward breast preservation in patients diagnosed with CBCs, 45% and 69%, respectively. Further research is needed to determine if our results compare to national trends.

0266 Immediate Implant Breast Reconstruction Is a Safe Option for High-Risk Patients Who Undergo Nipple-Areola or Skin-Sparing Mastectomy for Breast Cancer
Brandice Durkan, Lisa Cassileth, Farin Amersi
Cedars-Sinai Medical Center, Los Angeles, CA, USA
Objectives: Nipple areola-sparing mastectomy (NASM) and skin-sparing mastectomy (SSM) with immediate implant reconstruction has recently become an increasingly acceptable option for patients (pts) with breast cancer or BRCA+ pts; however, there is little data regarding the oncologic safety of this newer technique. Our objective was to identify patient characteristics and evaluate outcomes following immediate implant based reconstruction with allograft.

Method: We performed a retrospective chart review and identified 63 women with breast cancer or who were BRCA+, who underwent NAS or SS mastectomy with immediate implant reconstruction
Results: Of the 63 patients, 71 (64%) breasts had SS mastectomy and 40 (36%) breasts had NAS mastectomy. All breasts were reconstructed at the time of mastectomy with implants and Alloderm. Mean age of pts was 47.9 (range, 25-72) years. Mean time to follow-up was 14.4 (range, 3-58) months. Thirty-six patients (57.1%) underwent BRCA testing, of whom 13 pts (36.1%) were found to be BRCA positive. Fifty-nine (50.4%) of the breast specimens contained tumor, of which 39 (66%) were infiltrating ductal carcinoma, 3 (5.1%) were infiltrating lobular carcinoma, 3 (5.1) had mixed features, and 14 (24%) were DCIS. Mean tumor size was 2 cm (range, 0.2-9 cm). Fifty-nine sentinel lymph node (SLN) biopsies were performed, and 20 of the SLN (34%) had metastatic disease. Five patients (8.3%) had re-excision for close or positive margins. Postoperatively, 5 patients (7.9%) had implant loss, 1 patient (1.7%) had a wound dehiscence that required reoperation, 5 patients (7.9%) underwent implant exchanges for alternate-sized implant (8.3%), and 3 patients (5%) required latissimus-dorsi flaps for additional coverage. Nine patients (14.2%) required postoperative radiation (15%).
Conclusions: This data suggests that SSM or NSM with immediate implant reconstruction is a safe option for patients with breast cancer. Patient selection may play a role in good outcomes for this technique. Reoperation for close tumor margins may still be safely performed following reconstruction using this technique.

0241 Breast-Conserving Therapy vs Total Mastectomy in Triple-Negative Breast Cancer
Amy Eastman, Yolanda Tammaro, Valerie Andrews, David Euhus, James Huth, Marilyn Leitch, Amy Moldrem, Roshni Rao
University of Texas Southwestern, Dallas, TX, USA
Objectives: Breast-conserving therapy (BCT) followed by radiation is an accepted treatment option for patients diagnosed with breast cancer. There continues to remain, however, controversy regarding the suitability of BCT for patients with the triple-negative subtype of breast cancer. It has been proposed that due to the high local recurrence risk, total mastectomy (TM) may be the preferred approach to these patients. This study evaluates the impact of BCT vs TM on survival and recurrence in triple-negative patients.
Method: A retrospective review of patients with triple-negative breast cancer undergoing treatment between January 2004 and January 2011 in a comprehensive, multidisciplinary breast oncology program was undertaken. One hundred ninety-six patients were identified. Data collected included demographics, pathology, stage of disease, initial treatment, local recurrence, and overall survival. Patients with stage IV disease were excluded.
Results: One hundred eighty patients were included in our study population. Ninety-seven patients underwent BCT and 71 patients underwent TM. Of those patients undergoing TM, 54 received adjuvant radiation; all BCT patients received adjuvant radiation. At median follow-up of 2.5 years, LRR was seen in 12 patients--7 in the BCT group and 5 in the TM group (p = 0.8). Three of the 5 patients who recurred after TM had received radiation (p = 0.5). Median time to recurrence was 1.2 years. Overall survival was similar between the 2 groups (p = 0.1)



Conclusions: Selecting BCT does not appear to negatively impact recurrence risk or overall survival in patients diagnosed with triple-negative breast cancer. Triple-negative phenotype alone should not be a contraindication for BCT.

0084 A Breast Pain Protocol for Women With Negative Breast Imaging and Exams Can Reduce Overall Specialist Visits, Thereby Reducing Health Care Expenditure and Maintaining Quality Care

Nayomi Edirisinghe, Christine Callahan, Matthew Brown, Marta Quijano, Ronald Nath, Patrick Brophy, Kelley Cornell

Winchester Hospital, Winchester, MA, USA

Objectives: Breast pain (mastalgia) is a health concern for many women. Most cases of breast pain are benign. The goal of this study was to find the subgroup of patients that may not need a specialist evaluation for breast pain thereby reducing health care expenditure while maintaining quality.

Method: The study included 256 patients referred to the Winchester Breast Care Center between March 2010 and February 2011 with breast pain, negative clinical breast exam, and negative imaging. Negative imaging was defined as a negative bilateral diagnostic mammogram and focused ultrasound of the area of pain. The clinical breast exam was performed and found to be negative by the primary care physician. A nurse visit instituted the breast pain protocol. Our breast pain protocol encouraged patients to monitor their menstrual cycles to determine its correlation to breast pain – cyclical or noncyclical. Dietary and lifestyle changes, such as limiting sodium intake, reducing caffeine intake, and maintaining a low fat diet rich in fruits and vegetables and grains, were discussed with each patient. Patients were encouraged to maintain a healthy weight. Dietary supplements could be taken if not contraindicated. Patients were encouraged to try 1 supplement at a time consistently for 4-6 weeks to determine results. The supplements were Vitamin E, evening primrose oil (EPO), and Omega 3. Finally, relaxation techniques were discussed with patients to address breast pain that may be related to stress and anxiety. A follow-up phone call was then made by a nurse to each patient 8 weeks after instituting the protocol.

Results: Ninety-nine patients (39%) on the protocol had resolution of symptoms without any intervention. Dietary supplements such as fish oil, Vitamin E, and EPO relieved symptoms in approximately 7%, 1%, and 3% of patients, respectively. Six percent of patients (16/256) had symptom resolution after reducing caffeine intake. Five patients felt their pain was stress-induced. Sixteen patients reported their symptoms were cyclical and 10 patients noted other hormonal causes. Sixteen patients had non-breast conditions noted and returned to their primary care physician. Four patients did not have relief of symptoms and declined follow-up. Forty-four patients (17%) were lost to follow-up. Fifteen patients (6%) returned to the breast care center for specialist evaluation. With the exception of the patients lost to follow-up, no cancers were diagnosed in this group of patients.

Conclusions: A breast pain protocol with good follow-up can reduce the number of specialist visits in patients with negative exam, and negative imaging. A 94% reduction in specialist visits was noted by instituting this protocol. A mechanism to follow patients who do not respond to calls will need to be addressed.

0215 Accelerated Partial Breast Irradiation Using a Strut-Based Brachytherapy Device for the Treatment of Ductal Carcinoma In Situ of the Breast

John Einck[1], Daniel Scanderbeg[1], Robert Kuske[5], Ben Han[3], Robert Hong[2], Kerri Perry[4], Jay Reiff[6], Sudha Mahalingam[7], Michael Farmer[8], Stephen Nigh[9], John Strasser[10], Constantine Mantz[11], Jondavid Pollock[12], Catheryn Yashar[1], Yan Jiang Graves[1]

[1]University of California San Diego, San Diego, CA, USA, [2]Virginia Hospital Center, Arlington, VA, USA, [3]South Florida Radiation Oncology, Boynton Beach, FL, USA, [4]Texas Oncology and Kerri Perry, MD, Denton, TX, USA, [5]Arizona Breast Cancer Specialists, Phoenix, AZ, USA, [6]Drexel University College of Medicine, Philadelphia, PA, USA, [7]The Christ Hospital Cancer Center, Cincinnati, OH, USA, [8]Methodist Hospital and Breast Clinic of Memphis, Memphis, TN, USA, [9]Northwest Community Hospital, Arlington Heights, IL, USA, [10]Christiana Care Health System, Newark, DE, USA, [11]21st Century Oncology, Fort Myers, FL, USA, [12]Schiffler Cancer Center, Wheeling, WV, USA

Objectives: Limited data are available on the treatment of ductal carcinoma in situ (DCIS) with accelerated partial breast irradiation (APBI). The available literature suggests that these patients have low local recurrence rates using this treatment technique but patient numbers are relatively low and length of follow-up is short. As a result of this, the American Society for Radiation Oncology (ASTRO) consensus guidelines on APBI list its use on patients with DCIS as “cautionary.” We present the largest series of DCIS patients reported to date, all of whom were treated with the APBI using strut-based brachytherapy.

Method: The Strut-Based Brachytherapy Research Group (SBBRG) database was used to identify patients with DCIS at 12 institutions treated with strut-based brachytherapy for APBI. All patients had a histologic diagnosis of DCIS and received postoperative APBI to a dose of 3400 cGy in 10 fractions to the

Planning Target Volume (PTV-eval) using this device. Data on patient age and margin status, implant dosimetry, device size, disease status, and toxicity using this device were analyzed.
Results: From 2007-2011, 274 patients with DCIS received APBI using strut-based brachytherapy. Patient ages ranged from 40-87 with a median age of 62. Thirty-eight patients were under 50 years of age. Dosimetry is available on 254 patients. Overall dosimetry is excellent (median percent of target volume receiving 90% of the prescription dose was 97%, median skin dose was 104%, volume of target receiving 150% and 200% of the prescription dose was 25.1cc and 12.6 cc, respectively.) At a median follow-up of 16 months, the risk of ipsilateral "in-field" recurrence was 1.4%. There were no recurrences in the women under 50 years of age. There were 12 infections in 229 patients for whom data was available (5.2%). The incidences of grade $\geq$3 telangiectasis, fibrosis, and prolonged seroma were 0%, 3.3%, and 2.2%, respectively.
Conclusions: APBI using strut-based brachytherapy is an effective treatment for patients with DCIS. Excellent dosimetry was achieved in the majority of cases leading to low local recurrence rates and acceptably low toxicity.

0138 Reconstruction Patterns in a Single-Institution Cohort of Women Undergoing Mastectomy for Breast Cancer
Leisha Elmore[1], Carla S. Fisher[2], Terence Myckatyn[1], Feng Gao[1], Julie A. Margenthaler[1]
[1]Washington University School of Medicine, St. Louis, MO, USA, [2]University of Pennsylvania, Philadelphia, PA, USA
Objectives: Recent data suggest increasing numbers of women choosing mastectomy and contralateral prophylactic mastectomy for treatment of breast cancer. The impact of various reconstructive practices is unclear. The aim of the current study was to conduct a patient-centered investigation of reconstruction practices following mastectomy at our institution.
Method: A questionnaire was administered to patients who had undergone previous unilateral mastectomy or bilateral mastectomy for breast cancer during the years 2006 to 2010. The survey queried on demographics, surgical choices, and rationale for those choices. Patients were specifically asked about their decision to undergo breast reconstructive, the method by which they were introduced to reconstructive choices, the type of definitive reconstruction performed, and the timing of reconstruction. Descriptive statistics were utilized for data summary and were compared using chi-square tests. A p value <0.05 was considered significant.
Results: Of 310 patients queried, 175 (56%) underwent unilateral mastectomy and 135 (44%) underwent bilateral mastectomy (mean age, 56 $\pm$ 12 years), including 68 (22%) with stage IIB-III disease. Overall, 192 (62%) of women underwent breast reconstruction, which is significantly higher than reported national rates of 10-25% ($p < 0.05$), while 118 (38%) did not. Of those undergoing reconstruction, 182 (96%) reported that their surgical oncologist was the first person to discuss reconstructive options; 10 (4%) reported self-directed referral for reconstruction. Immediate breast reconstruction was performed in 125 of 192 (69%) women, while 67 of 192 (31%) underwent delayed reconstruction. The method of definitive reconstruction included 137 of 192 (71%) prostheses (tissue expander and/or implant), 36 of 192 (19%) abdominal tissue flap, 14 of 192 (7%) latissimus flap (+/- implant), and 5 of 192 (3%) with a combination of prostheses and tissue flaps. Of the 118 patients who did not undergo reconstruction, 68 (58%) reported lack of desire for reconstruction as their motive, while the remaining 50 (42%) reported either medical contraindications for reconstruction or did not report a specific reason.
Conclusions: The majority of women undergoing unilateral or bilateral mastectomy for breast cancer at our institution elect to undergo reconstruction. Prosthetic reconstruction was the most common method utilized in our cohort. The impetus for referral to the reconstructive surgeon was nearly always initiated by the surgical oncologist. Further research is needed to evaluate the impact of patient preference, provider bias, and barriers to care on the utilization of breast reconstruction nationwide.

0214 A Systematic Review of Intraoperative Imprint Cytology and Frozen Section Pathology for Margin Assessment in Breast Conservation Surgery
Karla Esbona, Lee Wilke
University of Wisconsin, Madison, WI, USA
Objectives: Achieving negative surgical margins is critical to minimizing the risk of local recurrence in breast-conserving surgery (BCS). Our objective was to perform a systematic review comparing re-excision rates, sensitivity and specificity of the intraoperative use of the surgical margin assessment

techniques of imprint cytology (IC), and frozen section analysis (FSA), against the standard of permanent section histology for breast cancer patients who underwent BCS.
Method: The databases PubMed, Web of Knowledge, Cochrane Library, and CINAHL Plus were searched from January 1997 to July 1, 2011. Original investigations in patients who underwent BCS for breast cancer which evaluated margin assessment with permanent histology and/or IC or FSA were included. Titles, abstracts, and articles were reviewed. Studies reporting re-excision rates after primary BCS using permanent section, IC, and FSA, as well as studies reporting specificity and sensitivity values for both intraoperative techniques were summarized qualitatively using the STROBE checklist for cohort studies and the SORT numerical scale for diagnostic studies. Studies from the same author with expanded patient populations were excluded to avoid duplicate patient entry.
Results: From 182 identified studies, 39 met the inclusion criteria; 19, 6, and 15 articles for permanent section, IC, and FSA, respectively. Nine studies were prospective, with the remaining delineated as retrospective. The final re-excision rates after primary BCS were 36.65%, 6.18%, and 10.03% for permanent section, IC, and FSA, respectively. For IC, re-excision rates decreased from 23.92% to 5.39% and for FSA, re-excision rates decreased from 26.57% to 5.97%. Pooled specificity of IC and FSA were 96.41% and 91.07%, respectively. The average length of each technique during BCS was 13 minutes for IC and 27 minutes for FSA.
Conclusions: Patients who underwent BCS with intraoperative IC or FSA techniques to assess negative surgical margins underwent less secondary surgical procedures. This review is limited by the provided data from selected institutions with the ability to perform on-site intraoperative pathology.

0115 The Road to Diagnosis: A Comparative Analysis of Breast Cancer Patients' Experiences Within and Outside the Safety Net
Oluwadamilola M. Fayanju, Donna B. Jeffe, Leisha Elmore, Deborah N. Ksiazek, Julie A. Margenthaler
Washington University School of Medicine, St. Louis, MO, USA
Objectives: A 2007 review of our city's Safety Net (SN) breast cancer referral process revealed that SN patients were nearly 4 times as likely as non-Safety Net (NSN) patients to have late-stage disease at diagnosis. As a result, reforms were implemented to increase screening mammography rates among SN patients and to improve the efficiency with which SN patients were referred to our city's comprehensive cancer center for definitive diagnosis and treatment. Following introduction of these reforms, we interviewed 2 groups of breast cancer patients about their prediagnostic experiences: (1) patients referred via the SN and (2) patients not referred through the SN. In this study, we hoped to obtain a better understanding of patient and process factors that were associated with late-stage breast cancer diagnosis and to determine whether these factors differed by type of referral (SN vs NSN).
Method: From September 2008 to June 2010, SN patients with new diagnoses of any-stage (0-IV) breast cancer and NSN patients with new diagnoses of late-stage (IIB-IV) breast cancer were identified prospectively during their initial consultations at our cancer center. Each patient was invited to participate in a 45- to 60-min semistructured telephone interview. Interview questionnaire data were entered using a computer-assisted telephone interview system, and narrative responses were taped and transcribed verbatim. Clinical data were obtained from medical records. Narrative data were analyzed using thematic analysis techniques; each interview transcript was reviewed and independently coded by 2 raters using inductive methods to identify themes in the data. Consensus was reached for coding discrepancies through discussion.
Results: Fifty-seven women completed interviews (SN-referred: 33/47 invited [70%], mean age, 53 [range, 30-68] years; NSN-referred: 24/35 invited [69%], mean age, 53 [range, 33-76] years). Fifty-two percent of SN-referred patients were diagnosed with late-stage disease compared with 100% of NSN patients (by design). SN and NSN patients had similar levels of health and screening knowledge and demonstrated similar levels of fear and avoidance with regards to seeking medical attention for abnormal breast findings. Compared with NSN late-stage patients, a higher proportion of SN late-stage patients discovered their cancer through an abnormal mammogram (22% vs 8%) and reported receiving timely, consistent communication from healthcare providers throughout the diagnostic period (50% vs 17%). Compared with SN early-stage patients, SN late-stage patients were more likely to report poor baseline health prior to being diagnosed with breast cancer (28% vs 0%). While SN patients often reported receipt of compassionate care once they were connected with health services, many needed extra assistance accessing and navigating the healthcare system and were often deterred by inadequate insurance coverage or limited financial resources.

Conclusions: Despite higher rates of screening mammography and positive interactions with the healthcare system, our city's SN patients continue to present with higher-than-expected rates of late-stage disease even after implementing changes in the referral process. Inadequate access to primary care, health insurance, and financial resources were reported by greater proportions of SN patients and may represent opportunities for intervention.

0057 Adherence Patterns to National Comprehensive Cancer Network Guidelines for Referral of Women With Breast Cancer to Genetics Professionals

Terri Febbraro, Katina Robison, Jennifer Scalia Wilbur, Jessica Laprise, Vrishali Lopes, Christine Raker, Michael DeSimone, Ashley Stuckey
Women and Infants Hospital/Brown University School of Medicine, Providence, RI, USA

Objectives: Genetic predisposition is responsible for 5-10% of breast cancer. The National Comprehensive Cancer Network (NCCN) established guidelines delineating appropriate candidates for genetic counseling and testing. This study aims to determine referral patterns for genetic counseling and testing of women who met NCCN referral guidelines at an academic center.

Method: Utilizing an institutional tumor registry database, patients from an academic oncology program who met a subset of NCCN guidelines for referral for genetic evaluation between 2004 and 2010 were identified. Included were those patients diagnosed with breast cancer at ≤50 years of age who had not been previously diagnosed with a BRCA mutation. A retrospective electronic chart review was conducted. Statistics were analyzed using SAS version 9.2 (SAS Institute, Cary, NC); categorical variables were compared by chi-square or Fisher exact test and continuous variables were compared by ANOVA. Logistic regression was used to calculate odds ratios and 95% confidence intervals.

Results: One hundred fifty-four patients with breast cancer were identified and 47 (30.5%) were referred for genetic counseling. The median age at diagnosis was younger for those referred to genetic counseling as compared to those women not referred (42 and 46 years of age, respectively; $p = 0.0002$). Women were more likely to be referred if there was a family history suspicious for an inherited cancer syndrome (75% vs 50%, $p = 0.007$). There was no difference in stage at diagnosis, type of insurance, or parity among those women referred and not referred. Prophylactic mastectomy was more common among those women referred for genetic counseling (56% vs 27%, $p = 0.004$). Among those patients referred, 72% consulted with a genetics counselor, 97% underwent genetic testing, and 31% were found to harbor a mutation.

Conclusions: Genetic counseling and testing is being underutilized in women who meet NCCN referral guidelines. Age and family history were noted to be predictive of referral for genetic evaluation. While referral rates appear to be increasing over time, further research is needed to determine additional factors that may impact not only referral rates but also subsequent care for women with possible genetic predispositions to cancer.

0074 Fear of Recurrence and Perceived Survival Benefit Are Primary Motivators for Choosing Mastectomy Over Breast Conservation Therapy Regardless of Age

Carla Fisher[1], Tonya Martin-Dunlap[2], Feng Gao[2], Julie Margenthaler[2]
[1]University of Pennsylvania School of Medicine, Philadelphia, PA, USA, [2]Washington University School of Medicine, Saint Louis, MO, USA

Objectives: Breast conservation therapy (BCT) provides equivalent survival outcomes to mastectomy for all women with early-stage breast cancer. Despite this, many studies have reported increases in the rate of mastectomy and contralateral prophylactic mastectomy. We have previously described patient and clinical characteristics that impact this surgical decision-making process and we found that fear over future cancer risk was a main determinant for choosing mastectomy. We further hypothesized that there would be different reasons for choosing mastectomy for women ages ≥50 and <50 at the time of their cancer diagnosis and surgery.

Method: A questionnaire was administered to 332 patients who had undergone previous unilateral or bilateral mastectomy for breast cancer during the years 2006 to 2010. The survey queried on demographics, surgical choices, and rationale for those choices. A retrospective chart review was performed to determine tumor characteristics. The distributions of the patients' opinions on mastectomy, as well as their clinical characteristics across age groups, were described by contingency tables and compared using Fisher exact test or chi-square test as appropriate.

Results: Of the 332 patients surveyed, 310 had complete clinical data and were considered evaluable. The median age of our cohort was 55 with 88 patients <50 (28%) and 222 patients ≥50 (72%) at the time of their initial evaluation. Forty-six percent of women <50 and 43% of women ≥50 were given the option of BCT and chose mastectomy ($p > 0.63$). The 2 groups also did not differ in their reason for choosing mastectomy, with lower recurrence risk and improved survival cited as the 2 most common reasons. Younger patients, however, were significantly more likely to undergo breast reconstruction as well as contralateral prophylactic mastectomy ($p < 0.0001$). Most young women who chose contralateral mastectomy cited "preventative," were unaware of a "genetic abnormality" as their reason. Younger women were more likely to be estrogen receptor negative, undergo neoadjuvant chemotherapy, and MRI was more commonly used in their preoperative evaluation ($p < 0.05$).
Conclusions: In our study, choosing mastectomy and reasons for doing so were the same for women ≥50 and <50. While fear of a future cancer was expressed equally by both groups, younger women were more likely to also elect to undergo a contralateral mastectomy as a prophylactic measure. Prospective studies are needed to determine whether patient education regarding perceived vs actual recurrence risk would alter this decision-making process.

0180 Does Breast Density Affect the Ability of MRI to Detect Mammographically Occult Cancers?
Beth C. Freedman, Jocelyn Luongo, Alyssa Gillego, Tamara Fulop, Kwadwo Boachie-Adjei, Susan K. Boolbol
Beth Israel Medical Center, New York, NY, USA
Objectives: In newly diagnosed breast cancer patients, the use of preoperative breast MRI is increasing. A change in the operative plan as a result of MRI findings occurs in 8 to 20% of cases. Though MRI is used routinely by many surgeons and radiologists as an adjunct to mammography and ultrasound, debate persists with regard to its indications. We undertook this study to evaluate whether mammographic breast density affected MRI findings. We also examined whether the number of MRI-detected synchronous cancers were affected by the density of breast tissue**.**
Method: A retrospective chart review was performed of patients with newly diagnosed breast cancers who underwent preoperative MRI from 2008-2011. There were 3 categories of breast density: fat-replaced, scattered fibroglandular densities, and dense. We then determined the number of patients in each group who underwent biopsies based on MRI findings, and evaluated the number of occult cancers diagnosed as a result of these biopsies.
Results: The study group consisted of 302 patients. In total, 64 patients (21%) who underwent an image-guided biopsy based on preoperative breast MRI were diagnosed with an additional focus of cancer. Of the 18 patients with fat-replaced breasts, 4 underwent an additional biopsy, and carcinoma was identified in all 4 patients. One hundred forty-nine patients had scattered fibroglandular densities, of whom 53 (36%) underwent additional biopsies. New cancers were diagnosed in 28 patients (19%). The group of patients with dense breasts underwent the largest percentage of image-guided biopsies after MRI. Of 135 patients, 61 patients (45%) had additional biopsies, and new cancers were diagnosed in 24% of patients with dense breasts.

Table 1.

Breast Density (n = 302)	**No. of Patients Who Underwent Biopsy (%)**	**No. of Patients With New Cancer (%)**	**No. of Patients With High-Risk Lesions (%)**	**No. of Patients With Benign Biopsy Results (%)**
Fat replaced (*n* = 18)	4 (22.2%)	4 (22.2%)	0	0
Scattered fibroglandular densities (*n* = 149)	53 (35.6%)	28 (18.8%)	8 (5.4%)	17 (11.4%)
Dense (*n* = 135)	61 (45.2%)	32 (23.7%)	8 (5.9%)	21 (15.6%)

Conclusions: MRI detected additional cancer in 21% of patients who underwent preoperative imaging. MRI is sensitive and specific in patients with fat-replaced breasts (100%), but due to the small number of patients in this group, additional studies must be done to evaluate the usefulness in this group of patients. We conclude that MRI is a useful tool for detecting additional cancers in patients of all breast densities,

and may influence the surgical options of the patient when multicentric or contralateral disease is diagnosed.

0239 Giant Abdominal Mass: A Unique Presentation of Metastatic Malignant Phyllodes Tumor of the Breast

Garrett Friedman[1], Arthur Celestin[2], Sharon Lum[2], Mark Reeves[2]
[1]Boston University School of Medicine, Boston, MA, USA [2], Loma Linda University Medical Center, Loma Linda, CA, USA,

Objective: Phyllodes tumors represent less than 1% of all breast tumors. Metastasis from malignant phyllodes tumors (MPT) of the breast is exceedingly rare. We present a case report of metastatic MPT presenting as a giant abdominal mass.

Method: A case report and literature review of MPT of the breast was performed.

Results: A 55-year-old woman presented with a 3-month history of increased abdominal girth, early satiety, and difficulty walking because of the weight of the abdominal mass. The patient had a prior history of a right breast "phyllodes tumor with foci of malignant transformation" at a referring institution 3 years previously and had undergone right partial mastectomy, with pathology showing positive margins. She did not undergo re-excision and did not receive any adjuvant chemotherapy or radiation. CT scan demonstrated a 24.7-cm x 20.3-cm well-circumscribed mass arising from the region of the transverse colon and greater omentum. Solitary lung and lumbar spine metastases were identified. There was no evidence of local breast recurrence. Ultrasound-guided biopsy of the abdominal and right lung masses revealed a malignant spindle cell neoplasm which stained negatively for CD117 (c-KIT), CD34, Desmin, S100, and CD68, but focally positive for SMA. Review of pathology slides of her previously excised phyllodes tumor confirmed a diagnosis of metastatic phyllodes tumor, as the tumors were morphologically identical. Palliative resection of the abdominal mass was performed. The tumor weighed more than 13 kg. Final pathology showed metastatic high-grade sarcoma, consistent with metastatic MPT of breast. Postoperatively, the patient did well and was discharged home. Literature review revealed only 2 reported cases of small bowel metastasis from MPT of the breast, and no other cases of an intra-abdominal metastasis.

Conclusions: This report demonstrates that inadequate resection of MPT of the breast can be associated with extensive metastasis and poor prognosis. When necessary, re-excision should be performed and negative margins confirmed, especially in the case of malignant pathology.

0244 Imaging Modalities in the Early Onset Breast Cancer Patient

Kara Friend, Eric Feliberti, Rebecca Britt, Jay Collins, Roger Perry, Jennifer Reed
Eastern Virginia Medical School, Norfolk, VA, USA

Objectives: Mammography is one of the key modalities in diagnosis of breast cancer but there is a paucity of data relating to mammographic assessment of tumor size in the early-onset (under age 40) breast cancer population. This study analyzes the accuracy of tumor size estimation by mammography and breast MRI in this population.

Method: All female patients aged 18 to 40 diagnosed with breast cancer at a single institution between 2000 and 2010 were evaluated. Patients who did not undergo treatment or who received neoadjuvant chemotherapy were excluded. Pathologic tumor size was compared to the size estimated by mammography and MRI. Data was stratified to determine the effect of race and tumor size on tumor size estimation by imaging.

Results: Of the 78 patients who met inclusion criteria, 41 were Caucasian, 31 were African American, and 6 were Asian. The mean underestimate of pathologic size for mammography was 1.0 cm (range, -1.9 to 7.5 cm) whereas MRI was 0.9 cm (range -2.3 to 7.5 cm). When subdivided by race, the Caucasian population underestimated pathologic size by 1.2 cm (mammography) and 1.1 cm (MRI). For Asian patients, imaging tended to overestimate size with mammography average 0.6 cm larger than the actual tumor and MRI averaging 0.8 cm larger. The African American population showed the greatest disparity between mammography and MRI, underestimating by 0.8 cm and 1.4 cm, respectively. When evaluated by size of the tumor, the biggest errors were noted in the 3 cm or greater primaries with error rates of 3.0/2.6 cm (mammography/MRI) for Caucasians and 2.2/2.9 cm for African Americans.

Conclusions: Mammography is a valid method for evaluating breast cancer in the younger population. Mammography and MRI are comparable in the Caucasian population but show considerable variation in the African American population. Additionally both imaging modalities overestimate the size of Asian

patients' tumors, though this may be related to the small patient- sample size. Both methods are valid for estimation of tumor size, but it should be recognized that there are significant differences in the accuracy of the estimates based on race.

0072 ACOSOG Z0011 Changing Behavior: Results of a Survey of The American Society of Breast Surgeons

Sarah Gainer[1], Kelly Hunt[1], Peter Beitsch[2], Abigail Caudle[1], Elizabeth Mittendorf[1], Anthony Lucci[1]
[1]The University of Texas MD Anderson Cancer Center, Houston, TX, USA, [2]Dallas Surgical Associates, Dallas, TX, USA

Objectives: Results from the recently published American College of Surgeons Oncology Group (ACOSOG) Z0011 trial demonstrated no difference in overall survival or local-regional recurrence rates for patients with ≤2 positive sentinel lymph nodes (SLNs) randomized to axillary lymph node dissection (ALND) vs no further surgery. All patients enrolled on Z0011 had clinical T1-2N0 tumors and underwent breast-conserving therapy to include whole-breast irradiation (WBI). The current study was undertaken to evaluate the impact of the Z0011 data on surgical practices across the country.

Method: A 7-question survey was sent by electronic mail to 2759 members of The American Society of Breast Surgeons (ASBS). Four questions assessed clinical practice type and duration, familiarity with the Z0011 data, and mode of dissemination of Z0011 results. Three additional questions assessed preferences for management of patients with ≤2 positive SLNs if the patients were to receive WBI, accelerated partial breast irradiation (APBI), or no irradiation.

Results: A total of 849 (30.8%) responses were received; 635 (74.8%) from surgeons in private practice and 214 (25.2%) in academic practice. The majority (97%) of respondents were familiar with the Z0011 data. The source of Z0011 trial results were: American College of Surgeons (ACS), ACOSOG, or American Society of Clinical Oncology (ASCO) press release (38.1%), the original article (27.5%), tumor board (8.8%), the *New York Times* article (4.5%), a lay press article (4.2%), or other source (16.9%). In respondents familiar with the data, 468 respondents (56.9%) would infrequently or never perform ALND on a woman with ≤2 positive SLNs planned to receive WBI, while 186 (22.6%) would sometimes perform ALND and 168 (20.4%) would perform ALND most or all of the time. Two hundred seventy-nine (36%) surgeons would sometimes, infrequently, or never perform ALND on a woman with ≤2 positive SLNs planned to receive APBI. In addition, 218 (26.6%) would sometimes, infrequently, or never perform ALND on a patient with ≤2 positive SLNs who was not planned to receive WBI. There was no difference between academic and private practice patterns with regard to use of ALND in patients with ≤2 positive SLNs.

Conclusions: Findings of the ACOSOG Z0011 trial have resulted in a change in surgical practice with regard to use of ALND after a positive SLNB. The majority of surgeons responding to the survey do not plan to routinely perform ALND in women with ≤2 positive SLNs when they are planned for WBI. Importantly, the ACOSOG Z0011 trial did not examine alternative radiation techniques beyond WBI. Our study shows that one quarter of respondents considered omitting ALND in patients with ≤2 positive SLNs who will not be receiving WBI. Omission of ALND in the setting of mastectomy or APBI use was not studied in Z0011 and requires further evaluation.

0123 Breast Cancer Screening in an Inner-City Outreach Breast Clinic

Mary Gemignani[1], Michelle Sampson[1], Michelle Azu[2], Anne Eaton[1], Sujata Patil[1], Laura Liberman[1]
[1]Memorial Sloan-Kettering Cancer Center, New York, NY, USA, [2]UMDNJ-Robert Wood Johnson Medical School, Cancer Institute of New Jersey, New Brunswick, NJ, USA

Objectives: To evaluate factors associated with breast cancer stage at diagnosis and surgical treatment in women diagnosed with breast cancer at the Breast Examination Center of Harlem (BECH), an inner-city outreach breast cancer screening program.

Method: We performed retrospective chart review of women diagnosed with breast cancer at BECH during 2000-2008. Demographic, clinical, pathologic, and surgical treatment and follow-up were abstracted. The Wilcoxon rank-sum test and Fisher exact test were used for comparison of groups; Kaplan-Meier analysis was used for overall survival.

Results: BECH performed an average of 8,944 screening mammograms per year (range, 8,106-10,813). Our study group consisted of 339 women whose screening led to a cancer diagnosis. Median age at diagnosis was 54 years (range, 23-97). Fifty-six percent of the women were black, 39% Hispanic, and 5% other. Fifty-two percent of the women had no insurance. Hispanic women were significantly more likely to

have no insurance compared with black women ($p < .001$). The majority of the women in our study group, 281 of 334 patients with data available (84%), had had at least 1 prior screening mammogram before diagnosis. The most common presentation was abnormal imaging in 55% of women; 43% had abnormal imaging and a palpable mass, and 2% a palpable mass only. The median time from presentation to biopsy or surgery was 35 days (range, 0-5034 with 25th and 75th percentiles of 20 and 57, respectively). We did not find an association between either race or insurance and time interval from abnormal finding to biopsy or surgery. The most common method of diagnosis was percutaneous biopsy in 89% of the women. Median tumor size was 1.5 cm (range, 0.1-10.0).
The median time interval from biopsy to first surgery was 42 days (range, 0-294). The majority of the patients had a lumpectomy (67%). Sentinel node biopsy was performed in 134 women (40%), axillary node dissection was performed in 106 (32%), and 95 (28%) had no axillary procedure. Pathologic stage was available for 328 patients (Table 1).

Table 1.

Stage	0	I	II	III	IV
N (%)	95 (29%)	120 (36%)	78 (24%)	33 (10%)	2 (1%)

Thirty-two of these patients died, with a median follow-up for survivors of 1.6 years (range, 0.0-8.5). Nineteen patients refused treatment; reasons for refusal were not known. Of the patients who were alive, almost 40% of the entire group was followed for less than a year. Median follow-up for survivors was slightly higher among Black women, 1.8 years (range, 0.0-8.1 years). In this subset of 188 women, overall survival at 5 years was 0.79 (95% confidence interval, 0.68-0.87).
Conclusions: Women at BECH are predominantly black, and 48.4% of them have insurance. We did not find an association between race/ethnicity or insurance and time interval from abnormal finding to biopsy or surgery. The median time interval was 35 days. Because BECH is predominantly a screening center, we were not able to obtain adequate data on adjuvant therapy, such as chemotherapy, hormonal therapy, or radiation therapy. We noted that although the majority of patients in our study were stage 0-I (66%), the overall survival was low. The impact of treatment, follow-up, and refusal of treatment factors in this inner-city population with breast cancer warrants further investigation.

0254 Race Not a Factor in Overall Survival in Patients With Triple-Negative Breast Cancer: A Retrospective Review

Katherine Glover-Collins, Athena Starlard-Davenport, Issam Mahkoul, Laura Hutchins, Kent Westbrook, Soheila Korourian, Kimberly Enoch, Michael Preston, Kenneth Gardner, V. Suzanne Klimberg, Ronda Henry-Tillman
University of Arkansas for Medical Sciences, Little Rock, AR, USA

Objectives: The goal of this review was to evaluate treatment outcomes, recurrence, and overall survival of patients with triple-negative breast cancer.
Method: In an IRB-approved retrospective study, 93 patients with triple-negative breast cancer diagnosed between 1999 and 2007 were identified. Overall survival (OS) rate was estimated using the Kaplan-Meier product-limit method and compared between groups using the log-rank test. Cox proportional hazards ratios were for each survival outcome to determine the association of patient and variables with clinical outcome.
Results: In this IRB-approved retrospective review, a total of 93 women with triple-negative breast cancer were evaluated for overall survival after diagnosis. Thirty-four patients (36.8%) were black, and 60 patients (63.2%) were white. Of women diagnosed with stage 1 breast cancer, the overall survival rates for blacks was 100% compared to whites at 92.3% (hazard ratio [HR] = 0.0; 95% CI, 0.003 to 19; P = 0.5). For women with stage 2 breast cancer, overall survival for black women was 72% and for white women was 69% (HR = 0.8; 95% CI, 0.26 to 2.6; P = 0.73). For advanced stages of breast cancer (stages 3 and 4), overall survival for black women was 54% and 22% for white women (HR = 0.6; 95% CI 0.2-1.975; P = 0.43).
Conclusions: This study indicates that race has no significant effect on overall survival for women diagnosed with triple-negative breast cancer. This is in contrast to previous studies which indicate African American women have a poorer overall survival when diagnosed with triple-negative breast cancer.

0124 Should Immunohistochemical Markers Be Performed on the Surgical Specimens Rather Than the Core Needle Biopsy in Breast Cancer Patients?

Lauren Greer[1,2], Martin Rosman[2], W. Charles Mylander[2], Jeffrey Hooke[1], Albert Kovatich[1], Joan Woodward[2], Janet Wareham[2], J. Leigh Campbell[1], Wen Liang[2], Robert Buras[2], Lorraine Tafra[2], Craig Shriver[1]

[1]Walter Reed National Military Medical Center, Bethesda, MD, USA, [2]Anne Arundel Medical Center, Annapolis, MD, USA

Objectives: Breast tumor heterogeneity, defined as distinct areas within single or multiple ipsilateral tumor(s) with either different histologic presentations on H&E or significant biomarker discrepancies (some leading to molecular subtype changes), may be present in up to 10% of breast cancer patients. Biomarkers from core needle biopsies (CNB) of the primary tumor may not be representative of the entire surgical specimen (SS) in heterogeneous tumors. Our aim is to investigate the level of concordance between the CNB and the SS in heterogeneous tumors.

Method: A retrospective review of a prospective study was performed on women diagnosed with breast cancer from January 2009 to June 2011. Subjects treated with neoadjuvant therapy were excluded. Tumor type, grade, ER, PR, HER2, Ki67 expression by IHC were analyzed in the CNB and SS. Subjects with tumor heterogeneity were identified (at least 2 samples of IHC markers performed per subject). Molecular subtypes were determined by IHC markers. Contingency tables and agreement modeling were performed for heterogeneous subjects.

Results: Tumor heterogeneity was identified in 13 (32 samples) of 189 subjects. Eight subjects had histologic differences on H&E and 5 had significant biomarker discrepancies allowing initial classification of heterogeneity. Tumor size ranged from 2 mm to 7 cm. One patient was noted to have 4 distinct molecular subtypes within the same tumor. There was substantial agreement between the CNB and SS for histologic grade; moderate agreement for PR%; fair agreement for tumor type, and Ki67%; and slight agreement for HER2 (see Chart). A kappa value could not be generated for ER% since there were no ER negatives in the CNB. Five subjects had areas of their tumors that stained positive for HER2, which was not detected in their CNB. Three subjects had areas in their SS that were negative for ER and PR, but stained positively in their CNB.

Surgical Specimen (*n*)

Core Needle Biopsy (*n*)				Kappa (κ)	Landis-Koch Agreement Grade
Tumor Type	*IDC*	*ILC*	*Mixed*	0.22	Fair
IDC	17	0	4		
ILC	0	3	0		
Mixed	6	1	1		
Histologic Grade	*1*	*2*	*3*	0.66	Substantial
1	2	1	1		
2	1	8	1		
3	0	2	14		
ER %	*Negative (<1%)*		*Positive (≥1%)*	N/A	N/A
Negative (<1%)	0		0		
Positive (≥1%)	5		27		
PR %	*Negative (<1%)*		*Positive (≥1%)*	0.42	Moderate
Negative (<1%)	3		0		
Positive (≥1%)	6		23		
HER2	*Negative (0/1+/2)*		*Positive (3+)*	0.14	Slight
Negative (0/1+,2+ FISH-)	21		6		
Positive (3+/2+ FISH+)	3		2		
Ki-67 %	*Low: ≤ 14%*		*High: > 14%*	0.32	Fair
Low: ≤ 14%	5		1		
High: > 14%	6		10		

Conclusions: Tumor heterogeneity in invasive breast cancer is difficult to identify on H&E alone in the SS and not routinely detected in CNB. The accuracy of biomarkers on the CNB of heterogeneous tumors is not always representative of the biology of the whole tumor(s). Since many heterogeneous tumors are detected by biomarkers alone in the SS, possibly reserving immunohistochemical staining only for the SS would allow a more cost-effective and tailored treatment of breast cancer patients.

0104 Gender Differences in Breast Cancer: Analysis of 13,000 Male Breast Cancers From the National Cancer Data Base

Jon Greif[1,4], Christopher Pezzi[2], Suzanne Klimberg[3], Lisa Bailey[1,4], Marlene Zuraek[4]
[1]Bay Area Breast Surgeons, Inc., Oakland, CA, USA, [2]Abington Memorial Hospital, Abington, PA, USA, [3]University of Arkansas, Little Rock, AR, USA, [4]Alta Bates Summit Medical Center, Oakland, CA, USA

Objectives: It has been more than a decade since the National Cancer Data Base (NCDB) was analyzed to compare male to female breast cancer.[1] This update examines gender differences in demographics, tumor characteristics, treatments, and outcomes.

Method: All patients with breast cancer entered in the NCDB from 1998 through 2007 were compared for differences in gender, and then for age, race/ethnicity, histology, grade, tumor size, lymph node involvement, hormone receptor status, course of first treatment, and overall survival. Statistical significance was determined by chi-square test and odds ratio (OR) for categorical variables and by nonparametric test for continuous variables. Survival rates were calculated using the Kaplan-Meier method and compared by log-rank test. Statistical significance was set at p less than or equal to 0.05.

Results: Thirteen thousand four hundred fifty-seven cases of male breast cancer were identified, representing 0.9% of all breast cancers, and compared to 1,439,866 female breast cancers. Males with breast cancer were more often African American (11.7 vs 9.9%; OR, 1.19), less often Hispanic (3.6 vs 4.5%; OR, 0.74), and older (63 vs 59 years old). Males had larger tumors (median, 20.0 vs 15.0 mm), were less likely to have grade 1 tumors (16.0 vs 20.7%), were more likely to have lymph node metastasis (41.9 vs 33.2%; OR, 1.45), and more likely to have distant metastasis (4 vs 3; OR, 1.39). Males were less likely to have lobular carcinoma (10 vs 18%; OR, 0.51) and more likely to be estrogen receptor positive (88.3 vs 78.2%; OR, 2.10) and progesterone receptor positive (76.8 vs 67.0%; OR, 1.63). Males were less likely to have a partial mastectomy (33 vs 62%; OR, 0.31) and less likely to receive radiation (35.9 vs 50.4%; OR, 0.55). All of these differences were highly statistically significant ($p < 0.0001$). Because of the large number of cases, however, differences which achieved levels of statistical significance may not be of clinical significance. There was no statistically significant difference in chemotherapy rates (40.1 vs 39.8%; OR, 1.01, $p = 0.40$) and only small differences in hormonal therapy rates (41.2 vs 42.4%; OR, 0.95, $p = 0.006$). Differences in overall survival (OS) were highly statistically significant ($p < 0.0001$) for all patients by gender: 83% 5-year OS for women with breast cancer (median survival, 129 months) vs 74% for men (median survival, 101 months). When OS was compared by stage, females with breast cancer had highly statistically significantly improved 5-year OS ($p < 0.0001$) for stage 0 (94 vs 90%), stage I (90 vs 87%), and stage II (82 vs 74%) breast cancer. There were no differences in 5-year OS for stage III (56.9 vs 56.5%, $p = 0.99$) or stage IV (19 vs 16%, $p = 0.20$).

Conclusions: This large comparative study re-examines male and female breast cancer to compare patient demographics, tumor characteristics, treatments, and outcomes, and demonstrates that men lag behind women in overall survival rates for early-stage breast cancer.

1. Scott-Connor CEH, Jochimsen PR, Menck HR, Winchester DJ. An analysis of male and female breast cancer treatment and survival among demographically identical pairs of patients. *Surgery.* 1999; 126:775-781.

0248 An Analysis of Ipsilateral vs Contralateral New Breast Primary Following Breast-Conserving Therapy

Christine Gresik, Firas Eladoumikdachi, Ali Shidfar, Kalie Tommerdahl, Irene Helenowski, Julie Franz, Seema Khan
Northwestern University, Chicago, IL, USA

Objectives: Increasing mastectomy rates (ipsilateral and bilateral) over the past decade may relate to patient concerns regarding disease recurrence. Recently, it has been suggested that contralateral prophylactic mastectomy may improve survival, but analyses are limited by small numbers of contralateral new primaries. Since breast conservation is acknowledged as safe therapy for early-stage breast cancer, we sought to identify the prognostic differences between patients with an ipsilateral new primary (INP) vs those with a contralateral new primary (CNP) following therapy for an index breast cancer.

Method: We retrospectively analyzed the records of patients undergoing breast conservation between 1984 and 2011 and identified patients with a second breast malignancy at least 1 year following their index tumor. We then distinguished the INP from the true recurrences (TR) if the new tumor was located more than 3 cm from the index tumor bed or was located in a different quadrant of the breast. Log-rank analysis was used to examine differences in event rates and survival following diagnosis of the second primary tumor.
Results: A total of 82 CNP were compared to 89 INP; median follow-up time, 220 months (range, 14.5 to 268.4 months). There was no significant difference between the 2 groups with regard to tumor size, histology, or hormone receptor status. Median time from index tumor to new primary disease was 5.0 years for the CNP group vs 4.2 years for the INP group (P = .18). Locoregional recurrence showed no significant differences between the groups; 8 events for INP and 8 events for CNP (P = .88). Distant disease-free and overall survival events for INP (6 and 8); CNP (3 and 8) (P = .40). Combined locoregional and distant events totaled 14 for the INP and 11 for the CNP group.
Conclusions: These data reaffirm the notion that women who undergo breast conservation and develop new primary tumors are at similar (and low) risk for subsequent events following the second primary, whether it is ipsilateral or contralateral.

0092 Does Infrared Thermography Predict the Presence of Malignancy in Patients With Suspicious Radiologic Breast Abnormalities?
Cara Marie Guilfoyle, Abigail E. Collett, Moira K. Christoudias, Andrea V. Barrio, Thomas G. Frazier
Bryn Mawr Hospital, Bryn Mawr, PA, USA
Objectives: The NoTouch BreastScan (NTBS) is a noninvasive nonradiation-based imaging tool that measures and compares thermal abnormalities in breasts using dual infrared cameras and computer analysis. The NTBS generates a score reflective of blood flow patterns based on the theory of tumor angiogenesis. We evaluated NTBS screening as a predictor of breast cancer in patients undergoing minimally invasive breast biopsy for suspicious mammogram, ultrasound, or MRI findings.
Method: Following IRB approval, 181 female patients with 187 abnormal radiologic findings were prospectively evaluated from October 2009 to May 2011. Each patient had an NTBS prior to tissue biopsy. Final tissue pathologies were compared to corresponding NTBS scan results. Each breast was interpreted as positive or negative, based on computer analysis of thermal abnormalities. The contralateral breast was scanned in all patients. Prior to October 15, 2010, patients were initially scanned using a “high specificity” mode termed NTBS1. Subsequently a “high sensitivity mode,” termed NTBS2, was used to minimize false-negative results. Following initial data analysis, all patients were retrospectively re-evaluated in the NTBS2 mode. We are reporting both sets of results.
Results: Of the 181 patients prospectively evaluated, 3 patients were excluded due to a non-ductal or lobular breast malignancy, for a total of 178 patients. Fifty patients had 52 positive breast biopsies and 128 patients had 132 negative biopsies. Of the 52 positive biopsies, only 26 had a positive NTBS (sensitivity 50%). The sensitivity of NTBS was lower in the 20 in situ cancers compared with the 32 invasive cancers (35% vs 59%, respectively). Of the 132 negative biopsies, 88 showed a negative NTBS scan (specificity 67%). The positive predictive value of NTBS was 37% and the negative predictive value was 77%. One hundred seventy-three normal contralateral breasts were scanned; 42 (24%) had a positive NTBS scan. Of the 178 patients retrospectively evaluated using NTBS2, 22 were excluded secondary to an uninterpretable scan, resulting in a total of 156 patients. Forty-four patients had 46 positive breast biopsies and 112 had 116 negative biopsies. Of the 46 positive biopsies, 40 had a positive NTBS (sensitivity, 87%). There was no appreciable difference in sensitivity between in situ and invasive cancers in the NTBS2 mode (88% vs 86%, respectively). Of the 116 negative biopsies, 55 showed a negative NTBS (specificity, 48%). The positive predictive value of NTBS2 was 40% and the negative predictive value was 90%. One hundred fifty-one normal contralateral breasts were scanned; 72 (47%) had a positive reading.
Conclusions: NTBS does not accurately predict malignancy in women with radiologic abnormalities requiring biopsy. The higher sensitivity mode (NTBS2) results in an unacceptable number of false positives, precluding its use. Infrared screening cannot be used as a successful adjunct to mammography, nor can it replace any of the screening modalities that are standard practice. Mammography remains the gold standard for breast cancer screening.

Table 1. Clinical Characteristics of 181 Patients Undergoing NTBS Followed by Minimally Invasive Biopsy

Total number of radiologic abnormalities	187
Median age at diagnosis (years)	52.5
Radiologic abnormalities, n (%)	
Calcifications	77 (41%)
Mass[a]	104 (56%)
Abnormal enhancement	5 (3%)
Diffuse skin thickening	1 (<1%)
Type of biopsy, n (%)	
Stereotactic	90 (48%)
Ultrasound guided	73 (39%)
MRI guided	7 (4%)
Biopsy without image guidance [b]	13 (7%)
No target [c]	4 (2%)

NTBS, NoTouch BreastScan.
[a] Includes patient with architectural distortion seen on mammogram
[b] Includes fine needle aspiration and core biopsy
[c] Target lesion not identified on day of biopsy

0012 The Use of MRI vs USS in Assessing Axillary Lymph Nodes in Patients With Confirmed Breast Cancer

Shradha Gupta, Rajeshkumar Balasubramanian, Musa Barkeji
West Middlesex University Hospital, Isleworth, Middlesex, UK

Objectives: Axillary lymph node status is a crucial prognostic factor in determining long-term outcome for patients with breast cancer and its staging is vital to plan appropriate management.
Currently in England, axillae are routinely imaged for suspicious nodes using ultrasound scanning (USS) and if positive they undergo axillary clearance. This study aims to determine whether MRI scanning can increase the accuracy of detecting positive lymph nodes to avoid multiple procedures to the axilla.
Method: A retrospective database of patients with breast cancer presenting to a district general hospital between 2008 and 2010 was compiled containing patient demographics, histology and grade of cancer types, staging of cancer on MRI and USS, and lymph node biopsy results. The 2 imaging modalities were directly compared to each other against histology results and analysed for sensitivity, specificity, and predictive values.
Results: Eighty-eight clinical episodes were identified, of which 12 were excluded due to incomplete histology. The remaining 76 episodes were analysed. The USS detected 53 normal axillae and 23 suspicious axillae (including 10 indeterminate); sensitivity was 50%, specificity 89%; positive predictive value 82.6%, negative predictive value of 64%. The MRI detected 46 normal axillae and 30 suspicious axillae (including 11 indeterminate). MRI sensitivity was 65%; specificity, 86%; positive predictive value, 83%; negative predictive value, 71.7%.
Conclusions: Currently USS detection of the axillary lymph nodes is undertaken in the first instance to identify positive lymph nodes amenable to USS-guided biopsy. SLNB is more sensitive and specific for identifying metastatic disease and is therefore the gold standard, however, it is an invasive process and a further axillary node clearance will be required if positive. MRI offers the practical benefit of imaging bilateral breasts and axillae in 1 scan. Our results showed that MRI was as sensitive and specific as USS in detecting positive lymph nodes, therefore there was no additional benefit in using MRI scan for the assessment of axillae.

0141 Pathologic Response to Neoadjuvant Chemotherapy for the Treatment of Breast Cancer in a Predominantly African American Patient Population

Tal Hadar[1], Ann Amukele[1], Lana Bijelic[1], Mihriye Mete[2], Marc Boisvert[1]
[1]Center for Breast Health, Washington Cancer Institute, Washington Hospital Center, Washington, DC, USA, [2]Department of Biostatistics and Epidemiology, MedStar Health Research Institute, Hyattsville, MD, USA

Objectives: Neoadjuvant chemotherapy is considered the standard of care for the treatment of locally advanced breast cancer. Pathologic complete response (pCR) to neoadjuvant chemotherapy is

associated with improved survival. The rate of pCR varies in different studies, and depends on patient, tumor, and treatment factors. Our institution serves a unique patient population with a majority of African American patients.
The aim of our study is to determine patient and tumor characteristics associated with pathologic complete response to neoadjuvant chemotherapy in a population of predominantly African American women.
Method: We performed a retrospective data review of patients who underwent neoadjuvant chemotherapy for breast cancer between the years 2000 and 2010. Demographic information, tumor stage at presentation; ER, PR and HER-2 receptor status; chemotherapy regimen; surgical procedure; and pathologic response of the tumor to therapy were collected and analyzed using chi-square tests and *t* tests, as appropriate.
Results: A total of 167 patients were included in the study. One hundred twenty-six (75%) of them were African American. There was no significant difference between African Americans and non African Americans in terms of age at diagnosis (53.5 and 53 years, p = 0.83), mean tumor size (4.13 and 3.97cm, p = 0.73), lymph node involvement at diagnosis (75.2% and 78%, p = 0.71), invasive ductal carcinoma histology (86.8% and 90.2%, p = 0.83) or rate of breast conservation (53.2% and 56.1%, p = 0.74). The incidence of triple-negative breast cancer was significantly higher in African American patients compared to all other ethnicities (44.8% vs 19.5%, p = 0.004). Thirty-five of 167 patients (21%) achieved pCR. The rate of pCR was 22.2% in African Americans and 17.1% in patients of other ethnicities (p = 0.32). The rates of pCR were not significantly different between patients with triple-negative and receptor-positive tumors within the African American patient group (23.1% and 18.8%, p = 0.36). None of the variables – age, tumor size, histologic type or chemotherapy regimen – was found to be a significant predictor of pCR.
Conclusions: In our study, there was no significant difference in the rate of pathological complete response to neoadjuvant chemotherapy between African American and non-African American women with breast cancer despite a higher rate of patients with triple-negative tumors among African Americans. The response rates were comparable to rates previously described in the literature. No single patient or tumor characteristic was found to be a predictor of pCR.
The decision regarding neoadjuvant chemotherapy for breast cancer should not be based on patients' ethnicity, but rather on specific patient and tumor characteristics.

0258 Local Anesthetic Delivery Systems Can Improve Pain Control in Selected Mastectomy Patients

Esther Han[2], Nathalie Johnson[1], Katherine Morris[1], Margie Glissmeyer[1]
[1]Legacy Cancer Institute, Portland, OR USA, [2]Oregon Health and Sciences University, Portland, OR, USA

Objectives: Local anesthetic delivery systems (LADS) can be used in patients undergoing mastectomy to reduce postoperative pain and narcotic requirements. There is limited nonindustry-sponsored literature assessing their efficacy in this setting. The aim of this study was to determine if LAD use in patients undergoing mastectomy led to decreased inpatient pain scores and narcotic use.
Method: IRB approval was obtained. Records of all women undergoing mastectomy during 2005-2008 at a tertiary care community-based cancer center were evaluated for inclusion. Patients were stratified by unilateral vs bilateral operations and whether or not they had immediate reconstruction (RECON). Median pain scores (0-10) and narcotic use for patients receiving pain pumps were compared to those who did not have pain pumps by *t* test. Narcotic use was confirmed by review of both pharmacy medication release and nursing administration records. Different narcotics were compared by converting them into their equivalent dose of morphine sulfate (MS).
Results: Four hundred twenty-nine patients were identified; 423 charts were available for review. Patients with PCAs (n = 13, 8 with LAD) were excluded due to unavailable dosage data, leaving 410 patients in the study. Median age was 54 (range, 26-92). Two hundred ninety-eight received LAD (Pump) and 112 (No pump) did not. Mean age and stage were not significantly different between the 2 groups. The median inpatient pain score for postoperative days (POD) 0 and 1 was 2.5, indicating good pain management for the entire group. Median total MS equivalent dose over that time was 32.6 mg. However, for patients without reconstruction there was improvement in pain control with the LAD (see Table 1).

Table 1.

	Recon N = 200				No recon N = 210			
	Pump N = 172		No pump N = 28		Pump N = 126		No pump N = 84	
	Uni N = 60	Bi N = 110	Uni N = 16	Bi N = 12	Uni N = 74	Bi N = 52	Uni N = 72	Bi N = 12
Median POD 0-1 Pain Score (0-7.7)	3		3.54		**1.44*** P = 0.01		2	
Median MS equivalent POD 0-1 (0-582)	2.83	3.2	3.5	3.54	**1.27*** P = 0.01	1.5	2	2.5
Median MS equivalent entire hospital stay / LOS (0-291)	56.7		50		**10*** P < 0.01		20.3	
	37.2	69	40.8	52.3	**6*** P < 0.01	**15.5*** P = 0.04	19.8	40.8
	27.5		26.1		**5*** P < 0.01		10.6	
	18.6	37.4	22.3	28.4	**3*** P < 0.01	**9.5*** P = 0.02	10	25
Median LOS (1-10)	**3*** P = 0.02		2		**3*** P < 0.01		2	
	3	3	2	3	3	3	2	2

Conclusions: In mastectomy patients who did not have reconstruction, the use of LAD was associated with statistically significant less pain and narcotic use and the pain pump should be considered in this subset. In patients having reconstruction, there was no significant reduction in reported pain or decrease of narcotic use associated with the LAD.

0137 Sexual Dysfunction, Depression, and Quality of Life in Breast and Gynecologic Cancer Survivors: A Prospective Evaluation

Emily Hill[1], Jennifer Gass[1], Christina Raker[1], Sandra Carson[1], Doreen Wiggins[2], C.O. Granai[1], Elizabeth Spriggs[1], Don Dizon[1]

[1]Women & Infants Hospital, The Warren Alpert Medical School of Brown University, Providence, RI, USA, [2]The Center for Obstetrics and Gynecology, Providence, RI, USA

Objectives: To characterize quality of life, sexual function, and depressive symptoms in female cancer survivors evaluated in a specialized program for sexual health. We also describe the effect of follow-up visits on these parameters.

Method: Female cancer survivors seen in the Women & Infants' Women's Oncology Center for Sexuality, Intimacy and Fertility clinic from February 2006 to August 2011 were prospectively assessed at new and follow-up visits with 3 questionnaires: the Female Sexual Function Index (FSFI; score range, 2-36), the European Organization for Research and Treatment of Cancer Quality of Life (QOL) Core Questionnaire (QLQ-C30; range, 0-100) and the Beck Depression Inventory (BDI; range, 0-63). Higher scores on the FSFI and BDI reflect greater dysfunction, while on the QLQ-C30 global QOL and functional scales reflect less dysfunction. These data were then analyzed in conjunction with demographic and medical history data. Statistics were generated using Stata v10.

Results: There were 66 unique cancer patients seen in 114 clinic visits (66 new, 48 follow-up). Median age was 49.4 years (range, 26-64). Breast cancer survivors comprised 39.4% of patients with the other 61.6% were mainly gynecologic cancer survivors. Prior cancer treatment included surgery (92%), chemotherapy (63%), and/or radiation (56%). Significant sexual dysfunction was present at baseline (mean FSFI = 10.5; range, 1.2-26.3), but this was not associated with poor quality of life (mean global

QOL = 70.7; range, 0-100). Women did have evidence of mild to moderate depression at baseline (mean BDI = 11.4; range, 0-33). Breast cancer patients trended toward having less depression, less sexual dysfunction, and higher QOL when compared to gynecologic patients, but this was not statistically significant. Simple interventions in the clinic included validation of symptomatology, counseling, lubricants, topical pharmaceuticals (both hormonal and nonhormonal), and vaginal self-dilation. Women who were seen in follow-up visits showed improvement in FSFI domains for arousal (P = 0.05), satisfaction (P = 0.002), and total FSFI score (P = 0.03) (Table 1). Severity of depression on follow-up visits was significantly lower (OR, 0.4; P = 0.009). Global QOL scores remained stable.

Table 1. Change in Instrument Scores Following Treatment

Instrument	Mean Baseline Score	Mean Change on Follow-up (95% CI)	P value
BDI	11.4	-2.1 (-4.6-0.4)	0.1
FSFI total	10.5	3.9 (0.4-7.5)	0.03
FSFI arousal	1.7	0.6 (-0.01-1.2)	0.05
FSFI satisfaction	1.8	0.9 (0.3-1.5)	0.002
QLQ-30 global QOL	70.7	-0.6 (-7.6-6.4)	0.9

Conclusions: Female cancer survivors referred to a sexual health clinic demonstrate significant sexual dysfunction and mild to moderate depressive symptoms but with preserved global quality of life. Our study is the first to prospectively assess these domains in women with cancer who refer to a sexual health program and demonstrates improvement in sexual function on follow-up visits, highlighting the need to address sexual concerns among breast and gynecologic cancer survivors.

0026 Experience With I-125 Seed Localization in a Community Hospital-Based Breast Center

Ching Ho, Semele Foundas, Susan Weinberg
Bethesda North Hospital, Cincinnati, OH, USA

Objectives: The purpose of this study was to detail the barriers encountered and overcome in developing a successful radioactive seed localization program (RSL) in a large community breast center. The decision was made to transition from a wire to seed localization program when our breast center moved from the hospital to a free-standing building. The wire procedure is cumbersome and transit of patients from one building to another raised the possibility of wire displacement. Upon review of pertinent literature, the potential benefits of RSL became clear. The seed procedure could provide greater flexibility in surgical scheduling, placement of surgical incisions, and might potentially decrease the incidence of positive margins in surgical specimens, thus decreasing repeat operating room visits, procedural costs, and patient inconvenience and anxiety.

Method: We first reviewed Ohio State's Nuclear Medicine license. An amendment to the hospital's state license was required to allow off-label use of I-125 to perform RSL procedures. Once this license amendment was secured, a team, including the breast radiologist, surgeon, and pathologist, met to discuss the potential barriers to the RSL program. The significant barriers are education and mentoring of more than 20 physicians and technologists in the program. In-services were conducted for the appropriate specialties, and a radiation oncologist who had experience with radioactive seed placement was employed to monitor 3 cases for each physician, a requirement defined by the State of Ohio. The radiation oncologist monitored 3 RSL procedures by the chief radiologist's placement the seed, followed by monitoring the chief breast surgeon's seed handling and removal in the operating room. Finally the specimens were followed in the pathology department to monitor the pathologist's assessment of the surgical specimens. Once the primary radiologist, breast surgeon, and pathologist were approved, they agreed to mentor physicians in their own specialty. This was carried out for 9 radiologists, 7 surgeons, and 3 pathologists. The seed localization study was performed over the first 12 months and compared retrospectively with needle localization data 12 months prior to initiation of the program.

Results: Seven participating surgeons of whom 3 were full-time breast surgeons participated in this study. Altogether 185 needle localization (NL) cases were compared to 167 radioactive seed localizations (SL). The negative margin rates were 52.7% (NL) vs 66.6% for the SL procedure. Two cases required a second specimen to locate the seed during the first 3 months of this SL study. In 2 cases, the radioactive seeds were separated from the specimen but were easily recovered during the surgery.

Conclusions: In sum, the seed localization procedure was adopted by the center as its standard of care. All lesions were removed at the time of surgery and we have observed a reduced positive margin rate for malignant lesions. Our study acknowledges that there are barriers to overcome when transitioning from WL to a RSL program. These potential barriers are best addressed with careful planning.

0087 Analysis of the Impact of Intraoperative Margin Assessment With Adjunctive Use of MARGINPROBE® vs Standard of Care on Tissue Volume Removed: Results From a Randomized Prospective Multicenter Study

Dennis Holmes[1], Lorraine Tafra[2], MarginProbe Study Group[3]
[1]Los Angeles Center for Women's Health, Los Angeles, CA, USA, [2]Anne Arundel Medical Center, Annapolis, MD, USA, [3]Margin Probe Study Group, Framingham, MA, USA

Objectives: The standard of care (SOC) of breast-conserving surgery (BCS) involves intraoperative margin assessment according to gross assessment, surgeon's judgment, and specimen imaging. The failure of this intraoperative assessment has been associated with a 20% to 40% reoperation rate to ensure negative margins. MARGINPROBE (Dune Medical Devices, Framingham, MA) was developed to provide real-time assessment of lumpectomy specimens to evaluate for the presence of disease at the surgical margins. A 21-center international pivotal study was conducted to determine if adjunctive use of MARGINPROBE can enhance surgeons' ability to identify positive margins intraoperatively, resulting in fewer patients who require re-excision procedures. We sought to analyze the impact of device use on tissue volumes removed to achieve clean margins.

Method: Six hundred sixty-four women with nonpalpable lesions undergoing lumpectomy for DCIS and invasive cancer were enrolled and 596 randomized (1:1) in the operating room following SOC lumpectomy. In the device arm, MARGINPROBE was used to assess all surfaces of the lumpectomy specimen and positive readings required resection of each affected margin. All specimens in both arms were examined by intraoperative imaging to verify excision of the target lesion. All lumpectomy and re-excision specimens were submitted to the pathologists, who were blinded to study arm. Positive margins identified following pathological assessment were re-excised at another operation per individual site criteria. Patients were followed for 2 months following surgery; additional procedures were documented.

Results: The breakdown of tissue volume removed is shown in Table 1. Device use resulted in a significant reduction in the number of candidates for re-excision [D: 42/298 (14.1%), C: 98/298 (29.9%), 57% reduction, $p < 0.0001$]. Overall total tissue volumes between the 2 groups were similar, with an 8.5-cc difference corresponding to a 2.6% difference in breast volume when normalized to bra cup size. In the primary lumpectomy, there was a small increase in tissue volume removed as a result of an increase in detection of positive margins (true positive) and false-positive device readings when compared to control (15.6 cc and less than 2 shavings per patient). For patients who required a second surgery to achieve clean margins, less tissue was removed in the device arm (28.4 cc), as compared to the control arm (49.5 cc).

Table 1. Tissue Volume Removed

Average per Patient	Control	Device	Difference
Initial surgery			
Main specimen	61.3	59.7	-1.6
True-positive shavings	2.7	6.7	4.0
False-positive shavings	7.7	21.1	13.4
Total volume	71.9	87.5	15.6
Re-excision surgeries			
Tissue volume	49.5	28.4	-21.1
Normalized tissue volume (normalized to breast volume)	5.6%	4.0%	-1.6%
All surgeries			
Total tissue volume	84.8	93.3	8.5
Normalized total tissue volume (normalized to breast volume)	12.5%	15.1%	2.6%

Note: All entries in cc unless noted otherwise.

Conclusions: Cosmesis is affected by multiple variables, including the need for re-excision surgery, as well as the amount of tissue removed. Use of MARGINPROBE was associated with a significant reduction in candidates for re-excision, and a small amount of overall additional tissue volumes removed. Patients in the device group who required re-excision needed to have less tissue removed. Because this difference is so minimal, the impact of device use on cosmesis should be negligible, and many patients will benefit by not requiring multiple surgeries.

0135 Predictors of Quality of Life 1 Year After Biopsy for Breast Cancer

Skyler Johnson[1], Janet Osuch[1], Bruno Giordani[2], Adrian Blow[1], Pam Haan[1], Michael Boivin[1]
[1]Michigan State University, East Lansing, MI, USA, [2]University of Michigan, Ann Arbor, MI, USA

Objectives: The overreaching outcome of breast cancer treatment is patient satisfaction with medical care and resulting quality of life (QoL). Addressing mood, deepness of spiritual beliefs, and cognition can leave lasting impressions on women's perceptions of their treatment experiences and potentially optimize the healing process. We investigated the predictors of QoL in women 1 year following treatment for breast cancer.

Method: Women diagnosed with breast cancer (invasive or ductal carcinoma in situ, treated with breast preservation) and controls with benign biopsies were recruited prospectively. Measures included the Hope Quality of Life Scale, Bottomley Social Support Scale, PhQ-9 Patient Health Questionnaire, National Comprehensive Cancer Network Distress Management Screening Measure, Spiritual Involvement & Beliefs Scale, and self-reports of Cognitive Functioning and Fatigue. Analysis of covariance (age, education, income as covariates) compared treatment group (control, no chemotherapy, chemotherapy) on overall QoL. Multiple regression analyses investigated the predictive value of age, income, education, treatment, mood, social support, level of distress, cognitive appraisal, fatigue, spirituality on overall QoL, with analyses of predictors of QoL subscales included.

Results: Eighty-five women with breast cancer (32 requiring chemotherapy) and 67 with benign biopsies were studied. Average age was 65.8 years (range, 30–88; sd, 8.7). ANCOVA demonstrates a significant main effect for treatment group ($p < .0001$). Higher QoL was demonstrated in controls compared with no-chemotherapy ($p < .003$) and chemotherapy ($p < .0001$) groups, as well as for the no-chemotherapy compared to the chemotherapy group ($P < .02$). Regardless of group, a main effect for time ($p < .04$) was significant, with higher QoL scores reported at both 4 months and 1 year, compared to the time of biopsy (both $p < .03$). Higher overall QoL 1 year postbiopsy was predicted ($R^2 = 0.71$) by older age ($p < .04$), income above \$30K ($p < .003$) and \$75K ($p < .03$), lower reported distress ($p < .0001$), increased spiritual beliefs ($p < .0001$), and lower depression ($p < .006$). QoL subscales analysis demonstrated that higher spiritual QoL was predicted ($R^2 = 0.67$) by increased spiritual belief ($p < .0001$), lower depression ($p < .008$), and needing chemotherapy ($p < .01$). Higher social Qol was predicted ($R^2 = 0.65$) by lower distress ($p < .0001$), not needing chemotherapy ($p < .0001$), and not having a cancer diagnosis ($p < .0001$). Higher psychological QoL was predicted ($R^2 = 0.53$) by older age ($p < .01$), income above \$30K ($p < .03$), lower distress ($p < .0001$), and lower depression ($p < .01$). Higher physical QoL was predicted by ($R^2 = 0.71$) older age ($p < .005$), income above \$30K ($p < .01$) and \$75K ($p < .02$), lower distress ($p < .0001$), lower depression ($p < .0001$), not having cancer ($p < .0001$), and reporting less fatigue ($p < .01$).

Conclusions: For all 3 groups, QoL improved 1 year following biopsy, although QoL was highest in control patients and lowest in patients receiving chemotherapy. Patients needing chemotherapy reported lower overall QoL, but turned more toward spirituality to cope with their illness.

0077 Stage and Presentation of First Breast Cancer Are Associated With Stage and Presentation of Metachronous Breast Cancer

Manuela Junqueira, Anne Eaton, Shirin Muhsen, Kara Koss, Michelle Stempel, Sujata Patil, Monica Morrow
Memorial Sloan-Kettering Cancer Center, New York, NY, USA

Objectives: Bilateral breast cancer is an infrequent occurrence, yet many women choose to undergo bilateral mastectomy to avoid a second cancer. The purpose of this study was to investigate the experience of a single large cancer center comparing tumor features in metachronous breast cancers (MBC).

Methods: We identified 325 patients treated for MBC between 1990 and 2006. MBC was defined as invasive cancer or DCIS occurring bilaterally with a minimum interval of 6 months between diagnoses. Medical records were reviewed and tumor features were recorded for both cancers (C1 and C2).

Differences in proportions between C1 and C2 features were tested using McNemar's or Bowker's tests for correlated data. Associations where the 2 tumors were assumed to be independent were tested using Fisher exact or chi-square tests. Tumor feature and nodal status comparisons were performed on the subset of 212 patients with 2 invasive cancers.
Results: Median age at C1 diagnosis was 52 y (range, 21-84), 28% had a first-degree relative with breast cancer, and 17 were known BRCA mutation carriers. Median follow-up from C1 was 12.8 y, median time between diagnoses was 3.9 y (range, 0.5-13.5). Ninety-two percent of C2 occurred without local recurrence from C1 or distant metastasis. C2 presented initially as a palpable mass less often than C1 (23% vs 42%; $p < .001$); 79% of patients with an initially image-detected C1 presented with an image-detected C2, while only 64% of palpable C1 presented as image-detected C2 ($p = .007$). The frequency of invasive and in situ cancers did not vary significantly between C1 and C2 (invasive C1, 78%; C2, 81%; $p = .25$). Eighty-four percent of patients with an invasive C1 developed an invasive C2, while 72% of women with an in situ C1 developed an invasive C2 ($p = .04$). The stage of C1 was strongly predictive of the stage of C2 ($p < .001$). In patients with stage 0-II C1, the rate of stage III/IV C2 was 5% vs 32% among patients with stage III/IV C1. Likewise, a T1/T2 C1 was associated with a T1 C2 in >80% of cases, while only 42% of women with a T3/4 C1 had a T1 C2 ($p = .001$). Similar relationship was observed regarding nodal status: N0/N1 C1 was followed by N0 C2 in >70% of cases, while N2/3 C1 presented as N2/3 C2 in 50% of cases ($p < .001$). Multifocality of C1 did not predict multifocality of C2 ($p = .48$), and histology of C1 did not predict histology of C2 ($p = .08$). ER status of C1 was strongly predictive of ER status of C2 ($p < .001$) among patients not receiving endocrine therapy for C1; this trend was not significant among patients on endocrine therapy.
Conclusions: This study suggests that poor prognostic features of the initial cancer, including detection by palpation, large size, and nodal metastases, are predictive of an increased likelihood of these features in a second cancer, despite patients being part of the medical system. Examination of biologic features responsible for this may allow the development of tailored surveillance strategies.

0175 Outcome Predictors of Microinvasive Breast Cancer
Nimmi Kapoor[1,2], Jaime Shamonki[1], Jeong Yoon[1], Cathie Chung[1], Armando Giuliano,[1,2]
[1]John Wayne Cancer Institute, Santa Monica, CA, USA, [2]Cedars Sinai Medical Center, Los Angeles, CA, USA
Objectives: There is limited data on the long-term outcome of patients with microinvasive breast cancer. Moreover, predictors of lymph node involvement and the impact of multifocal microinvasion are not well understood. We examined the occurrence of nodal involvement and the impact of multifocal disease on recurrence.
Methods: After IRB approval, patients with T1mic breast cancer, defined as tumors ≤1 mm, who were surgically managed at our institute between 1995 and 2010 were identified from our prospective database. Slides were independently reviewed to confirm tumor stage and number of foci of microinvasion. Patients were excluded if they had prior breast cancer or neoadjuvant chemotherapy. Variables evaluated to predict lymph node involvement and disease recurrence were patient age; in situ tumor size; occurrence of comedonecrosis; grade of in situ component; 1 or more foci of microinvasion; ER, PR, and HER2 status of the invasive component; and surgical intervention. A multivariable model was designed to identify significant variables.
Results: Fifty-two patients with T1mic breast cancers were identified. Median patient age was 53 (range, 30-92), median size of in situ disease was 3 cm (range, 0.1-12 cm). Ten patients (19.2%) had more than 1 focus of microinvasion (range, 2-7). Median size of in situ component tended to be greater in tumors with multifocal microinvasion than in single-focus microinvasion (6 cm vs 2 cm, $p = 0.1$). The majority of tumors had comedonecrosis and/or high-grade in situ disease (76.9%). Thirty-one of 40 tumors (77.5%) were ER/PR receptor positive, 38.9% were HER2+ (14/36), and only 1 was ER-/PR-/HER2-. Thirty patients (57.7%) underwent breast conservation surgery and 22 underwent mastectomy. Lymph nodes were assessed in 48 patients; there was 1 macrometastasis (2.1%), 4 micrometastases (8.3%), and 4 (8.3%) with isolated tumor cells. The patient with the macrometastasis had 5 cm of high-grade DCIS and 3 foci of microinvasion that were ER-/PR-/HER2-. Univariable analysis showed that negative ER status of invasive disease and high-grade DCIS tumors were more likely to have any involved lymph nodes. On multivariable analysis only negative ER status was a significant predictor of lymph node metastasis ($p < 0.02$). At median follow-up of 83 months (range, 6-172 months), 3 patients (6.3%) had disease recurrence (1 local, 1 distant, 1 local and distant) at 8 months, 17 months, and 11 years from initial diagnosis and 1

had a contralateral breast cancer develop. All patients with recurrence had negative lymph nodes initially and only 1 focus of microinvasion. No factors predicted disease recurrence, and macrometastasis was seen in only 1 patient.
Conclusions: Microinvasive breast cancer clearly has the ability to metastasize and recur, but in this series only 1 out of 48 patients developed a nodal macrometastasis. Moreover, at 7-year median follow-up, the few patients with disease recurrence neither had involved lymph nodes initially nor multiple foci of microinvasion. The evaluation of lymph nodes in microinvasive breast cancer may be unnecessary in the majority of patients, and neither lymph node status nor multifocal microinvasion predicts recurrence.

0102 Immediate Clinical and Imaging Assessment of Sentinel Nodes - A Pilot Study
Cary Kaufman[1,2], Laurie Hill[2], Rebecca Caro[3], Sid Nix[3], John Szenasi[3], Carol Mahon[3], Karen Ness[3], Nancy Schnell[3]
[1]University of Washington, Bellingham, WA, USA, [2]Bellingham Regional Breast Center, Bellingham, WA, USA, [3]Bellingham Surgery Center, Bellingham, WA, USA
Objectives: Sentinel node biopsy is an integral part of many forms of cancer surgery, yet the intraoperative assessment of resected nodes with frozen section or touch prep is time-consuming. The value of intraoperative sentinel node evaluation is important for the presence of macrometastases and multiple positive lymph nodes. Gross clinical assessment of axillary nodes has been unreliable and intraoperative digital imaging has only recently become available. We investigated combining clinical assessment with the use of intraoperative digital nodal x-ray to predict the presence of positive sentinel nodes for breast cancer. We compared combined (a) clinical+imaging assessment, (b) imaging alone, and (c) frozen section as predictive methods of sentinel node positivity.
Method: Consecutive invasive breast cancer patients who were candidates for sentinel node biopsy (SNB) were evaluated with gross clinical examination, intraoperative digital x-ray, as well as intraperative touch prep or frozen section. Each resected specimen was examined and 2 orthogonal digital images obtained within minutes of excision. Independent evaluation by surgeon and radiologist was provided on each specimen. The surgeon utilized gross clinical findings with the imaging evaluation while the radiologist only utilized the images. Surgeon and radiologist independently graded each patient as to whether there were metastases or not. Each was blinded to the other's opinions as well as any intraoperative pathology data. This was followed by the pathologist using touch prep/frozen section as well as permanent sections. Surgeon and radiologist impressions were compared to pathologists' intraoperative assessment, as well as the final pathology H&E report.
Results: There were 50 consecutive breast cancer patients who underwent SNB between February and November 2011. Of these, final H&E results found 35 negative-node patients and 15 positive-node patients. Of the positive nodes, 11 were macrometastases and 4 were micrometastases. Intraoperative touch prep or frozen section found 9 of 11 macrometastases (82% sensitivity) but only 1/4 of the micrometastases (overall sensitivity 67%). In addition, all 35 negative nodes were predicted by frozen/touch prep (100% specificity). Using intraoperative gross clinical exam and imaging, surgeons predicted 9 of 11 macrometastases (82% sensitivity), but none of the micrometastases. Similar gross clinical and imaging assessment identified 32/35 negative SLB (91% specificity). Imaging alone predicted 8/11 macrometastases (73% sensitivity) and 2 of 4 micrometastases. Using imaging alone, radiologists identified 22/35 negative SLB (63% specificity). Combined gross clinical and imaging assessment was comparable to frozen section results in sensitivity (60% vs 67%) and specificity (91% vs 100%).
Conclusions: Immediate intraoperative sentinel node evaluation using both clinical and imaging modalities was equally successful in identifying sentinel nodes with macrometastases as frozen section (each 82% sensitive) with 92% specificity. This pilot study supports a new rapid and inexpensive method of predicting the presence of macrometastases in sentinel nodes. Further studies are suggested for this rapid yet inexpensive method.

Both Macro- and Micro-metastases

	Frozen	Clinical + Imaging	Imaging Alone	Final Pathology
Positive (n)	10	9	10	15
Negative (n)	35	32	22	35
Sensitivity (%)	67%	60%	67%	
Specificity (%)	100%	91%	63%	

Macrometastases ONLY

Positive (n)	9	9	8	11
Negative (n)	38	36	24	39
Sensitivity (%)	82%	82%	73%	
Specificity (%)	97%	92%	62%	

Frozen Assessment ONLY

Positive (n)	10	9	8	
Negative (n)	40	37	25	
Sensitivity (%)		90%	80%	
Specificity (%)		93%	63%	

0156 Entry Level vs Desired Level of Quality Surgical Breast Care: Results of 4 Measures from the NQMBC-Surgeon Database

Cary Kaufman[1,2], Lillie Shockney[3], Jeffrey Landercasper[4], Barbara Rabinowitz[5], J. Beau Askew[6], Quality Committee[7]

[1]University of Washington Department of Surgery, Bellingham, WA, USA, [2]Bellingham Regional Breast Center, Bellingham, WA, USA, [3]Johns Hopkins Avon Foundation Breast Center, Baltimore, MD, USA, [4]Gundersen Lutheran Surgery Clinic, LaCrosse, WI, USA, [5]Creative Solutions, Southport, NC, USA, [6]Houston NW Hospital Breast Center, Houston, TX, USA, [7]National Consortium of Breast Centers, Warsaw, IN, USA

Objectives: Many quality measures have been described for breast cancer care yet widespread adaption has been uneven nationally. Reasons include the wide variation of clinical and geographic environments and as well as lack of specific target levels of quality care applicable for all situations. Each quality measure requires identification of an entry level of performance ("quality threshold") below which level medical care is either unacceptable or requires an explanation for low performance. To foster improvement beyond minimally acceptable care, each quality measure should also target an achievable higher quality level of care promoting quality improvement ("quality goal"). We report on 4 breast surgery quality measures with defined "quality thresholds" and "quality goals" from the National Quality Measures for Breast Centers (NQMBC) from 2005 to 2011.

Method: The NQMBC-Surgeon is a website program that obtains quality data from individual and groups of breast surgeons, collates and returns refined data for comparisons and improvements. Results provide levels of performance and percentile rankings for each quality measure. The 4 questions reviewed here are: (1) time from needle/core biopsy to initial breast cancer surgery, (2) frequency of use of needle/core biopsy rather than open surgical biopsy, (3) use of sentinel node biopsy in clinically stage 1 invasive breast cancer patients, (4) frequency of re-excision or mastectomy after initial breast conservation surgery. We've defined an entry- level "quality threshold" as performance at the 10th percentile level and our "quality goals" as the 50th percentile level. We also evaluated results of a random 6-month time period, choosing January to June 2007 to determine whether this sample would demonstrate improvement over time. We also looked at how demographic data influenced performance (number of cancers seen, geographic location, and size of city).

Results: Table 1 shows results of 1,993 data entries, each including approximately 30 consecutive patients. The results of the 50th percentile and 10th percentile of the 4 quality measures were: (1) time between needle/core biopsy and initial cancer surgery was 17 days and 28 days; (2) needle/core biopsy rate was 89% and 53%; (3) use of sentinel node in stage 1 patients was 89% and 52%; and (4) re-excision rate for breast-conserving surgery was 19% and 41%. The comparison of the January to June 2007 sampling was remarkably similar to the entire database. In addition, there were some demographic variations in all 4 measures comparing high and low performers related to the numbers of cancers seen per year, their geographic location in the country, and the size of the city.

Conclusions: Data obtained from the NQMBC-Surgeon database on 4 quality measures provide entry threshold levels of care above which all surgeons should perform ("quality threshold"). To continuously improve care, an achievable higher quality level of care promoting quality improvement ("quality goal") is also identified. Relationships of improved performance to demographic data are described. Further studies will be needed to determine whether establishing specific targets will achieve desired improvements in quality or whether there are other intrinsic issues to address.

Table 1. **All Data 2005 - 2011**

	"Quality Threshold" 10th Percentile	25th Percentile	"Quality Goal" 50th Percentile	75th Percentile	90th Percentile	Individual Data Entries*
Timeliness (d)	28	22	17	13	9	701
Needle Bx (%)	53	74	89	98	100	742
Sentinel node (%)	52	77	89	100	100	310
Re-excision (%)	41	29	19	9	4	240

Total: 1,993

*Average 30 patients per entry.

Data from January - June 2007

	10th Percentile	25th Percentile	50th Percentile	75th Percentile	90th Percentile	Individual Data Entries*
Timeliness (d)	26	21	17	14	10	58
Needle Bx (%)	50	75	87	98	100	56
Sentinel node (%)	47	68	88	97	100	23
Re-excision (%)	36	30	15	7	5	20

Total: 157

*Average 30 patients per entry.

0269 Smaller Margin Index Is Predictive of Residual Cancer on Reexcision

Anne Kieryn, Catherine Kelly, Irene Wapnir
Stanford, Stanford, CA, USA

Objectives: Re-excisions for close or involved tumor margins has been the subject of controversy in the breast-conserving literature for several decades. The vast majority of re-excision procedures result in finding no residual cancer. Margenthaler et al[1] have proposed margin index as a simple method to predict the likelihood of finding residual disease and, therefore, as a tool to guide surgeons and patients on the need of additional surgery.

Method: We retrospectively reviewed the pathology reports of women undergoing re-excision after initial lumpectomy for invasive breast cancer performed by a single surgeon. Cases with DCIS or LCIS at the margins or with a large DCIS component were excluded. Tumor size and size of narrowest margin were recorded. Margins measuring <1 mm were designated a numerical value of 0.5 mm and involved margins as 0.05 mm. Margin index was calculated as: size of closest margin (mm)/greatest tumor diameter (mm) x 100. Residual tumor was recognized only if it were invasive.

Results: Ninety-four invasive breast cancer cases were identified between 6/2004 and 10/2011. Eleven were excluded for DCIS/LCIS at the margin. The remaining 83 cases were reviewed for tumor size, margins, and residual invasive tumor found at re-excision. The Margenthaler et al[1] formula for the margin index was then applied. We had 33 cases with positive margins; of those, 13 had residual tumor or re-excision (39.4%). All of the selections with positive margins had a margin index <1, hence the cases with residual tumors were also <1. The remaining 50 cases with close margins had 6, wherein residual tumor was located on the re-excision (12%). We found 4 cases with a margin index <1, 2 of which had residual tumors found (50%); 24 with an index from 1 to <5 with 2 positive for tumors on second surgery (8%); and 22 with an index ≥5, 2 with re-excision tumors (9%).

Conclusions A margin index of "1" clearly defines a subset of patients with 40-50% chance of harboring residual cancer whether the primary lumpectomy margins were involved with tumor or had close margins. Whether eliminating cases with a significant DCIS component or enlarging the sample size can enhance the predictive value and reliability of margin index calculation will need to be explored further.

0178 Are Bilateral Mastectomy Rates Among Older Women Rising Due to Preoperative Breast MRI?

Brigid Killelea[1,2], Anees Chagpar[1,2], Jessica Long[2,3], Pamela Soulos[2,3], Xiaomei Ma[2,4], Cary Gross[2,3]
[1]Department of Surgery, Yale University School of Medicine, New Haven, CT, USA, [2]Cancer Outcomes Policy and Effectiveness Research (COPPER) Center, Yale Comprehensive Cancer Center and Yale School of Medicine, New Haven, CT, USA, [3]Section of General Internal Medicine, Department of Internal Medicine, Yale University School of Medicine, New Haven, CT, USA, [4]Department of Epidemiology and Public Health, Yale University School of Medicine, New Haven, CT, USA

Objectives: The use of breast MRI has risen among younger women. While concern about the association between MRI and bilateral mastectomy in this population has been expressed, the degree to which MRI has diffused into the management of older women with breast cancer is unclear. We sought to examine this trend and to determine if the association between MRI utilization and mastectomy rates was maintained in a contemporary elderly population.

Method: Data from SEER-Medicare was used to identify a population of women with breast cancer diagnosed from 2000 through 2007. Patients who underwent breast MRI within 6 months prior to surgery were identified, and compared to those who did not have MRI. Medicare claims were used to identify MRI and surgery type.

Results: Of 55,550 total patients, 4,058 (7.3%) underwent preoperative breast MRI during the study period. The use of breast MRI increased steadily, from 0.6% in 2000 to 22.0% in 2007 ($p < .0001$) This increase was more pronounced between the years 2003 and 2007. During the time period 2003-2007, those who underwent MRI were slightly more likely to undergo breast- conserving surgery (BCS) compared to women who did not undergo MRI (61.1% vs 58.7%, $p = .003$). However, when women undergoing mastectomy were considered, those who had an MRI were almost 3 times more likely to have a bilateral mastectomy than a unilateral mastectomy, compared to those who did not have an MRI (11.9% vs 4.1%, $p < .0001$).

	MRI	No MRI	P value
Total Mastectomy	1474	12,476	p < .0001
Bilateral Mastectomy	175 (11.9%)	516 (4.1%)	
Unilateral Mastectomy	1299 (88.1%)	11,960 (95.9%)	

Conclusions: The use of preoperative breast MRI has increased dramatically among older women, and is associated with an increased rate of bilateral procedures among those opting for mastectomy. The ultimate benefit of MRI and the associated more extensive surgery in this older population has yet to be established.

0184 The Effect of Computer-Aided Detection (CAD) on Breast Biopsy and Breast Cancer Detection in a Medicare Population

Brigid Killelea[1,2], Anees Chagpar[1,2], Jessica Long[2,4], Rong Wang[2,3], Xiaomei Ma[2,3], Cary Gross[2,4]
[1]Department of Surgery, Yale University School of Medicine, New Haven, CT, USA, [2]Cancer Outcomes Policy and Effectiveness Research (COPPER) Center, Yale Comprehensive Cancer Center and Yale University School of Medicine, New Haven, CT, USA, [3]Department of Epidemiology and Public Health, Yale University School of Medicine, New Haven, CT, USA, [4]Section of General Internal Medicine, Department of Internal Medicine, Yale University School of Medicine, New Haven, CT, USA

Objectives: As the use of CAD has disseminated into clinical practice, there are concerns that CAD is associated with a higher rate of biopsy without an accompanying increase in cancer detection. We sought to examine the effect of CAD on the rate of biopsy and the detection of breast cancer in a recent sample among women age 66 and over.

Method: The SEER program covers approximately 26% of the U.S. population. Using Medicare's 5% sample in SEER regions, we assembled a cohort of women who were ≥66 years of age and free of breast cancer at the end of 2007. We used algorithm-based claim codes to identify the use of mammogram and CAD, subsequent biopsy, and the incidence of breast cancer during 2008-2009.

Results: Among the 122,995 women in this study, the mean age was 77.0 years (standard deviation, 7.9). The cohort was 82.8% white, 7.3% black, and 9.9% other. During a 2-year period, 47,245 (38.4%) underwent mammography, and CAD was used in 34,629 (73.3%) of those mammograms. The use of CAD was associated with a lower rate of subsequent biopsy in the 6 months following mammography

compared to those without CAD (2.5% vs 3.0%, p < .0001). Similarly, the rate of breast cancer diagnosis was lower in the CAD group (0.9% vs 1.2%, p < .0001).

Mammogram Type	CAD	N	Biopsy in Subsequent 6 mo	P value	Cancer Diagnosis	P value
Any	CAD	34,629	871 (2.5%)		315 (0.9%)	
	No CAD	12,616	376 (3.0%)	p < 0.0001	147 (1.2%)	p < 0.0001
Diagnostic	CAD	3,568	484 (13.6%)		188 (5.3%)	
	No CAD	3,028	585 (19.3%)	p < 0.0001	218 (15.7%)	p < 0.0001
Screening	CAD	32,238	590 (1.8%)		207 (0.6%)	
	No CAD	11,634	202 (1.7%)	p < 0.0001	82 (0.7%)	p < 0.0001

Conclusions: The use of CAD is associated with a lower biopsy rate; and while it may be speculated that this technology reduces the false positive rate of mammography, the proportion of biopsies resulting in a diagnosis of breast cancer was also lower for the CAD group, calling into question its utility in finding relevant disease.

0160 Depression Associated With Goserelin (Zoladex®) in Premenopausal Breast Cancer Patients: Preliminary Study

Jiyoung Kim, Jeonghui Lee, Seung Pil Jung, Jinyoung Park, Bora Kang, Won Ho Kil, Jeong Eon Lee, Seok Jin Nam
Samsung Medical Center, Seoul, Republic of Korea

Objectives: LHRH agonists (goserelin) have been shown to be effective adjuvant therapies for hormonal receptor-positive early-stage breast cancer with good tolerance except menopausal-like adverse events. However, there were several reports about goserelin-related depressive symptoms in endometriosis treatment. The purpose of this study was to investigate the prevalence of depression and to evaluate its influence on quality of life in premenopausal early breast cancer patients with goserelin treatment.
Method: All women who underwent operation for newly diagnosed breast cancer in a single institution between September 1, 2007, and August 31, 2009, were included if they were premenopausal with positive hormonal receptor, received goserelin (3.6 mg depot subcutaneously every 28 days for 2 years) as adjuvant treatment, and had not received previous systemic therapy with no evidence of metastatic disease. They finished entire goserelin treatment but not exceeding 1-1/2 years from the date of last administration to minimize a recall bias. The data were collected through a questionnaire survey, which was composed of 5 type questionnaires, including the Hospital Anxiety and Depression Scale (HADS), the Insomnia Severity Index (ISI), the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30), the Breast Cancer-specific Quality of Life Questionnaire (EORTC QLQ-BR23), and the Menopause Rating Scale (MRS). Among 90 eligible women, 73 women agreed to participate in the study and got the questionnaire by mail or e-mail.
Results: Among 73 women who agreed to participate, a total of 37 patients completed and returned the questionnaires to the investigator (return rate = 50.7%). Clinically significant levels (defined as HADS-A/HADS-D ≥ 8) of anxiety and depressive symptoms were found in 32.4% and 29.7% of patients, respectively. The prevalence of insomnia (defined as an ISI score ≥ 11) was 37.8%. Compared to the normative reference, study participants reported clinically meaningful lower global health status/QoL, emotional, cognitive and social functioning, body image, and future perspective, as well as higher levels of fatigue, insomnia, financial difficulties, and breast cancer-specific symptoms. Patients with depressive symptoms represented higher MRS scores.
Conclusions: Breast cancer patients who were treated with goserelin experienced considerable depression, anxiety, and insomnia and poorer health-related quality of life compared to those who did not receive the goserelin treatment. When clinicians treat breast cancer patients with goserelin, early detection and intervention of mood disorders should be considered.

0207 Does Every Patient With Breast Cancer Need a Sentinel Lymph Node Biopsy?

Heather King[1,2], Don Dizon[1,2], Ashley Stuckey[1,2], Patricia Spencer[1,2], Michele Lomme[1,2], Christina Raker[1,2], Jennifer Gass[1,2]

[1]Women and Infants Hospital, Providence, RI, USA, [2]The Warren Alpert Brown University, Providence, RI, USA

Objectives: The American College of Surgeons Oncology Group (ACOSOG) Z0011 trial concluded that among patients treated with breast conservation therapy, those with limited metastatic nodes undergoing SLNB alone sustained no difference in disease-free or overall survival than those treated with ALND. Axillary USFNA has been shown to be specific for axillary involvement with a sensitivity ranging between 35 and 67%, depending on the stage of disease. Given the low impact of residual disease burden documented by Z11 and recognizing the consequences of SNB, we questioned whether AXUSFNA could substitute for SLNB in a select group of breast cancer patients. To this end, we aim to identify and describe the AXUSFNA false-negative cohort.

Method: Breast cancer patients with AXUSFNA were identified in the radiology registry at Women and Infants Hospital between 1/1/2006 and 8/1/2009. Cross-referencing with tumor registry node-positive patients identified the study group. One hundred forty-seven patients were identified in whom AXUSFNA and SLNB/ALND results were analyzed. Patients who received neoadjuvant chemotherapy were excluded. Variables collected include age, BMI, surgery, tumor histology, grade, lymphovascular invasion, size, receptor status, ALND, SLNB, and AXUSFNA results. The data collected from AXUSFNA included number of nodes documented, size, and appearance. The data was then analyzed using Stata 10.

Results: To date, 57 patients are analyzed. The true-positive AXUSFNA (TP) and false negatives (FN) are 91% (95% CI, 78.7–97.0%) and 33% (95% CI, 21.3–48.0%), respectively. Significant differences relate to extent of pathologic disease (extracapsular extension, and micro vs macro metastasis), surgical procedure, and AJCC stage. Significant differences for AXUSFNA between TPs and FNs were identified regarding node size and node description. Multiple regression analysis identified independent predictive variables associated with a false- negative AXUSFNA. Advanced stage and indeterminant or suspicious nodes remained inversely associated with an FN result (ORs <1.0). Node size is significant with larger nodes less likely to be false negative (OR < 1.0). Tumor stage remains borderline in significance. Neither receptor status, grade, LVI, or ductal-vs-lobular histology impacted the risk of false- negative AXUSFNA. In patients with a false-negative AXUSFNA, the SLN was positive in 12/15 patients and 3/15 had a "palpable" node. There was a trend for patients who were FNs to undergo mastectomy, unilateral or bilateral, more often than breast-conserving therapy. The FN cohort had lower proportion of nodes with extracapsular extension.

Conclusions: While the results of Z11 suggest axillary disease may be left in situ without impacting survival, our data suggest that one third of patients would be understaged without sentinel node biopsy. Although our USFNA false-negative rate of 33% approaches the 27% of residual disease left in the axilla by the Z11 protocol, appropriate staging can impact therapeutic decisions, and thus sentinel node biopsy should only be discarded in those patients where the results will not impact therapeutic decision making. We acknowledge that our dataset of 57 patients analyzed may be limited by small subgroups. Continued data collection on the 147 patients will allow us to further evaluate independent predictive variables.

0153 Early Results From the ABLATE Trial: Radiofrequency Ablation After Breast Lumpectomy (eRFA) Added To Extend Intraoperative Margins in the Treatment of Breast Cancer

V. Suzanne Klimberg[1], Sheldon Feldman[2], Marilee McGinness[3], Julie Barone[5], Cristiano Boneti[1], Julie Lang[4], Laura Adkins[1], Brian Badgwell[1], Jeanette Lee[1], Soheila Korourian[1]

[1]University of Arkansas for Medical Sciences, Little Rock, AR, USA, [2]Columbia University, New York, NY, USA, [3]University of Kansas Medical Center, Kansas City, KS, USA, [4]Arizona Cancer Center, Tucson, AZ, USA, [5]Comprehensive Breast Care of San Diego, San Diego, CA, USA

Objectives: We present the interim findings of a multicenter clinical trial of tumor excision followed by radiofrequency ablation (eRFA). eRFA is an intraoperative method that utilizes heat to create an additional 1-cm tumor-free zone around the lumpectomy cavity approximating the zone treated by brachytherapy. Single institution experience with eRFA has been successful. The purpose of this study was to evaluate the need for re-excision of close or positive margins after eRFA. In addition, we sought to determine the recurrence rate of those patients treated with eRFA as their only local therapy for breast cancer.

Method: From September 2010 to November 2011 we conducted an ongoing IRB-approved registry trial of patients with DCIS or invasive ductal cancer receiving eRFA. Patients with unifocal tumors less than or equal to 3 cm with clinically negative nodes were included. After standard lumpectomy, the RFA probe was deployed 1 cm circumferentially into the walls of the lumpectomy cavity. RFA was maintained at 100 degrees C for 15 min, which has been shown in preclinical and clinical data to effectively extend the lumpectomy margin by 1 cm. Doppler sonography was used to determine final ablation size. Standard H&E of lumpectomy margins was performed. Cosmesis was assessed with RTOG scale.
Results: Under an IRB-approved registry, 5 sites with 6 investigators enrolled 55 patients (mean age of 65 ± 9 years) with DCIS or invasive breast cancer and had an average tumor size of 0.9 cm ± 0.5 cm and underwent eRFA according to protocol. Thirty-two patients had invasive ductal carcinoma and 23 had DCIS. Most patients were Grade I, 16 were Grade II, and 4 were Grade III. Average margin size was 4 mm ± 3 mm. Margins were close in 14 (≤2 mm), focally positive in 2, and grossly positive in 4. Fifteen of 20 (75%) patients with positive or close margins were spared re-excision (15 of 55, 25% of cohort). Thirty-day morbidity and mortality rate was 7.2% and 0%, respectively
Conclusions: Early interim analysis of the ABLATE Registry suggested that eRFA could reduce the need for re-excision in patients with close margins by extending the surgical margin at operation. The complication rate for eRFA was low in this prospective multicenter trial. The ongoing trial will provide information regarding recurrence rates with eRFA to evaluate its potential role in BCS.

0143 Benign Arterial Calcifications on Screening Mammogram: A Marker for Coronary Artery Disease?

Amanda Kong, Deborah Karm, Melissa Wein, David Marks
Medical College of Wisconsin, Milwaukee, WI, USA

Objectives: Coronary artery disease (CAD) is the leading cause of death of women in the United States. Although many risk factors for CAD are well established, the diagnosis of CAD remains difficult due to lack of screening mechanisms. Women most at risk for CAD are often in the age range when screening mammography is also recommended. Studies have demonstrated that benign arterial breast calcifications (BACs) on screening mammography are associated with diabetes and hypertension, 2 well-known risk factors for CAD. Few studies have examined the correlation of BACs with women diagnosed with CAD. Our goal was to determine whether the presence of BACs on screening mammogram correlates with the presence of CAD.
Method: A retrospective chart review was performed on women age 40 years or older having undergone a digital screening mammogram within 2 years of also having a cardiac catheterization over a 10-year period. Clinicopathologic information was collected. Catheterization reports were reviewed by a cardiologist specializing in cardiac catheterization. The left main artery (LM), left anterior descending artery (LAD), the left circumflex artery (LCx), and the right coronary artery (RCA) were categorized as having no evidence of disease, minor luminal irregularities (stenosis < 50%), or as having significant disease (stenosis of ≥ 50%). Mammograms were reviewed by a single blinded radiologist for the presence of BACs. The BACs were quantified by recording the number of involved quadrants in each breast. Patients with BACs on screening mammography were compared to those without BACs using chi-square and Wilcoxon rank sum tests. Predictors of CAD were evaluated using logistic regression.
Results: Of the 201 patients identified, the median age was 65 years. Although 67.7% did not have diabetes, most were hypertensive (83.1%) and had hypercholesterolemia (79.6%). The majority of the patients were not smokers (80.1%) and had a family history of CAD (52.2%). Approximately 50% of patients had 1 or more vessels with clinically significant disease. After controlling for age, presence of diabetes, type of diabetes, presence of hypertension, and family history of coronary artery disease, history of smoking, hypercholesterolemia, and BACs were significant predictors of coronary artery disease (Table 1).

Table 1. Multivariate Analysis of Variables Predicting Coronary Artery Disease[a]

Factor	Odds Ratio	95% Confidence Interval	P Value
History of smoking			**0.003**
No	1.00		
Yes	4.04	1.62-10.06	
Hypercholesterolemia			**<.0001**
No	1.00		
Yes	8.00	3.10-20.64	
Calcifications present on mammogram			**0.004**
No	1.00		
Yes	2.64	1.37-5.06	

[a] Model also adjusted for age, presence of diabetes, type of diabetes,presence of hypertension, and family history of coronary artery disease.

Conclusions: Benign arterial calcifications present on digital screening mammography, history of smoking, and hypercholesterolemia were all significant predictors of CAD. The presence of BACs on digital screening mammography may serve as a screening tool to identify women at high risk for CAD.

0146 The Prognostic Significance of Axillary Lymph Node Ratio in Stage II/III Breast Cancer Patients Receiving Neoadjuvant Chemotherapy

Amanda Kong, Katherine Kelley, Rodney Sparapani, Tina Yen
Medical College of Wisconsin, Milwaukee, WI, USA

Objectives: Axillary lymph node status is one of the most important prognostic factors in breast cancer. Axillary lymph node ratio (ALNR; number of positive nodes/total number of nodes removed) is one proposed method of axillary staging and assessing prognosis. Few studies have examined whether this ratio may be a prognostic factor for survival in patients who have received neoadjuvant chemotherapy.
Method: A retrospective chart review was performed on stage II and III breast cancer patients who received neoadjuvant chemotherapy and underwent an axillary dissection over a 10-year period. Clinicopathologic and treatment information was collected and ALNRs were calculated. Patients with ALNRs = 0 were compared to those with ALNR > 0 but ≤0.25 and those with ALNRs > 0.25. Predictors of recurrence-free survival (RFS) and overall survival (OS) were evaluated using Cox proportional hazards ratios. Included in the models were variables with a $p < 0.05$ on univariate analysis and those selected a priori.
Results: Of the 114 patients, half were under the age of 50 and 65% had stage III disease. Most patients were white (79%) and the remaining were black (21%). The majority of tumors were invasive ductal carcinoma (76%), ER and/or PR positive (65%), HER2 negative (65%), and most were well or moderated differentiated (49%). Approximately 47% had a radiologic response and 22% (n = 25) had a complete pathologic response to neoadjuvant chemotherapy. Forty-five (39%) had ALNRs = 0; 40 (35%) had ALNRs > 0, but ≤0.25; and 29 (25%) had ALNRs > 0.25. On univariate analysis, differences in pathologic tumor size ($p = 0.02$), number of positive nodes ($p < 0.0001$), HER2 status ($p = 0.0002$), pathologic complete response ($p = <0.0001$), and recurrence ($p = 0.05$) were found between the 3 ALNR groups. Patient age, race, histologic type, grade, and hormone receptor status were not associated with ALNR. At a median follow-up of 35 months, there were 6 (5%) deaths, of which 5 were due to breast cancer, and 17 (15%) recurrences (11 distant and 6 locoregional). After controlling for multiple clinicopathologic and treatment factors, only black race and ALNR > 0.25 were found to be significant predictors of recurrence (Table 1). However, only black race was found to be a determinant of overall survival. When using number of positive lymph nodes in the model instead of ALNR, no variables were found to be predictors of recurrence or survival. These findings must be interpreted with caution, given the small sample size and number of events.

Table 1. Factors Associated With Recurrence and Overall Survival by Cox Proportional Hazards Models

Variable	Risk of Recurrence			All-Cause Mortality		
	RR	**95% CI**	**P value**	**RR**	**95% CI**	**P value**
Age	0.98	0.64-1.51	0.94	4.82	0.62-37.44	0.13
Race						
White	1.00			1.00		
Black	10.71	1.94-59.24	**0.007**	179.79	0.62-52142.81	**0.02**
Grade						
Low/Moderate	1.00			1.00		
High	4.58	0.94-22.28	0.06	37.63	0.72-1961.24	0.07
Pathologic tumor size	1.21	0.98-1.49	0.07	0.53	0.14-2.07	0.36
Lymph node ratio						
0	1.00			1.00		
>0 but <0.25	1.18	0.18-7.70		1.03	0.04-27.13	
>0.25	11.91	1.11-127.78	**0.04**	1.53	0.03-86.07	0.99
PCR						
No	1.00			1.00		
Yes	0.66	0.04-10.84	0.77	0.001	0.0-2.65	0.08

*Adjusted for type of breast surgery, receipt of radiation therapy and hormonal therapy, ER/PR and HER2 status.
RR, relative risk; PCR, pathologic complete response.

Conclusions: The majority (79%) of women with stage II and III breast cancer who undergo neoadjuvant chemotherapy have a low ALNR. There is no difference in recurrence rates or overall survival among the women with an ALNR > 0 but ≤ 0.25 compared to those with ALNR = 0. However, having a lymph node ratio > 0.25 is a significant predictor of RFS but not OS. These women are at high risk for relapse and may benefit from additional adjuvant therapies.

0078 Does Size of Breast Core Needle Biopsy Affect the Upstaging Rate of Flat Epithelial Atypia (FEA) Into Breast Cancer?

Lisa Korff, Denise Gilman, Syed Mohsin, Louis Vassy, James Jenkins, Mark Cripe
Grant Medical Center, Columbus, OH, USA

Objectives: Flat epithelial atypia (FEA) may transform into or be found adjacent to breast cancer. Current recommendations are to excise FEA when found on core needle biopsy. However, with use of larger core needles which obtain more tissue, the upstaging rate at subsequent surgical excision may decrease. This may call into question the need to excise pure FEA found on core biopsy. This study retrospectively reviews the upstaging rate using an 8-gauge vs 11-gauge core needle.

Method: Review of clinical data was performed on all diagnosis of pure FEA using either an 8-g or 11-g Mammotome stereotactic core needle biopsy (CNB) between 2005 and June 2011. Results of subsequent surgical excision were reviewed and considered upstaged if contained ductal carcinoma in situ (DCIS) or invasive cancer. Pearson's chi-square test was used to determine if statistically significant upstaging differences existed between final excision diagnosis of those first found with pure FEA on 8-g vs 11-g CNB.

Results: FEA was found on a total of 169 CNB in which follow-up was available. Coexistence of FEA with ADH, ALH, LCIS, DCIS, or invasive cancer was present in 93 of the 176 biopsies and was excluded. Among 76 CNB that obtained pure FEA, 18 (24%) cases were found using an 11-g needle and 58 (76%) cases for the 8-g needle. Only 2 cases were upstaged to invasive cancer, both from patients with FEA found using 8-g needle (3.4%). No patients were upstaged to DCIS. Pearson chi-square test revealed no statistical significance difference between the upstaging rates of pure FEA found using 8-g or 11-g Mammotome ($p = 0.425$).

Conclusions: We found that needle size did not affect the underestimation rate of pure FEA on CNB. The upstaging rate into DCIS or invasive cancer was not significantly different between the FEA found on 11-gauge and 8-gauge CNB. Our overall upstaging rate (2.6%) was lower than most previously published rates for pure FEA on CNB. Regardless of needle size used, this low upstaging rate questions the need to perform surgical excision on pure FEA found on CNB.

0250 Safety and Efficacy of Nipple-Sparing Mastectomy in Locally Advanced Breast Cancer
Starr Koslow, Alexander Swistel, Mia Talmor, Syed Hoda, Rachel Kaplan, Diana Martins Pereira
New York Presbyterian Hospital-Cornell, New York, NY, USA
Objectives: Nipple-sparing mastectomy (NSM) is gaining popularity among patients and surgeons and has a proven efficacy in the early breast cancer setting. In locally advanced breast cancer (LABC), the safety and efficacy of NSM remains unexplored. We believe that by using neoadjuvant chemotherapy as a means of downstaging locally advanced breast cancer, NSM is a viable option for select patients and can be performed with good cosmetic results, acceptable recurrence rates, and high patient satisfaction.
Method: We performed a search within our breast pathology database to identify all patients who underwent NSM from 2007-present. Two hundred fifteen patients underwent 325 consecutive nipple-sparing mastectomies (105 unilateral and 110 bilateral) from 2007-2011. These charts were individually queried to determine if patients had LABC requiring neoadjuvant chemotherapy. Patients who underwent NSM after neoadjuvant chemotherapy were included in this study.
Results: Of the 215 patients who underwent NSM, 16 NSMs were performed on 9 patients who received neoadjuvant chemotherapy for LABC; 7 patients elected to undergo contralateral prophylactic mastectomy at the time of their initial surgery. All patients were operated on by a single surgeon at our institution. Mean age at cancer diagnosis was 50 years old (range, 32-74). Mean tumor size was 55 mm (range, 40-80 mm) prior to neoadjuvant chemotherapy and 28.1 mm (range, 0-50) at the time of surgery. Median time from diagnosis to definitive surgery was 5 months (range, 4-8 mo). All but 1 patient received an anthracycline- and taxane-based chemotherapy combination regimen and postoperative radiation therapy to the chest wall/axilla. On pathology, 7 patients had invasive ductal carcinoma, 1 patient had invasive lobular carcinoma, and 1 patient had invasive apocrine carcinoma. Six patients had clinically positive axillary lymph nodes (LNs) prior to neoadjuvant chemotherapy. Eight patients underwent axillary dissection, of which 4 had positive metastatic cancer to axillary LNs. One patient had her nipple-areolar complex (NAC) removed due to DCIS seen close to the nipple margin; on final pathology of NAC no cancer was seen. All patients underwent postoperative breast reconstruction. While no patients had a local recurrence, 2 patients were found to have systemic disease. One of these patients recurred at 19 months postoperatively, with metastases to the brain and liver. The other patient was found to have brain metastases 1 month postop; this patient likely had undiagnosed stage IV disease at operation. The other 7 patients are alive with no evidence of disease at a median follow-up time of 15 months (mean = 30 mo; range, 14-56 mo).
Conclusions: We provide the largest population of NSMs performed in patients with LABC requiring neoadjuvant chemotherapy. While NSM is still a relatively novel technique, we believe that NSM can safely be performed in select LABC patients after neoadjuvant chemotherapy.

0240 Breast Cancer Pathology in Hawassa, Ethiopia
Vijay Kotecha[1], Evan Rosenbaum[1], Sahar Sherf[1], Lesley Taylor[2], Carol Harris[1], Agonafer Tekalegne[3], Belayhun Kibret[4], Fekade Yerakle[4]
[1]Albert Einstein College of Medicine, Bronx, NY, USA, [2]Pink Lotus Breast Center, Beverly Hills, CA, USA, [3]Malaria Consortium, Addis Ababa, Ethiopia, [4]Hawassa University College of Medicine and Health Sciences, Hawassa, Ethiopia
Objectives: Ethiopia faces enormous challenges in the diagnosis and treatment of breast cancer. This country of nearly 90 million people, with one of the lowest per capita incomes in the world, is equipped with 5 oncologists, 2 radiation therapy machines, and 1 public hospital that provides comprehensive cancer treatment. Reliable histologic grading is fundamental to breast cancer care, yet such services are not well established and no national tumor registry exists. As part of an ongoing project to enhance cancer care in Ethiopia, we performed a retrospective study of breast pathology in a large referral hospital in the Southern region. Our objectives were to (1) standardize pathology practices, (2) quantify the burden of disease, (3) characterize tumor biology, and (4) capture a sense of the disparities in cancer care.
Method: Our work was performed at the Hawassa University Referral Hospital, which serves 15 million people living in the Southern Nations, Nationalities, and People's Region (SNNPR). Our team consisted of a pathologist, a breast surgeon, and 3 medical students. We reviewed hematoxylin and eosin stained slides of surgical biopsies prepared from September 2009 to July 2011. Histological grading was performed using the Nottingham modification of the Scarff-Bloom-Richardson grading system, (NGS).

Data were cross-checked across multiple sources, including the case logbook, original pathology reports, and medical charts. All slide assessment was performed blinded to the original diagnosis.
Results: In total, pathology records from 1,357 biopsies were examined, of which 99 represented breast biopsies (7.3%) from 94 different patients. Of these, 37 (39%) patients had malignant lesions. The mean (+/- SD) age of patients with breast cancer was 40.1 (+/- 14). The distribution of the tumor grade was as follows: 10%, grade 1; 42%, grade 2; and 48%, grade 3. Male patients accounted for 13% of total breast pathology cases and 11% of malignancies. Lesion duration prior to presentation was noted in the records of 64 of the 94 patients and ranged from 10 days to 6 years (mean of 10.5 months). Among patients diagnosed with breast cancer, duration of symptoms averaged 13.9 months.

Characteristics of Breast Cancer	Ethiopia, Southern region 2009-2011	United States SEER data 2004-2008
Median age of onset	38	61
% Under age of 35	35	1.9
% Males	11	0.9

Conclusions: Our study reveals that breast cancer in the Southern region of Ethiopia has an early age of onset, an aggressive histological profile, and a high male-to-female ratio. Our project contributed to establishing histologic grading as standard practice. We have shown that 90% of breast cancer cases were Grade 2 and 3; 35% of patients were under the age of 35; and 11% of cancers occurred in males. Finally, the small case volume in a hospital that serves 15 million people implies substantial underdetection and innumerable disparities. Future work is needed to understand the tumor biology and address the challenges of breast cancer care in Ethiopia.

0139 Does Fellowship Training Equate to a Higher Rate of Lumpectomy for Breast Cancer?
Cyrus Kotwall[1,2], Mindy Merritt[1], Ashley Adams[1], Nicole Kilbourne[1]
[1]New Hanover Regional Medical Center, Wilmington, NC, USA, [2]UNC Hospitals, Chapel Hill, NC, USA
Objectives: It has been clearly demonstrated that breast conservation surgery (BCS) and mastectomy offer survival equivalence in early-stage breast cancer. However, recent studies continue to show underutilization of BCS. With increasing numbers of fellows trained in breast/surgical oncology fellowships, we wished to review the rate of BCS among all of our fellowship- and nonfellowship-trained surgeons.
Method: Our early-stage breast cancer single institutional database (T < 4 cm; N0, N1) containing 3,280 women was analyzed by surgeon profile. There were a total of 24 surgeons, of whom 7 did more than a total of 150 cases each during the time period between 1990 and 2010. Three surgeons underwent fellowships (2 in breast and 1 in surgical oncology). Analysis was by a 2-sided chi-square test of independence with a p value of < 0.05 considered as being significant.
Results: For the entire database with T < 4 cm, the prevalence of BCS was 18% in 1990. The rate peaked to 45% in 1999, and then fell to 28% in 2010. When the data was recalculated for T < 2 cm, the percentages were 23, 54, and 29%, respectively, for the same time periods. Comparing the 3 fellowship surgeons to the 4 surgeons who all did more than 150 cases, 1 of the breast surgeons had a rate of BCS of 30% (196/646); the other breast surgeons' rate was 45% (78/175), and the surgical oncologists' rate was 62% (117/188). The 4 other nonfellowship surgeons had rates of 24% (49/204), 36% (55/154), 45% (154/344), and 49% (146/300). There was not a significant difference between the prevalence of BCS performed between fellowship and nonfellowship surgeons (chi-square 0.517, df = 1, p = 0.47).
Conclusions: In conclusion, fellowship training in breast surgery did not equate to a higher rate of lumpectomy for breast cancer. Only 1 fellowship-trained surgeon had a BCS rate over 50%. Further investigation is needed as to why there is no difference in the rate of breast conservation surgery in specialty-trained surgeons as compared to nonfellowship-trained general surgeons.

0233 Delayed Presentation of Breast Carcinoma: The Dilemma of General Surgeons in a Suburban Center in Nigeria
James Kpolugbo, Osas Uhunmwagho
Irrua Specialist Teaching Hospital, Irrua, Edo State, Nigeria
Objectives: So much is being done to improve diagnosis and treatment of breast cancer. The challenges in rural or suburban centers in Nigeria include delayed presentation with poor treatment outcomes. The

study aims at evaluating the pattern of presentation of breast cancer in a suburban setting in Nigeria with a view to making recommendation on improving disease outcome.
Method: This 5-year retrospective study involved extracting key information from the patients' clinical notes. Information extracted included duration of symptom at presentation, place of first presentation, age at presentation, stage at presentation, and the treatment received by the patients.
Results: Fifty-nine percent of patients were below 50 years of age, with a mean of 46.9 ±1.4. Only 34% consulted healthgivers within the first 6 months of symptoms, while 44% between 6 and 12 months of onset. While 40% of our patients present first to the outpatient clinic of the tertiary hospital, 36% presented to herbal homes and churches at onset. Eighty-seven percent presented with stage 3 and 4 breast disease, with only 21% of our patients having some form of surgery.
Conclusions: Our study shows very late presentation of our patients, the majority of whom are rural women with very poor disposition to available treatment options. The reasons for this situation are possible poverty and illiteracy, thus calling for renewed emphasis on health education programs regarding breast cancer, targeting women who are at higher risk of the disease.

0145 Breast-Conserving Surgery in BRCA1/2 Mutation Carriers
Ava Kwong[1,2], Connie HN Wong[1,2], Dacita TK Suen[1], Clement Chen[1]
[1]The University of Hong Kong, Hong Kong, Hong Kong, [2]The Hong Kong Hereditray Breast Cancer Family Registry, Hong Kong, Hong Kong
Objectives: Ten percent of women with breast cancer who are treated with breast-conserving surgery (BCS) are known to have a risk of developing an ipsilateral-breast tumor recurrence (IBTR). It has been suggested that BRCA mutation carriers have a higher rate of local recurrence although findings are still inconsistent between studies. Hence, the optimal local therapy for women with BRCA-associated breast carcinoma remains controversial. We report the outcome of BCS in BRCA mutation carriers in a Chinese cohort.
Method: Between 1 March 2007 and 28 February 2011, a total of 418 women were recruited for genetic testing based on clinical risk through the Hong Kong Hereditary Breast Cancer Family Registry. Fifty-two women were found to be BRCA1/2 mutation carriers, of whom 2 only had ovarian cancers. One hundred thirteen (27%) women had BCS performed. This included 19 (19/50, 38%) BRCA mutation carriers with 3 having bilateral BCS and these were compared with 94 (94/362, 26%, of whom 4 only had ovarian cancers) noncarriers, of whom 10 had bilateral BCS. Primary endpoints were incidence of IBTR/local regional, contralateral breast cancer if first presentation was ipsilateral breast cancer, and distant relapse. Median follow-up was 50 and 30 months for carrier and noncarrier groups, respectively.
Results: Median age was 41 and 42 years for mutation carriers and nonmutation carriers. Overall for both carriers and noncarriers, local relapse was more likely in those women who had BCS compared to those who had mastectomy in the whole cohort who had genetic testing (10.3% vs 4.6%, P = 0.024). For those who had BCS, local recurrence rate was 9.1% in mutation carriers and 10.6% in noncarriers. There was no significant difference in the tumor size being of 1.64 cm vs 1.78 cm, respectively. Five-year cumulative incidence of IBTR was 5.4% for mutation carriers and 8.2% for noncarriers (hazard ratio = 0.36; 95% confidence interval (0.11, 1.19); P = 0.094). Five-year cumulative incidence of contralateral breast cancer after BSC was 9.1% for mutation carriers and 3.2% for sporadic controls (P = 0.414). BRCA mutation carriers are statistically more likely to have distant relapse when compared to noncarriers (23.4% vs 13.3%, p = 0.033) and it is more likely for carriers who had BCS than those with MRM to have distant relapse (27.3% vs 19.6%).
Conclusions: Our data suggest that local replase risk after BCS overall is more than that of mastectomy in both BRCA mutation carriers and noncarriers. However being a carrier does not increase the risk of IBTR after BCS although risk of contralateral breast cancer is increased. There is also an increased risk of distant relapse in BRCA mutation carriers. These risks and the higher likelihood of developing contralateral breast cancer should be discussed with carriers when deciding on the option of breast conservation surgery and also risk-reducing strategies.

0152 Male Breast Cancer in Hong Kong – A Population-Based Analysis of Epidemiological Characteristics, Overall, Cancer-Specific, and Disease-Free Survival in 1997-2006

Ava Kwong[1,3], WW Chau[1], Oscar WK Mang[2], Connie HN Wong[1,3], Hong Kong Breast Cancer Research Group[4], Stephen CK Law[2]

[1]The University of Hong Kong, Hong Kong, Hong Kong, [2]The Hong Kong Cancer Registry, Hong Kong, Hong Kong, [3]The Hong Kong Hereditary Breast Cancer Family Registry, Hong Kong, Hong Kong, [4]Hospital Authoriy Hospitals, Hong Kong, Hong Kong

Objectives: Male breast cancer (MBC) is rare worldwide with a reported incidence of 0.5%-1% and there is a variation between different geographical areas. More importantly there is an increased incidence in male breast cancer being reported in Western literature. Little is still known about MBC's etiology, and there have been no prospective randomized clinical trial on MBC. Recent reports suggest that there may be ethnic differences in presentation then tumor biology of female breast cancers but limited information is available for male breast cancer due to its rarity, especially reports from Asian countries. We retrospectively reviewed the clinico-pathological and survival data from a cohort of Chinese male breast cancer patients over 10 years.

Method: A retrospective review of medical records of men who were diagnosed with breast cancer between January 1, 1997 and December 31, 2006, were collected. Descriptive statistics were employed to analyze the epidemiological and clinical data. Estimations of the corresponding overall, cancer-specific, and disease-free survivals at 5 years were estimated using Kaplan-Meier method.

Results: A total of 142 verified male breast cancer patients' medical records and datasets were eligible for the final analysis. Mean age of diagnosis was 64.87; 86.6% were invasive cancers, 76.1% were operated on, and all had mastectomy. Of those known, 22.5%, 32.4%, 5.6%, and 7.7% presented at stages I, II, III, and IV, respectively. A total of 94.5%, 84.8%, and 60.5% had ER, PR and HER2 positive cancers, respectively; 2.8% had triple-negative cancers. The overall, cancer-specific and disease-free survivals at 5 years were 73.1%, 85.1%, and 83.8%, respectively.

Conclusions: We present the first population-based male breast cancer epidemiological and survival study in Hong Kong, Southern China. This provides a baseline study cohort for comparative epidemiological studies with other Asian countries and related studies internationally.

0108 Radio-Guided Occult Lesion Localization (ROLL) vs Wire Localization for Nonpalpable Breast Lesions: The Experience of National Cancer Institute of Mexico

Julio Lau de la Vega, Juan Enrique Bargallo Rocha, Hugo Rico Olvera, Oscar Cerezo Camacho

National Cancer Institute of Mexico, Mexico City, Mexico

Objectives: The current study sought to evaluate the efficacy of radio-guided occult lesion localization (ROLL) vs wire localization (WL) for nonpalpable breast lesions in obtaining adequate resection margins and volumes of resection.

Method: A total of 92 patients with nonpalpable breast lesions undergoing excision biopsy at The National Cancer Institute of Mexico, between January 2009 and September 2011 was retrospectively analyzed. The excisions were guided by WL or ROLL. The medical records were reviewed to determine margins, the specimen size, and volume. The optimal resection volume (ORV) was defined as the spherical tumor volume with an added 1.0-cm margin, and the total resection volume (TRV) as an ellipsoid. A calculated resection ratio (CRR) was determined to indicate the excess tissue resection, dividing the TRV by the ORV.

Results: Both techniques resulted in 100% retrieval of the lesions. Of the 92 excisions, 53 (57.6%) were guided by WL and 39 (42.4%) by ROLL. In the ROLL group, 94.8% of the margins were negative compared to 69.9% of negative margins in the WL group, $p = 0.216$. There was no difference in the median ORV (30.19 vs 27.60, $p > 0.4152$), TRV (63.22 vs 51.64, $p > 0.3511$), and CRR (2.76 vs 2.83, $p > 0.6354$) between the ROLL and WL group.

Conclusions: ROLL technique is as effective as WL for excision of nonpalpable breast lesions. Although not significant, the ROLL technique may improve the rate of negative margins. There was no significant difference in the excision volumes, even though they were large in both groups. ROLL is an alternative to WL.

0079 *B*reast Cancer *S*taging With *Ma*gnetic *R*esonance for *T*reatment Planning (B-SMART) – A Prospective Randomized Trial: Interim Analysis

Rakhshanda Layeequr Rahman[1], Muhammad Omar Khokhar[1], Lynn Day[1], Anne Larkin[2], Robert Quinlan[2], Diane Bavosi[2], Amy Sharon[2], Chase Derrick[1], John Coscia[1], Gary Aragon[1], Ashraf Khan[2], Mark Arredondo[1]

[1]Texas Tech University Health Sciences Center, Amarillo, TX, USA, [2]UMass Memorial Healthcare, Worcester, MA, USA

Objectives: Determine if routine use of magnetic resonance imaging (MRI) for breast cancer staging yields better margin clearance and lower rate of re-excision in lumpectomy candidates compared with conventional imaging.

Method: Prospective 2-arm trial is designed to detect a drop in margin re-excision from 20% to 10% by randomizing breast cancer lumpectomy candidates to MRI in addition to conventional imaging (mammogram /ultrasound) [Arm-1] or conventional imaging alone [arm-2] before surgical planning. For a power of 80% and an alpha error of 5%, 200 patients will be enrolled per arm. Group randomization is used for every participating surgeon. Main outcomes include closest resection margin of, re-excision rate, and resection margin volume. Confounders include patient's age, type and size of cancer, surgical technique, and breast density.

Results: Between August 2009 and October 2011, 103 patients were enrolled (25% of target accrual). Ninety-one patients were available for analysis. Arm-1 and 2 were similar regarding median (interquartile range) age [63(12) yr vs 60(15) yr; p = 0.58], tumor volume [1.8 (2.5) cm^3 vs 2.3 (3.7) cm^3; p = 0.26], and breast density [11 (6)% vs 13 (6)%; p = 0.56], respectively. Arm-1 and 2 were also similar in distribution of tumor type [invasive ductal {31 (74%) vs 41 (84%)}; invasive lobular {4 (10%) vs 0}; in situ ductal {7 (17%) vs 8 (16%)} p = 0.11] and surgical technique [ultrasound-guided resection {19 (49%) vs 20 (42%)}; wire-localized resection {20 (51%) vs 28 (58%)} p = 0.52], respectively. Mean (95% CI) of outcome measures between Arm-1 and 2 were: (i) Closest margin = 3.4 (2.4, 4.6) mm vs 3.4 (2.4, 4.5) mm; p = 0.99. (ii) Margin volume = 34 (22, 53) cm^3 vs 17 (12, 26) cm^3; p = 0.03. The re-excision rate was 3 (7.3%) patients in arm-1 vs 8 (17%) in arm-2; (p = 0.21). Results adjusting for confounders were similar. MRI identified additional cancers in 15 (35%) and failed to identify known cancer in 2 (5%) of patients.

Conclusions: Staging MRI in breast cancer patients may not translate into better margin excision in lumpectomy candidates and is associated with higher margin resection volume.

0066 The Value of Mammography Within 1 Year of Conservative Surgery for Breast Cancer

Jana Lewis[1,2], Paul Tartter[1]

[1]St. Lukes Roosevelt Hospital Center, New York, NY, USA, [2]Maimonides Medical Center, Brooklyn, NY, USA

Objectives: Guidelines for screening mammography have been established by numerous medical societies. Guidelines have not been established for follow-up mammography for patients who have been treated with lumpectomy and radiation for breast cancer. Many radiologists recommend (interval) mammography of the treated breast 6 months following completion of treatment to assess changes due to surgery, radiation, and to detect early recurrence. The role of these interval mammograms has not been established. The aim of this study is to determine the value of mammography within 1 year of conservative surgery for breast cancer.

Method: Patients were identified by searching the breast cancer database for the diagnoses of ductal carcinoma in situ, infiltrating ductal carcinoma, and infiltrating lobular carcinoma between August 1999 and April 2011. Postoperative mammogram dates and results were obtained through the institution's radiology system or review of patients' charts. Patients with mammography within 8 months of surgery were included in the study.

Results: Ductal carcinoma in situ, infiltrating ductal carcinoma, and infiltrating lobular carcinoma were found in 1,002 patients who underwent breast conservative surgery (lumpectomy with or without sentinel lymph node biopsy). There was complete mammography follow-up data available for 791 patients and 169 (17%) had postoperative interval follow-up mammogram within 8 months. Patients whose cancers were mammographically occult were significantly more likely to have interval mammography than those patients whose cancers were evident on pre-diagnosis mammography (30% vs 20%, p = 0.019). There were no statistically significant differences in age, race, height, weight, tumor size, tumor differentiation, estrogen receptor status, nodal status, treatment with chemotherapy, hormonal therapy or radiation, local and distant recurrence, and disease-free survival. Ninety percent of the interval mammograms were BI-

RADS 1, 2, or 3. Mammogram findings for the 10% (17) of patients with BI-RADS 4, 5, and 6 included 11 calcifications, 5 nodules or masses, and 1 postsurgical change--not otherwise specified. Two of the 17 (1.2%) findings were malignant: a nodule biopsied was found to be a new infiltrating cancer; the patient was diagnosed with multicentric disease and had a mastectomy. A second patient after a lumpectomy for infiltrating lobular cancer was found to have a new mass which on biopsy was infiltrating ductal cancer and she underwent a second lumpectomy. Five of the 622 (0.8%) patients who did not have interval mammography were found to have local recurrence within 1 year of surgery (1.2% vs 0.8%, p = 0.356). One patient was found to have a palpable mass shortly after her 1-year postoperative mammogram was negative, and subsequently underwent a mastectomy for a new infiltrating ductal carcinoma.
Conclusions: Interval follow-up mammography was performed significantly more frequently on patients with negative findings on initial preoperative mammograms. The likelihood of obtaining a significant finding on short interval follow-up mammography after conservative surgery for breast cancer is 1.2%, more than double the yield of screening mammography in patients who have not had breast cancer. Interval mammography in our patients identified 2 cases of multicentric disease. Short interval mammography did not identify any local recurrences in this series.

0150 Revisiting the Free Nipple Graft As an Option for Women Undergoing Mastectomy With Immediate Reconstruction

Jaime Lewis[1,2], Paul Smith[2], Nazanin Khakpour[1,2], Christine Laronga[1,2]
[1]H. Lee Moffitt Cancer Cencer & Research Institute, Tampa, FL, USA, [2]University of South Florida, Tampa, FL, USA

Objectives: Breast reconstruction options for treatment or prophylaxis of breast cancer continue to evolve and now include nipple-sparing mastectomy (NSM) techniques. Eligibility for NSM is comprised of oncologic and technical/cosmetic criteria. In women meeting oncologic criteria for NSM, we explored whether free nipple grafting can overcome some of the technical/cosmetic limitations.
Method: An IRB-approved retrospective review of prospectively gathered women having NSM with/without immediate reconstruction was conducted to identify women having free nipple grafting synchronous with mastectomy and immediate reconstruction. Indications for NSM were either prophylaxis (risk reduction) or breast cancer treatment. Data reviewed included clinico-pathologic features, operative procedures, immediate postoperative and delayed complications, and outcomes. Technical eligibility for our standard NSM included no prior surgical procedures involving the nipple areolar complex, no history of breast/mantle irradiation, no smoking, location of the nipple above the inframammary fold, and breast size less than 700 grams. Patients desiring nipple preservation who did not meet these criteria were considered for free nipple grafting.
Results: We identified 9 women who underwent NSM as a skin-sparing mastectomy through a circumareolar skin-sparing incision with immediate reconstruction, including free nipple grafting. Mean age was 45 years (range, 31-60), BMI 25.1 (range, 21.5-30.9), breast weight 559.1 g (range, 134.5-1378), and follow-up 13.9 months (range, <1-48.8). Five of the women had a current diagnosis of cancer (2 unilateral, 3 bilateral) and 4 underwent their procedures purely for high-risk prophylaxis (all bilateral). Two patients underwent unilateral mastectomy with free nipple grafting; the remaining 7 had bilateral procedures. Reconstruction with free nipple grafting rather than NSM was chosen due to choice of transverse rectus abdominus musculocutaneous (TRAM) reconstruction (1 patient), breast ptosis (1 patient), prior circumareolar incision (2 patients), large breast size (2 patients), and history of breast irradiation (3 patients). Intraoperative evaluation of the nipple base was performed prior to re-implantation in 7 of the patients (1 touch prep, 6 frozen section) and was negative for cancer or atypia in all. Permanent pathologic evaluation of the nipple base in all patients was negative for cancer. Two women had TRAM flap reconstruction, 1 had tissue expanders with alloderm slings, and 6 had latissimus dorsi flaps with tissue expanders. One (11.1%) woman lost both of her nipple grafts due to tissue expander infections and later underwent nipple reconstruction. Nipple graft take averaged 91% (range, 60-100%). Four (44.4%) women developed some degree of nipple hypopigmentation; 1 (11.1%) required nipple tattooing twice. Two (22.2 %) women had complete loss and 4 (44.4%) had partial loss of nipple projection. None have experienced a new diagnosis of breast cancer or a recurrence.
Conclusions: Free nipple grafting at the time of mastectomy with reconstruction is a viable option for women who meet the oncologic criteria to undergo NSM but have technical/cosmetic variations, including previous radiation therapy, unfavorable for a standard NSM approach.

0264 Clinical Relevance of Preoperative Breast MRI

Jennifer Lin[1,2], Nabil Wasif[1], Connie Chiu[1], Alice Chung[2], Armando Giuliano[2]
[1]John Wayne Cancer Institute, Santa Monica, CA, USA, [2]Cedars-Sinai Medical Center, Los Angeles, CA, USA

Objectives: Preoperative breast MRI in surgical planning identifies additional lesions that otherwise are not detected with mammography. We hypothesized that these lesions are clinically significant.

Method: Using a prospective database, 212 patients with a biopsy-proven primary breast cancer (invasive or in situ carcinoma) obtained a preoperative breast MRI to aid with surgical planning. We assessed the initial type of surgery, the number of additional lesions found on MRI, the management and significance of the additional lesions, and whether a change in surgical plan was needed. Additionally, a retrospective cohort of a consecutive series of patients with invasive or in situ carcinoma without preoperative breast MRI was used to compare margin involvement after initial breast-conserving surgery.

Results: Of 212 patients, 93 patients (43.8%) had additional findings on MRI that were not seen on initial mammogram. Thirty-six had contralateral findings, 26 had additional ipsilateral findings, and 31 had bilateral findings. Thirty-five of these patients underwent 38 biopsies. Thirteen biopsies among 12 patients demonstrated malignant pathology (invasive or in situ carcinoma in 12 of 212 patients; detection rate, 5.7%) and 24 biopsies among 22 patients had benign pathology (22 in 212 patients, 10.4%). In total, MRI was able to detect 7 new contralateral cancers (3.3%) and 6 additional ipsilateral cancers (2.8%). The MRI findings changed the operative plan in 36 patients (17.0%): 6 converted to bilateral mastectomies, 4 converted to mastectomy, 2 converted to bilateral breast-conserving surgery, and 3 also had an excisional biopsy; a larger breast-conserving surgery was performed in 21 patients (8 for a second adjacent lesion identified on MRI, and 13 for a size discrepancy >2 cm of the lesion between mammogram or ultrasound and MRI). Upon review of the pathology, MRI overestimated the size of the lesion by >2 cm in 2.8% of patients and underestimated the size by >2 cm in 2.8% of the patients. A second lesion seen on MRI did not correlate to any findings on pathology in only 0.9% of patients. Additionally, the rate of tumor-involved margins, defined by invasive or in situ carcinoma on additional separate margin specimens, was not significantly different in the MRI and no-MRI groups in those patients undergoing breast-conserving surgery (26.4% vs 27.5%, p = 0.883).

Conclusions: Although preoperative breast MRI in patients with a new primary breast cancer (invasive or in situ carcinoma) can detect additional lesions not seen initially with other imaging and can be used to alter the final operative plan, it does not help obtain tumor-free margins after breast-conserving surgery.

0082 Breast Cancer Initial Timeliness of Care: Barriers to Diagnosis and Treatment in a Public Hospital

Jared Linebarger[1,2], Marina Mosunjac[3], Monica Rizzo[1,2], Joel Okoli[2,4], Harvey Bumpers[5], Cherlyn Harrison[2], Makeeta Rayton[2], Adrienne Kinnaird[2], Shyteesha Dawson[2], Aarti Ranani[2], Sherita Hearn[2], Sheryl Gabram[1,2]
[1]Winship Cancer Institute of Emory University, Atlanta, GA, USA, [2]Georgia Cancer Center for Excellence at Grady, Atlanta, GA, USA, [3]Department of Pathology or Emory University Hospital, Atlanta, GA, USA, [4]Morehouse School of Medicine, Atlanta, GA, USA, [5]Michigan State University, CHM, Lansing, MI, USA

Objectives: Disparities in breast cancer are related to divergent outcomes among ethnic, cultural, and socioeconomic groups. We previously described a relative treatment delay for patients undergoing breast-conserving surgery at a public hospital serving 90% African Americans (AA) and 80% indigent, uninsured, or Medicaid-only patients. Here we report the timeliness of breast cancer care in a similar cohort and identify barriers to early diagnosis and treatment.

Method: Retrospective review of a single institution's breast cancer registry was performed from January to June 2011. Patients diagnosed with stage 0-III breast cancer were identified to assess timeliness of diagnosis and treatment. All registry patients were eligible to participate in a telephone survey to identify barriers to care.

Results: Registry review identified 51 patients 37-76 years of age (median, 53). Forty-four presented with stage 0-3 disease, with AA representing 86% (n = 38). Medicaid (n = 19, 43%), Medicare (n = 6, 14%), and self-pay (n = 13, 30%) were the most common payment methods. Most cancers presented with a breast symptom or exam finding leading to diagnostic imaging (n = 35, 80%), while 9 (20%) were diagnosed by screening mammography. Subsequently, 5 (11%) failed to present for scheduled treatment and received a certified letter, and 5 (11%) transferred care to another institution. Time intervals were calculated as median (range) business days from abnormal imaging study to biopsy: 7 (1-288); biopsy to

consultation for treatment: 9 (6-26); and biopsy to surgery (n = 22)/neoadjuvant therapy (n = 12): 34 (8-55)/32 (22-62). The registry included 2 LCIS patients and 1 with a nonmetastatic malignant phyllodes tumor. Of the remaining 48, stage at presentation was: 0 (n = 9, 19%), IA (n = 15, 31%), IIA (n = 5, 10%), IIB (n = 8, 17%), IIIA (n = 4, 8%), IIIB (n = 2, 4%), and IV (n = 5, 10%). At the time of survey, 1 patient was deceased, 11 could not be reached, and 32 agreed to participate (63%). Two patients (6%) had completed college; 24 (75%) were currently unemployed; and 1 (2%) had current full-time employment. Income level was reported as $15,000 to $25,000 by 10 (31%) and less than $15,000 by 18 (56%). Cost, fear, and awareness were identified as the top 3 categories of barriers to breast health services, and the top 3 cost-, fear-, and awareness-related barriers are shown in Table 1.

Table 1. Top 3 Cost-, Fear-, and Awareness-Related Barriers to Breast Care

Rank	**Cost** (DNA = 5)	**Fear** (DNA = 2)	**Awareness** (DNA = 10)
1st	No insurance	Being diagnosed with cancer	Unaware of education services
2nd	Unaware of low-cost services	Losing a breast	Unaware of breast health risk
3rd	Unable to afford transportation	Procedure-related discomfort	Unaware of screening guidelines

DNA, Did not answer

Conclusions: Breast cancer care was provided predominantly to a minority and indigent population, and delays were encountered in both diagnosis and treatment. Cost-, fear-, and awareness-related concerns were identified as major barriers to both diagnosis and treatment. These barriers are currently being individually addressed in implementing quality improvement initiatives to decrease disparities in breast health at this institution.

0189 Bioptics BioVision Imaging vs Analog X-ray for Patients Undergoing Excisional Biopsies by Wire Localization

Therese Lizardo-Escano[1,2], Anita McSwain[2], Jessica Torrente[3], Jocelyn Rapelyea[3], Rachel Brem[3], Christine Teal[2]

[1]The George Washington University, Washington, DC, USA, [2]The GW MFA Breast Care Center, Washington, DC, USA, [3]The GW Breast Imaging and Interventional Center, Washington, DC, USA

Objectives: X-ray imaging is the standard of care for verifying adequate excision in patients undergoing breast biopsies by wire localization. A number of studies have evaluated the use of Bioptics BioVision (Faxitron Bioptics, Tucson, AZ) dedicated specimen imaging system vs standard mammography for specimens following surgical excision by wire localization. Dedicated intraoperative specimen radiography can provide benefits, including immediate verification of excised breast tissue margins and lower re-excision rates. This computerized system is also more time efficient, generates high-quality images, and automatically saves images to a digitized archive for reference at a later time. The purpose of our study was to determine the improved efficiency and decrease in intraoperative time utilizing Bioptic BioVision imaging compared to standard analog imaging of specimen radiography**.**

Method: A retrospective chart review of 35 patients' specimen radiographs who had both bioptic imaging and x-ray of excised specimens during surgery between July 2011 and September 2011 were included. Patients' charts were analyzed for the recorded times for the time from specimen excision to determination of adequate margin excision with both Bioptic BioVision dedicated specimen radiography system and standard specimen radiography. The Bioptics imaging was performed in the operating room, as compared to routine specimen radiography where the surgeons hand-carried specimens to radiology for imaging to minimize delays. Inclusion criteria included all patients undergoing breast excisions by wire localization during that time period.

Results: Of the 35 patients, all specimens examined via digital mammography with the Bioptic system required less imaging time than routine specimen radiography. On average, Bioptics required 1.9 min whereas x-ray required 15.8 min. The range of time for Bioptics imaging was 1.3 min to 4 min. The range of time for routine specimen imaging was 12.6 min to 19.3 min. Imaging quality was always superior with Bioptics BioVision imaging compared to the standard x-rays based on visual comparison of both radiographs.

Conclusion: Intraoperative digital mammography is an excellent alternative to standard specimen radiography for patients undergoing excisions by wire localization as imaging can be performed in the operating room which provides immediate results to surgeons without having to wait for specimen radiographs to be returned to the operating room or breaking scrub, requires less imaging time, and has higher quality images. Larger studies including cost analysis and re-excision rates are necessary to further define the benefits of intraoperative specimen radiography with a dedicated specimen radiography system.

0133 Positive Margins and the Need for Mastectomy After Bracketed Localization of Extensive Calcifications or Multifocal Breast Cancer

Jillian Lloyd, Sanjay Bagaria, Tameeza Gibson, Xochiquetzal Geiger, Sarah McLaughlin
Mayo Clinic, Jacksonville, FL, USA

Objectives: Bracketing of nonpalpable breast tumors is used to help facilitate breast-conserving surgery (BCS) in the setting of extensive suspicious calcifications or multifocal/satellite tumors. Existing literature, however, lacks data on specimen characteristics and positive margin rates after bracketing is performed. We sought to review our BCS experience and compare the clinical and pathologic features of bracketed and unbracketed breast cancer specimens.

Method: Through retrospective review, we identified 415 women with nonpalpable breast cancers undergoing BCS at our institution between July 2007 and May 2011. Patients having concomitant BCS and reduction mammoplasty were excluded. We performed radioactive seed localization bracketing for extensive calcifications spanning more than 3 cm or for multifocal/satellite tumors greater than 2 cm from the primary lesion. Statistical analysis comparing bracketed and unbracketed breast cancer specimens was performed using chi- square and Fisher exact tests with $p < 0.05$ considered significant.

Results: Of the 415 patients having BCS, 54 (13%) had bracketed localizations while 361 (87%) were unbracketed. In general, tumors requiring bracketing were larger (2.0 cm vs 1.5 cm, $p < 0.0027$) and more likely to be Her2 positive (20% vs 7%, $p < 0.001$), but tended to be similar to unbracketed tumors with respect to patient age, tumor histology (invasive ductal, invasive lobular, or DCIS), and nodal stage (all $p > 0.14$). Not surprisingly, gross pathology demonstrated larger specimen excision volumes for bracketed lesions (median, 138 cm^3 vs 88 cm^3, $p = 0.001$). Overall, 71/415 (17%) women had positive margins. Interestingly, when analyzed according to localization technique, significantly more bracketed [17/54 (32%)] than unbracketed patients [54/361 (15%)] had positive margins ($p = 0.003$). Although the median number of re-excisions to achieve negative margins for bracketed and unbracketed patients with positive margins was similar (1 vs 1), 7/17 (41%) bracketed women required conversion to mastectomy compared to only 9/54 (17%) unbracketed despite having similar histology as the indication for re-excision ($p = 0.04$). However, overall among the 54 women with extensive calcifications or widespread local disease, bracketed localization saved 47/54 (87%) women from having unnecessary mastectomy.

Conclusions: The positive margin rate of nonpalpable breast cancers needing bracketed localization is double that of focal, unbracketed cancers. However, the larger surgical specimens and higher percentage of positive margin patients requiring mastectomy suggests that bracketed patients were borderline candidates for BCS at presentation. Despite this, bracketing lesions facilitated BCS in the majority of these patients.

0171 Autologous Inferior Dermal Sling With Concomitant Skin Envelope Reduction Mastectomy: An Excellent Surgical Choice for Women With Macromastia and Clinically Significant Ptosis

Paula Lundgren, Randall Yetman, Steven Bernard, Risal Djohan, Raymond Isakov, Jill Dietz
Cleveland Clinic, Cleveland, OH, USA

Objectives: Choices for breast reconstruction after mastectomy in women with macromastia and ptosis remain a challenge. We employ a technique for mastectomy using an autologous inferior dermal sling with concomitant skin envelope reduction. We believe the vascularized sling diminishes the risk of skin necrosis compared to classic reduction techniques yet provides a more natural shape than an elliptical incision in larger breasted women.

Method: Between July 2009 and October 2011, a single breast surgeon performed 26 mastectomies on 15 women using this technique. Classic Wise reduction pattern incisions with removal of skin at the nipple areolar complex were used. A dermal sling was created by deepithelializing the inferior flap. Patients underwent immediate reconstruction. Chart review evaluated potential risk factors, and postoperative outcomes.

Results: Commonly evaluated risk factors for complications were studied including age, BMI, radiation, and smoking. We also considered specimen size as a potential confounder. The average age of the patients was 49 years (30 to 67). Three patients had postoperative radiation. The average BMI was 31.0 kg/m^2 (22.3-44.1 kg/m^2). Specimen size varied from 483 g to 1814 g with an average of 1018 g. None of the patients smoked. Eleven of 15 patients had surgery for treatment of breast cancer while 4 patients underwent bilateral prophylactic mastectomies. Fourteen patients had immediate reconstruction with placement of tissue expanders, and 1 patient had bilateral DIEP flap reconstruction. Major complications, defined as patients requiring operative intervention, occurred in 2 patients (13%) or in 2 of 26 breasts (7.7%). An additional patient had office-based skin debridement (overall complication rate, 20%). Of the major complications, 1 patient had evacuation of a hematoma postoperatively with no further sequelae. A seroma, complicated by infection, necessitated removal of the expander in the second patient. The remainder of the patients recovered uneventfully with excellent cosmetic results, including 3 patients who had postmastectomy radiation. Age was not found to increase the risk of complications in this small cohort. The average age of patients with complications was 40 y, compared to 52 y without. BMI trended lower in those with complications (29.2 kg/m^2 vs 31.6 kg/m^2). Higher specimen weight did seem to correlate with more complications, 1407 g average in those with complications, compared to 967 g without.
Conclusions: We present our experience with a surgical and reconstructive technique that is an appealing option for women with significant macromastia and breast ptosis. The complication rate in our present review is lower than our previously reported rates for mastectomy with tissue expander reconstruction. The major complication rate in the former study was 24%, compared to 13% presently. This is particularly relevant in these patients with a higher BMI (average 31kg/m^2) considering BMI was previously found to be a strong predictor of less desirable outcomes (former group average BMI was 26.1 kg/m^2). Ongoing experience with this typically higher risk cohort will allow further evaluation of potential risk factors and benefits using this technique.

0201 Implications of Axillary Lymph Node Dissection on Management of Breast Cancer Patients
Sarah Mann[1,2], Therese Lizardo-Escano[1,2], Anita McSwain[1], Rebecca Kaltman[4], Martin Ojong-Ntui[3], Ashimi Saini[3], Imad Tabbara[4], Christine Teal[1]
[1]The GW MFA Breast Care Center, Washington, DC, USA, [2]The George Washington University, Washington, DC, USA, [3]The GW Department of Radiology, Washington, DC, USA, [4]The GW Department of Internal Medicine, Washington, DC, USA
Objectives: Among patients with limited sentinel lymph node metastasis, the American College of Surgeons Oncology Group (ACOSOG) Z0011 Trial demonstrated that axillary lymph node dissection (ALND) had no survival benefit compared to sentinel lymph node biopsy (SLNB) alone. However, ALND provides information about the number of additional lymph nodes containing metastases, which may lead to implications for treatment. The purpose of our study was to determine whether ALND impacted the recommendations for chemotherapy and radiation therapy for breast cancer patients as opposed to SLNB alone.
Method: We retrospectively queried our breast care center's database to identify patients with 1 to 3 positive sentinel lymph nodes who had undergone ALND between October 2001 and June 2011. Unlike ACOSOG Z0011, mastectomy patients were included in this study. Age, race, pertinent family history, oncotype score, pathological diagnosis (including size, stage, receptor status, and lymphovascular invasion), operative reports, SLNB results, and ALND results were collected. A group, including experienced medical oncologists and radiation oncologists, were presented the information with SLNB results alone and asked to provide treatment recommendations. The group was then presented the ALND results and asked to provide treatment recommendations. The results were then analyzed for changes in recommendations.
Results: Of the 100 total patients, 53 patients (53.0%) did not have any additional positive lymph nodes on axillary dissection. As a result, there was no change in treatment recommendations for those patients. There were 25 patients (25.0%) with positive axillary lymph node metastasis who did not have modifications to the treatment recommendations. As a result, 78.0% of patients did not have any changes in treatment recommendations following ALND. The treatment recommendations were modified in 23 patients (23.0%) who had additional positive axillary lymph nodes. Of the 23 patients, 13 had mastectomies and were recommended postmastectomy radiation and 4 had changes in recommended chemotherapy based on the ALND results. Of the 10 breast conservation patients, 8 were recommended

supraclavicular radiation, 1 had a change in recommended chemotherapy, and 1 had changes in both chemotherapy and radiation recommendations.
Conclusion: Treatment recommendations were not modified in the majority of patients based on ALND, and over half of the patients had no additional positive lymph nodes. Most of the patients who had changes in therapeutic recommendations were mastectomy patients who needed postmastectomy radiation and only 6 patients had changes in chemotherapy recommendations. This study supports that SLNB alone provides sufficient information for appropriate treatment of breast cancer patients undergoing breast conservation.

0099 Impact of Adjuvant Radiation Therapy on Breast Cancer-Specific Survival in Patients With Triple-Negative Breast Cancer

Julie A. Margenthaler, Amy E Cyr, Imran Zoberi, Feng Gao, Marie Taylor
Washington University School of Medicine, St. Louis, MO, USA

Objectives: Triple-negative breast cancer [(TNBC) = estrogen receptor (ER) negative, progesterone receptor (PR) negative, and Her2 nonamplified] is a unique subtype of breast cancer that generally portends a poorer prognosis. Previous studies of adjuvant radiation therapy, both for breast-conserving therapy (BCT) and following mastectomy in higher risk patients, have not specifically addressed the molecular subtypes of invasive breast cancer. We sought to evaluate the breast cancer-specific survival associated with locoregional treatment of women with TNBC.
Method: We retrospectively identified 468 patients from our prospectively maintained database with a diagnosis of stage I-III TNBC who were treated between 1998 and 2009. Data included patient and tumor characteristics, surgical, systemic, and radiation treatment received, and breast cancer-specific survival. Patients were divided according to receipt of adjuvant radiation therapy following lumpectomy, simple mastectomy, or modified radical mastectomy. Data were compared using chi-square, Fisher exact test, and MANOVA. Kaplan-Meier curves were generated. A p value of <0.05 was considered significant.
Results: The study cohort included 468 patients with a mean age of 54 $\pm$ 13 years with a mean follow-up of 51 $\pm$ 21 months. Of 468 patients, 249 (53%) underwent lumpectomy, 63 (14%) underwent simple mastectomy, and 156 (33%) underwent modified radical mastectomy. Overall, 263 (56%) received adjuvant radiation therapy, including 178 of 249 (71%) following lumpectomy, 13 of 63 (21%) following simple mastectomy, and 72 of 156 (46%) following modified radical mastectomy ($p < 0.0001$). Factors predictive of receipt of adjuvant radiation included type of surgical therapy received (lumpectomy), increasing tumor size, and positive nodal status ($p < 0.05$ for each). Smaller tumor size (T1/T2), negative nodal status, receipt of systemic chemotherapy, and receipt of adjuvant radiation therapy were all significantly associated with improved breast cancer-specific survival ($p < 0.001$ for each). After controlling for all potential confounders in univariate tests, adjuvant radiation therapy was associated with improved breast cancer-specific survival in the overall cohort (HR, 0.46, 95% CI; 0.31-0.68; $p = 0.0001$). When comparing survival by surgical type, receipt of adjuvant radiation therapy significantly improved survival in the lumpectomy group (HR 0.30, 95% CI 0.16-0.58; $p = 0.0004$), but was not significantly associated with improved survival in the simple mastectomy group (HR, 0.3;, 95% CI, 0.05-3.04; $p = 0.36$) or in the modified radical mastectomy group (HR, 0.79; 95% CI, 0.46-1.34; $p = 0.38$).
Conclusions: The breast cancer-specific survival benefit of adjuvant radiation therapy in our cohort of patients with TNBC is attributed mainly to those undergoing BCT. There was no clear benefit to adjuvant radiation therapy following simple mastectomy or modified radical mastectomy. These data warrant validation from prospective trials addressing the issue of locoregional management for patients with TNBC, which may lead to tailored treatment based on the risk of locoregional recurrence in TNBC.

0089 Patient Factors Predictive of Unilateral Mastectomy and Contralateral Prophylactic Mastectomy

Tonya Martin-Dunlap[1], Carla S. Fisher[2], Feng Gao[1], Julie A. Margenthaler[1]
[1]*Washington University School of Medicine, St. Louis, MO, USA,* [2]*University of Pennsylvania, Philadelphia, PA, USA*

Objectives: Recent data suggest an increased rate of mastectomy with or without contralateral prophylactic mastectomy despite potential eligibility for breast conservation. The reasons women choose to undergo mastectomy and/or contralateral prophylactic mastectomy are likely multifactorial and are not clearly understood. We sought to determine the patient and clinical characteristics impacting this decision-making process.

Method: A questionnaire was administered to patients who had undergone previous unilateral mastectomy (UM) or bilateral mastectomy (BM) for breast cancer during the years 2006 to 2010. The survey queried on demographics, surgical choices, and rationale for those choices. A retrospective chart review was performed to determine tumor characteristics and treatment information. The data were analyzed using Fisher exact and chi-square tests. A p value <0.05 was considered significant.
Results: Of 310 patients queried, 175 underwent UM and 135 underwent BM (mean age, 56 ± 12 years). Of the 135 women undergoing BM, 16 (12%) had documented bilateral breast cancer, while 119 (88%) had unilateral breast cancer. Women who were <50 years and Caucasian were more likely to choose BM over UM (p = 0.0001 for both). The choice for UM vs BM was not affected by tumor size, stage, grade, lymph node status, or ER/PR/Her2neu status (p > 0.05 for each). Of 106 patients who underwent genetic testing, 34 (32%) had a BRCA or p53 mutation, while 72 (68%) had no known genetic abnormality. Patients with a known genetic mutation were more likely to undergo BM, compared to those without a known mutation (p = 0.003). Women who underwent BM were more likely to report that they "felt mastectomy would improve my survival" or "felt I would live long enough to be at risk for another cancer" on the questionnaire than those who underwent UM [36 (57%) vs 25 (37%), p = 0.035 and 20 (32%) vs 5 (7%), p = 0.001, respectively]. Patient responses of "a friend/family member encouraged mastectomy" or "want to improve cosmesis/appearance and facilitate reconstruction" were not reported more significantly by either the UM or BM group.
Conclusions: Although tumor characteristics did not impact the decision for UM vs BM in our study population, patient factors were significant. Younger women, Caucasian women, and women with a known hereditary cancer syndrome were significantly more likely to undergo BM compared to UM when undergoing mastectomy for breast cancer. The most common reasons cited for choosing BM over UM were a perceived improved survival and reducing risk for recurrence and/or second primaries. Future studies will focus on the role of patient education in altering this decision-making process.

0097 Does the Volume of Ductal Carcinoma In Situ Impact the Positive Margin Rate in Patients Undergoing Breast Conservation for Invasive Breast Cancer?
Tonya Martin-Dunlap, Fatema Al Mushawah, Feng Gao, Julie A. Margenthaler
Washington University School of Medicine, St. Louis, MO, USA
Objectives: Positive margin status following attempted breast-conserving therapy is a risk factor for local recurrence. Multiple factors have been reported as predictors for positive margins at the time of lumpectomy. The relationship between the volume of ductal carcinoma in situ (DCIS) and the positive margin rate following lumpectomy for invasive breast cancer is unclear. We sought to investigate the impact of DCIS volume on margin status and its relationship with other patient and tumor characteristics.
Method: We retrospectively identified 358 patients from our prospectively maintained database with a diagnosis of stage I-III invasive breast cancer who were treated with breast-conserving therapy from 1999-2009. All patients also had DCIS reported in the final pathology. Data included patient and tumor characteristics, percentage of DCIS in the final lumpectomy specimen (<25%, 26-50%, or >50%), and pathologic outcomes. Margin positivity was defined by the presence of *in situ* or invasive malignancy focally or extensively at any margin. Descriptive statistics were utilized for data summary and data were compared using chi-square and Fisher exact tests. A 2-tailed p value of <0.05 was established for statistical significance.
Results: The study cohort included 358 patients with a mean age of 58 ± 13 years; 260 (73%) were >50 years. The volume of DCIS in lumpectomy specimens was <25% in 296 (83%) patients, 26-50% in 29 (8%) patients, and >50% in 33 (9%) patients. Estrogen receptor (ER) status was significantly associated with DCIS volume, whereby tumors with decreasing DCIS volume were more likely to be ER positive [239 (82%) with <25% DCIS, 21 (72%) with 26-50% DCIS, 22 (67%) with >50% DCIS, p = 0.026]. DCIS volume was not significantly associated with patient age, tumor size, tumor grade, nodal status, tumor stage, progesterone receptor status, or Her2 status (p>0.05). Overall, 137 (38%) patients had 1 or more positive margins, including 97 of 296 (33%) with <25% DCIS volume, 17 of 29 (59%) with 26-50% DCIS volume, and 23 of 33 (70%) with >50% DCIS volume (p < 0.0001). No other patient or tumor characteristics were predictive of a positive margin, though increasing tumor grade did demonstrate a trend toward higher positive margin rates (33%, grade I; 38%, grade II; 45%, grade III; p = 0.07).
Conclusions: The volume of DCIS associated with an invasive breast cancer in the final lumpectomy specimen is a strong predictor of positive surgical margins. Future analyses will focus on the ability of core pathology to provide this information for intraoperative surgical decision-making.

0197 Papillary Lesions on Core Breast Biopsy: Excisional Biopsy for All Patients?
Lee McGhan, Barbara Pockaj, Nabil Wasif, Mariana Giurescu, Ann McCullough, Richard Gray
Mayo Clinic in Arizona, Phoenix, AZ, USA
Objectives: The upstaging rate for papillary lesions diagnosed on core needle biopsy to in situ or invasive cancer is reported between 3 and 14%, due to the relatively limited sample obtained by core needle biopsy. As a result, excisional biopsy is currently recommended following the finding of a papillary lesion on needle biopsy. The study goals were to analyze patients with a diagnosis of a papillary lesion who underwent excisional biopsy and attempt to define a subset of patients with lowest risk of upstaging in whom excisional biopsy may potentially be avoided.
Method: We conducted a retrospective review of patients diagnosed with a papillary lesion on core needle biopsy who underwent excisional biopsy at our institution from 2/2003-7/2011.
Results: Forty-nine patients with a diagnosis of a papillary lesion on core needle biopsy were identified. The median patient age was 63 years (range, 37-88 years). Seven patients (14%) presented with a palpable lesion, and 3 patients (6%) presented with bloody nipple discharge. On imaging, a mass/density was present in the majority of patients (43/49, 88%), with calcifications present in 8 patients (16%). The mean lesion size (by imaging) was 1.07 cm (SEM, 0.08). All patients had multiple core specimens obtained during each biopsy; the mean length of cores was 1.36 cm (SEM, 0.13). Most patients underwent ultrasound-guided biopsy (36/45, 80%). All patients underwent surgical excision, with the majority of patients (41/49, 84%) undergoing radioactive seed-localization of their lesion preoperatively. Fifteen patients (31%) had evidence of atypia on core needle biopsy. Overall, 7 patients were upstaged (14%) to mixed invasive ductal/lobular carcinoma (1 patient, 2%), ductal carcinoma in situ (1 patient, 2%), intraductal papillary carcinoma (3 patients, 6%), and invasive papillary carcinoma (2 patients, 4%). Benign papilloma was present in 28 patients (57%). The upstaging rate for patients with atypia on core biopsy was 5/15 (33%), compared to 2/34 (6%) for patients with no atypia ($p = 0.022$). Among patients without atypia, upstaging for lesions >1 cm vs $\leq$1 cm was 1/10 (10%) vs 1/19 (5%), respectively (p = NS, lesion size unknown in 5 patients). Upstaging for patients < 65 years vs $\geq$ 65 years was 0/16 vs 2/18 (11%), respectively (p = NS). The mean lesion size on imaging was higher among patients that were upstaged vs those that were not upstaged (1.22 cm vs 1.04 cm, respectively, p = NS). There were no instances of locoregional recurrence or distant metastases (median follow-up, 27.6 months; range, 0-104.3 months).
Conclusions: The upstaging rate of papillary lesions diagnosed by core needle biopsy in our cohort was 14%, and patients without atypia had a lower risk of upstaging. No patient <65 years old without atypia was upstaged though the size of the subgroup was small. Based on this and other available data, patients with papillary lesions without atypia diagnosed on core biopsy who are <65 years of age with a lesion <1 cm in size may be offered close clinical follow-up as an alternative to excisional biopsy. Other patients with papillary lesions on core biopsy should undergo excisional biopsy.

0229 Atypical Ductal Hyperplasia on Core Biopsy: An Automatic Trigger for Excisional Biopsy?
Lee McGhan, Barbara Pockaj, Nabil Wasif, Marina Giurescu, Ann McCullough, Richard Gray
Mayo Clinic in Arizona, Phoenix, AZ, USA
Objectives: Atypical ductal hyperplasia (ADH) is discovered in approximately 2-11% of needle biopsies performed for suspicious mammographic findings. Excisional biopsy is recommended following a finding of ADH on needle biopsy because of the risk of upstaging to invasive cancer or ductal carcinoma in situ (DCIS). The study goals were to identify factors associated with risk of upstaging in patients with ADH on core needle biopsy undergoing excisional biopsy.
Method: We conducted a retrospective review of consecutive patients diagnosed with ADH on core needle biopsy, who underwent excisional biopsy at our institution from 5/2000-5/2011.
Results: One hundred thirteen patients with 114 diagnoses of ADH on core needle biopsy were identified. The median patient age was 64 years (range, 37-85 years). On diagnostic imaging, a mass/density or area of distortion was present in 26 cases (23%); calcifications were present in 88 cases (77%). Overall, 82% of lesions were classified radiographically as BI-RADS 4 (suspicious abnormalities). In total, 90 stereotactic biopsies were performed (79%), 22 ultrasound-guided biopsies (19%), and 2 MRI-guided biopsies (1.8%). Stereotactic biopsies for calcifications were performed using either 9-G (67%) or 11-G needles (33%). All patients had multiple core specimens obtained during each biopsy; the mean number of cores obtained was 7.51 (SEM, 0.59); the mean length of cores was 2.51 cm (SEM, 0.10). Following biopsy for calcifications, 63% had residual calcifications postbiopsy. Focal ADH only was present in 52 patients (46%). One hundred ten cases (96%) involved excisional biopsy with radiologic

localization, 1 patient (0.9%) underwent excisional biopsy without radiologic localization, and 3 patients (3%) underwent mastectomy. Twenty lesions (18%) were upstaged to either infiltrating carcinoma (n = 6, 30%) or DCIS (n = 14, 70%). Residual ADH was present in 43 biopsies (38%). On univariate analysis, significant variables associated with upstaging included age >50 years, a mass lesion on imaging, and shorter length of biopsy core (all $p < 0.05$). No patient $\leq$50 years of age (n = 18) was upstaged. The rate of upstaging among patients with no residual calcifications postbiopsy and focal atypia only on core biopsy (1/12, 8%), compared with patients with residual calcifications +/- focal atypia (10/60, 17%), $p = 0.667$. Palpable disease at presentation and larger extent of lesion on initial screening imaging were other nonsignificant factors associated with upstaging of ADH (Table 1). For calcifications, neither the biopsy needle size nor presence of residual calcifications was associated with upstaging. Three of 95 patients who were not upstaged (3%) developed ipsilateral carcinoma (2 DCIS and 1 infiltrating ductal carcinoma) at a median time of 37 months. No patient upstaged to DCIS/invasive carcinoma experienced a local, regional, or distant recurrence (median follow-up, 32 months).

Table 1. Univariate Analysis of Factors Associated With Upstaging

Variable		Upstaged (n = 20)	Not upstaged (n = 94)	P value
Age (mean, yr)		66.9	61.2	0.034
Age group	> 50 yr	20 (21%)	76 (79%)	0.039
	$\leq$ 50 yr	0	18 (100%)	
Previous history of cancer or DCIS		1 (5%)	8 (8%)	1.000
Palpable disease		2 (10%)	2 (2.1%)	0.141
Mass on imaging		8 (40%)	18 (19%)	0.044
Focal ADH		7 (35%)	45 (47%)	0.116
Residual calcifications postbiopsy (n = 71)	Yes	8 (17%)	38 (83%)	1.000
	No	4 (15%)	23 (85%)	
No residual calcifications postbiopsy AND focal atypia only (n = 12)		1 (8%)	11 (92%)	0.667

Conclusions: The rate of upstaging when ADH is diagnosed by core needle biopsy at our institution is 18%, and routine excisional biopsy is currently recommended. Younger patients with focal atypia only and no residual calcifications postbiopsy may represent a lower risk group who could potentially avoid excisional biopsy, but larger studies would be needed to validate this.

0122 Risk of Lymphedema After Prophylactic Mastectomy

Cynthia Miller, Melissa Skolny, Lauren Jammallo, Nora Horick, Jean O'Toole, Kevin Hughes, Michele Gadd, Barbara Smith, Alphonse Taghian, Michelle Specht
Massachusetts General Hospital, Boston, MA, USA

Objectives: An increasing number of women diagnosed with or at high risk for breast cancer choose bilateral mastectomy. Sentinel lymph node biopsy (SLNB) may be considered at the time of prophylactic mastectomy in order to stage the axilla in case an occult cancer is discovered. However, it is unknown whether adding SLNB increases the risk for developing lymphedema. We sought to determine the risk of lymphedema in patients who underwent bilateral mastectomy with and without nodal evaluation.

Method: Sixty-four patients who underwent bilateral mastectomy were identified from a cohort of patients who are followed prospectively for lymphedema at our institution. Patients were treated with bilateral mastectomy from 2007 to 2011 with a median follow-up of 21 months (range, 3–56). Bilateral arm volume measurements were performed via perometry for each patient preoperatively and at least 3 months after surgery. Each mastectomy side was analyzed individually, resulting in a total of 128 sides: 22/128 (17%) without axillary surgery, 78/128 (61%) with SLNB, and 28/128 (22%) with axillary lymph node dissection (ALND). The weight-adjusted change (WAC) of unilateral arm volumes was calculated according to the formula $WAC = (A2*W1)/(W2*A1) - 1$, where A1 is preoperative arm volume, A2 is postoperative arm volume, and W1 and W2 are the patient's weights at these time points. Lymphedema was defined as WAC ≥ 10% occurring >3 months from surgery. Sixty of 64 (93.8%) patients also filled out the

Lymphedema Evaluation Following Treatment for Breast Cancer (LEFT-BC) questionnaire to evaluate symptoms associated with lymphedema within 30 days of their last arm measurement. Kaplan-Meier curves and a univariate analysis were performed to evaluate risk factors for lymphedema.
Results: Patients who underwent mastectomy with SLNB were not at a higher risk for lymphedema compared with those who underwent mastectomy alone, 0/21 (0%) compared with 1/78 (1.3%). Seven of 28 (25%) patients who underwent modified radical mastectomy developed lymphedema, a significantly higher risk compared with both mastectomy alone and mastectomy with SLNB (p = 0.0005) (Figure 1). Questionnaire responses indicated that 6/128 sides had received treatment for lymphedema, all of whom had undergone ALND. Patients who underwent mastectomy with SLNB or mastectomy with ALND were more likely to self-report symptoms associated with swelling of their upper extremity compared with patients who underwent mastectomy without nodal evaluation (Table 1).

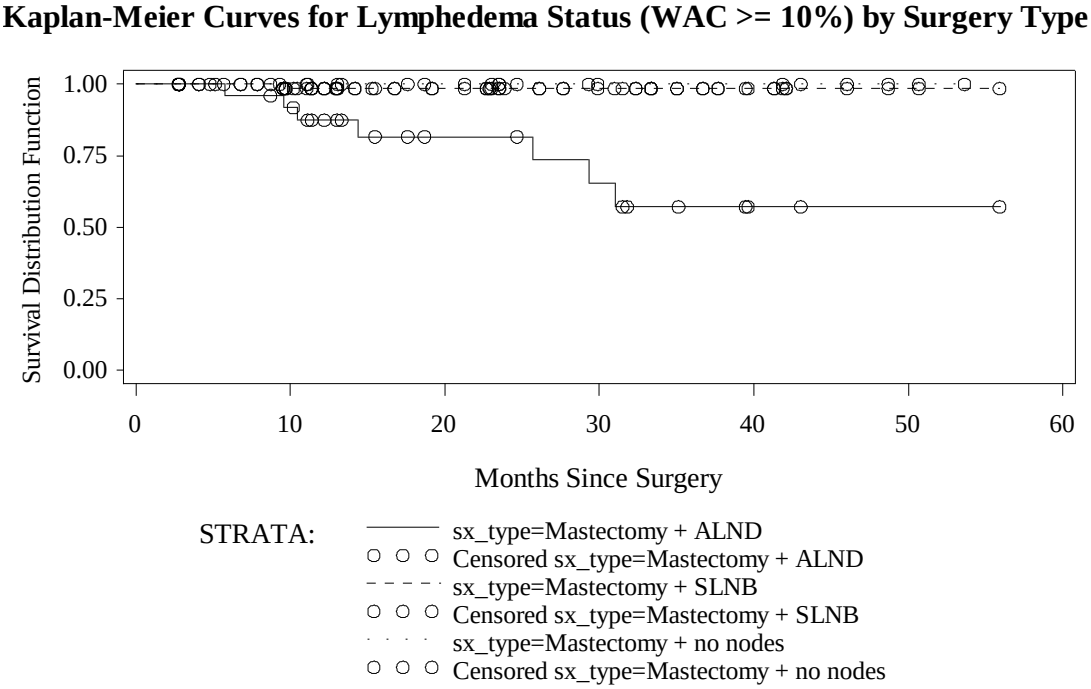


Figure 1

Table 1. Reporting of Lymphedema-Related Symptoms

	Arm/Shoulder/ Neck Felt Larger	Sleeve/ Sleeve Cuff/Ring Felt Tighter	Mild/Moderate Swelling/Heaviness in Arm, Breast, or Chest
Mastectomy + no nodes	**0.0%** (0/21)	**0.0%** (0/21)	**0.0%** (0/21)
Mastectomy + SLNB	**4.2%** (3/72)	**12.5%** (9/72)	**18.1%** (13/72)
Mastectomy + ALND	**26.0%** (7/27)	**22.2%** (6/27)	**26.0%** (7/27)

Conclusions: Addition of SLNB at the time of prophylactic mastectomy will not increase the risk of measured lymphedema. However, mastectomy with SLNB does increase perceptions of swelling in the affected upper extremity and therefore may decrease overall quality of life after prophylactic mastectomy.

0155 Trends of Breast Cancer Patients Presenting to a County Medical Facility After the Start of the 2008 Recession

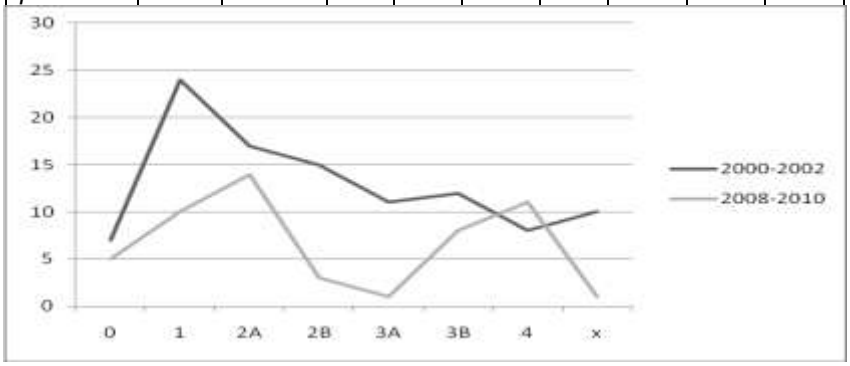
Aileen Murphy, Francesca Hoehne, Victor Sorensen
Kern Medical Center, Bakersfield, CA, USA

Objectives: The 2008/2009 recession resulted in a peak unemployment rate of 10.1% in September 2009 and subsequently impacted health care. With the increase in patients without health care coverage, is breast cancer screening being impacted? The purpose of this study was to evaluate the trends of the breast cancer patient population at a county medical center during the past decade, comparing the trends before and after the beginning of the recession of 2008.

Method: A chart review of patients diagnosed with breast cancer from January 2000 to December 2010. Patients in the cancer registry were identified and breast cancer staging was determined. The age and staging of patients during 2000-2002 and 2008-2010 were compared. Two hundred forty breast cancer patients treated at our county facility were identified from the cancer registry. One hundred three patients were treated during 2000-2002, pre-recession group (group 1), and 53 patients were treated during 2008-2010, postrecession group (group 2). Unpaired Student *t* test was used for statistical analysis to determine significant difference.

Results:

Stage	Age	DCIS	1	2A	2B	3A	3B	4	x
Group 1	52	7	24	17	15	11	12	8	10
Group 2	49	5	10	14	3	1	8	11	1
p value	.33	.52	.06	.65	.03	.02	.37	.54	



Conclusions: The 2008/2009 recession resulted in a trend toward patients with government insurance presenting with advanced staging and younger age when compared to 2000-2002 patient population, although not statistically significant. Group 1 resulted in a peak distribution with stage 1, whereas group 2 showed a bimodal distribution of both early and late staging of breast cancer. This shift in distribution may be the result of the recession and the increasing number of government insurance carriers. We recognize this development and the need for more opportunities of breast screening within the government insurance carriers.

0121 Does Race Impact Tumor Histopathology, Progression, and Treatment in DCIS? A 10-Year Single-Institution Study

Vijayashree Murthy[1], Lauren Sparber[1], Amit Kaushal[1,3], Umashankar Ballehaninna[1], Sachin Patil[1], Ronald Chamberlain[1,2]
[1]Saint Barnabas Medical Center, Livingston, NJ, USA, [2]University of Medicine and Dentistry of New Jersey, Newark, NJ, USA, [3]Saint George's University School of Medicine, Saint George, Grenada

Objectives: Screening mammography has led to a marked reduction in the average size of newly detected invasive breast tumors in United States, but simultaneously there has been an increase in the incidence of ductal carcinoma in situ (DCIS). Prognostic indicators, such as the Van Nuys Prognostic Index (VNPI), use age, size, grade, comedonecrosis, and margins to predict DCIS recurrence rates. However, receptor status, family history of breast cancer, and BRCA gene mutations in different races and their correlation with progression in DCIS has not been well investigated. This study aimed to detect racial trends in histology, tumor characteristics, and patient management for DCIS patients.

Method: Between February 2000 and November 2011, 565 patients with DCIS either screen detected (N = 482) or with palpable masses (N = 56) who underwent surgical resection were identified. Twenty-seven patients had insufficient information on mode of detection only. However demographic and clinicopathological data was collected for all 565 patients and Student *t* test and chi-square tests were performed for continuous and categorical variables, to evaluate patient and tumor factors with respect to size, type, presence or absence of necrosis, palpability, surgical management, and receptor/HER2 *neu* status in different races.
Results: Median patient age was 57 years and median tumor size was 1 cm. Screening mammography was the most common mode of detection across all groups and highest among African American (87.5 %). Of the Hispanic women, 11.1% had palpable lumps. Family history of first-degree relative with breast cancer was highest among Caucasians (14.7%), followed by Hispanics (11.1%). DCIS with microinvasion rates were highest among African Americans (18.8%) and Asians (16%), while high-grade DCIS (48%) and comedonecrosis (80%) were highest in Asians. Seventy-six percent of Asian women opted for mastectomy, while 31.3% of African American women underwent lumpectomy. However, none of the above factors were significantly different between the various ethnic groups studied. The rates of multifocality (50%; $p < 0.04$) and ER positivity (92.3%; $p < 0.03$) of DCIS were found to be significantly higher in Hispanic women compared to other races. There was significant difference in VNPI index among the races studied ($p < 0.001$), however no significant difference in PR and HER 2 *neu* status in the various ethnic groups.
Conclusions: Overall screen-detected DCIS was more common than palpable DCIS. A greater incidence of lumpectomy was seen among African American and Hispanic women. Racial variations in tumor characteristics were identified among patients treated for DCIS based on VNPI index and ER status. However, additional studies with larger sample size are required to validate the findings of this study.

0113 Effect of Postmastectomy Radiotherapy on Tumor Recurrence Rate in Patients With T1-T2 Disease and 1-3 Positive Nodes
Archit Naik, Kim Hirshfield, Atif Khan, Thomas Kearney, Sharad Goyal, Bruce Haffty, Laurie Kirstein
Cancer Institute of New Jersey/Robert Wood Johnson Medical School, NJ, USA
Objectives: The role of postmastectomy radiotherapy (PMRT) in the subset of breast cancer patients with T1 or T2 disease and 1-3 positive axillary lymph nodes remains controversial. For this group of patients, National Cancer Center Guidelines suggest a discussion on an individual basis, without clear treatment recommendations. We sought to examine the effect of PMRT in patients with T1/T2 breast cancers with 1-3 positive lymph nodes with respect to recurrence rate and mortality.
Method: A retrospective IRB-approved chart review of breast cancer patients with T1 or T2 lesions and 1-3 positive axillary lymph nodes from 1986 and 2004 was performed. Eighty-four patients were identified in this group. The patients were subdivided into 2 groups: (+RT) that received PMRT (n = 38) and (-RT) that did not receive PMRT (n = 46). Patient and tumor- related characteristics were examined. A comparison was performed between the groups with respect to recurrence rates and mortality, as well as time to recurrence.
Results: There were 38 patients that received PMRT, and 46 patients that did not receive PMRT. The groups were similar with respect to age at diagnosis and ER positivity. There were differences in the groups with respect to number of positive nodes (Table 1), with higher nodal positivity leading to more PMRT. In the (+RT) group, 10/38 (26%) patients had a recurrence, with a median time to recurrence of 49.6 months. In the (-RT) group, 9/46 (20%) patients had a recurrence, with a median time to recurrence of 46.8 months. There was no statistically significant difference in recurrence rates between the 2 groups ($p = 0.6$) (Table 2). Further, there was no significant difference in site of recurrence, with distant recurrence being the most common: (+RT) 6/11, (-RT) 9/11, ($p = 0.3$). Mortality rate was 24% (9/38) in the (+RT) group, compared to 20% (9/46) in the (-RT) group. Again, there was no statistically significant difference in the mortality rate between the 2 groups ($p = 0.7$).
Conclusions: In our study, we did not find a significant difference in tumor recurrence and mortality rate in patients with a T1-T2 breast cancer and 1-3 positive lymph nodes, regardless of whether or not they received postmastectomy radiation. However, given that the number of subjects was small and there is a potential effect of further confounders, future studies with larger study groups need to be conducted in order to draw definitive conclusions.

Table 1. Number of Positive Nodes and Use of Postmastectomy Radiation

Number of Positive Lymph Nodes	Postmastectomy Radiation	No Postmastectomy Radiation
1	12 (31.5%)	24 (52%)
2	12 (31.5)	16 (35%)
3	14 (37%)	6 (13%)

Table 2. Use of Postmastectomy Radiation and Recurrence Rate

	Postmastectomy Radiation	No Postmastectomy Radiation
Recurrence	11	11
No Recurrence	27	35
		P = 0.6 (n.s.)

0081 Diagnostic Work-Up of Breast Cancer Patients Delays Definitive Surgery in Canada

Carolyn Nessim, Julian Winocour, Diana Holloway, Claire Holloway
Sunnybrook Health Sciences Centre/Odette Cancer Centre/University of Toronto, Toronto, ON, Canada

Objectives: Surgical wait times in Ontario are calculated from the time of completion of diagnostic evaluation to the time of definitive surgery. For patients with breast cancer in particular, an extensive diagnostic work-up is required and is not captured in these calculated wait times. We sought to examine the overall wait time, from the patient's perspective, from identification of an abnormality to definitive treatment. The objective was to describe those aspects of the diagnostic pathway that comprise the overall wait time and identify those factors which contribute to overall wait time in women with breast cancer.

Method: A retrospective chart review in a tertiary care center was performed identifying all patients who had breast surgery for invasive carcinoma and DCIS from January 2009 to December 2010. We excluded all patients who had definitive surgery elsewhere, received neo-adjuvant chemotherapy, opted for immediate breast reconstruction, required treatment for another life-threatening condition before their breast cancer treatment, or refused timely surgical treatment. We recorded the dates of first imaging abnormality, first biopsy, subsequent imaging and biopsy, first medical consult, first surgical consult, and date of surgery. Clinical data that might influence these times was then extracted, including family history, menopausal status, histology, number of visits to radiology for imaging, number of biopsies, and use of MRI. Wait times were calculated and factors associated with wait time were described.

Results: A total of 221 patients were analyzed. Median age was 57 years. Twenty-four percent of patients had in situ disease and 76% had invasive disease. The median time between first imaging abnormality and definitive surgery was 78 days. The time from first imaging abnormality to first surgical consultation was 48 days. Time from first surgical consult to surgery was significantly shorter with a median of 25 days ($p < 0.05$). The use of MRI significantly increased the time from first surgical consult to surgery by 6 days ($p < 0.05$). In this cohort, 51% had an MRI. These patients were more likely to be pre-/peri-menopausal (48% vs 24%), have a positive family history (46% vs 30%), and have an invasive lobular carcinoma (12% vs 6%). They were also more likely to have ≥2 biopsies (32% vs 10%) and to have ≥3 visits to radiology for imaging (35% vs 0.9%).

Conclusions: Current surgical wait time data in Ontario do not capture the entire wait time involved for a patient with breast cancer, from diagnosis to definitive treatment. Extensive diagnostic work-up and time to consultation to a surgeon are important factors creating delays in time to definitive surgery. MRI significantly incurs delays from time of surgical consultation to surgery. A more integrated approach using a rapid diagnostic clinic for tissue diagnosis initially, followed by facilitated preoperative evaluation is needed to decrease wait times for breast evaluation experienced by patients.

0263 Efficacy of Postmastectomy Radiation Among Women of Premenopausal Age With 1-3 Lymph Node Involvement

Ina A Nevdakh[5,6], James Barnett[1], Tammy De La Melena[2], Gregory Patton[2], David Gannett[3], Bruce Webber[3], Nathalie Johnson[4]

[1]Providence Health Systems Oregon, Regional Cancer Registry, Portland, OR, USA, [2]Compass Oncology, US Oncology Group, Portland, OR, USA, [3]Oregon Clinic, Portland, OR, USA, [4]Legacy Health Systems, Portland, OR, USA, [5]Providence Health Systems Oregon, St. Vincent Hospital, Portland, OR, USA, [6]OHSU, Portland, OR, USA

Objectives: Our objective is to retrospectively compare rates of local-regional recurrence (LRR), distant recurrence, and survival between premenopausal women who underwent adjuvant chemotherapy (CHT) + postmastectomy radiation (PMRT) to those who omitted PMRT. While both CHT and PMRT therapy have shown to be beneficial in postmenopausal women with locally advanced disease who undergo mastectomy, fewer studies have been done in premenopausal women. The efficacy of PMRT in all women who underwent mastectomy with greater than 4 positive nodes is well documented in preventing LRR, but its expanded use in those with only 1-3 positive nodes has been controversial. PMRT has demonstrated decreased LRR and overall survival in some studies on premenopausal women with 1-3 positive nodes after mastectomy, yet has shown less of an effect on long-term survival and overall mortality.

Method: A retrospective data review of the cancer registry from a community hospital from January 2000 to September 2011 was performed. Inclusion criteria were women who underwent mastectomy for invasive breast cancer and were found to have 1-3 positive lymph nodes. Factors considered: patients treated with or without postmastectomy radiation therapy; ER/PR status; rates of locoregional recurrence; overall survival. Patients were divided into 2 groups, those receiving chemotherapy alone (CHT) and those who underwent chemotherapy and PMRT. These were further subdivided into groups of women aged 50 or less and those older than 50. The rates of disease-free survival and recurrence rates were then calculated and compared, as was the overall survival.

Results: Seven hundred thirty-seven women underwent mastectomy and were found to have 1 to 3 positive axillary nodes. Two hundred fifty-two patients were aged 50 or less at diagnosis and presumed to be premenopausal. Two patients were lost to follow-up, therefore, 134 (53.6%) women underwent CHT and 116 (46.4%) underwent CHT/PMRT, with 5-yr survival rates between these at 91.8% vs 93.1% ($p = 0.78$). For those over 50, there were 356 (73.6%) patients treated with CHT only and 128 (26.4%) with CHT/PMRT. Eight were lost to follow-up. The 5-yr survival rates for these 2 groups over age 50 were 85.4% and 86.7%, respectively ($p = 0.99$). With respect to disease-free survival and recurrence, data was missing in 19 of the younger group. Observed recurrence rates at 5 yr were 11.8% among 127 patients with CHT alone vs 9.4% of 106 patients treated with CHT/PMRT ($p = 0.36$). In the women-over-50 groups, recurrence rates at 5 yr were 7.3% for CHT alone vs 6.8% for CHT/PMRT ($p = 0.99$). There was insufficient data in 31 patients over age 50. Data was incomplete for ER/PR status.

Conclusions: Upon review of our retrospective data of 727 patients, PMRT in patients with fewer than 4 positive lymph nodes shows no statistical benefit over CHT alone in either age group. Review of other prognostic factors found to have an effect on outcomes, as well as subjective factors, may demonstrate the previously published benefit among subgroups of these patients. Further studies revisiting these treatment strategies to validate the use of postmastectomy XRT in women with limited nodal disease should be considered.

0091 Comparison of Molecular Subtyping With BluePrint and MammaPrint to Local IHC/FISH-Based Subtype Classification in 133 US and EU Breast Cancer Patients

Bichlien Nguyen[1], Pino Cusumano[2], Ken Deck[3], Deborah Kerlin[4], Augustin Garcia[5], Julie Barone[6], Edgardo Rivera[7], Katherine Yao[8], Lisette Stork-Sloots[9], Daniele Generali[10]

[1]Long Beach Memorial Health Care, Long Beach, CA, USA, [2]CHC, Liege, Belgium, [3]Saddleback Memorial Medical Center, Laguna Hills, CA, USA, [4]John Muir, Walnut Creek, CA, USA, [5]University of Southern California, Los Angeles, CA, USA, [6]Comprehensive Breast Care of San Diego and Sharp Memorial Hospital, San Diego, CA, USA, [7]The Methodist Hospital/Weill Cornell University, Houston, TX, USA, [8]North Shore University Health System, Chicago, IL, USA, [9]AgendiaInc, Irvine, CA, USA, [10]Istituti Ospitalieri di Cremona, Cremona, Italy

Objectives: Molecular subtypes in breast cancer are increasingly important in guiding adjuvant treatment decisions. We compared molecular subtyping by standard local practice with 3 microarray-based assays:

BluePrint, which classifies samples into luminal, basal and HER2 types; MammaPrint, which classifies luminal patients into high-risk luminal B and low-risk luminal A; and TargetPrint which measures mRNA levels of estrogen receptor (ER), progesterone receptor (PR), and Her2neu (Her2).
Method: BluePrint, MammaPrint, and TargetPrint were performed on fresh tumor samples from 133 breast cancer patients (T1-4, N0-2) between Dec 2008 and July 2011 at 11 institutions in the U.S. and Europe. ER, PR, and Her2 IHC/FISH assessments were performed according to local practice at each institution. FISH was performed on 11 Her2neu samples if Her2 2+.
Results: Concordance of TargetPrint with IHC/FISH is 97% for ER, 78% for PR, and 95% for Her2.

Table 1. Concordance of BluePrint with IHC/FISH Subtyping is 93% for Luminal Types, 97% for Her2 Type, and 93% for Basal Type

		IHC/FISH Subtyping*			
		HR+, Her2- Luminal	**HR-, Her2- Basal**	**Her2+ Her2**	**Total**
BluePrint	Luminal type	106	1	2	109
	Basal type	6	7	2	15
	HER2 type	0	0	6	6
	Total	112	8	10	130

*3 patients, no IHC/FISH data.

Table 2. Concordance of Ki67 and MammaPrint is 69%

		IHC/FISH*		
		Luminal A HR+, Her2-, ki67 < 14%	**Luminal B HR+, Her2-, ki67 ≥14%**	**Total**
BluePrint	Luminal A MammaPrint Low Risk	26	9	35
	Luminal B MammaPrint High Risk	12	20	32
	Total	38	29	67

*Ki-67 unknown for 39 concordant luminal patients

Conclusions: There is high concordance between IHC/FISH and TargetPrint. There is high concordance with IHC/FISH subtyping and BluePrint. Concordance between MammaPrint and Ki67 was not high. Implementation of TargetPrint, BluePrint, and MammaPrint may improve the clinical management of breast cancer patients.

0225 Demand for Breast-Conserving Surgery Among Male Breast Cancer Patients
Trang Nguyen, Michael Cowher
Cleveland Clinic, Cleveland, OH, USA
Objectives: Mastectomy has traditionally been the surgical treatment of male breast cancer. The authors found scant published literature about both requests for and the feasibility of breast-conserving therapy (BCT) in male breast cancer. Our objective is to review the amount of interest expressed by newly diagnosed male breast cancer patients regarding BCT and to describe the outcomes in men who chose conservation.
Method: An IRB-approved retrospective chart review was performed of all newly diagnosed male breast cancer patients with resectable disease who presented to our breast center between 2008 and 2011. Records were analyzed for requests by patients for breast-conserving therapy or breast reconstruction.
Results: Between 2008 and 2011, 9 male patients presented to our breast center with a new diagnosis of resectable breast cancer. Three of these were diagnosed with invasive papillary carcinoma, while the others had ductal carcinoma. Four of the patients (44%) voiced concern regarding their appearance and requested breast-conserving surgery or breast reconstruction. Two of these patients had additional consultation with a plastic surgeon. One patient initially refused recommended mastectomy and underwent partial mastectomy, but positive margins prompted a completion mastectomy.

Conclusions: While mastectomy is the traditional local therapy for male breast cancer, desire for breast conservation and/or reconstruction is voiced by a significant percentage of male patients. To our knowledge, this is the first study evaluating whether desire to preserve their breast is a concern for male breast cancer patients. Although most male patients are not candidates for breast conservation therapy, issues pertaining to self-image should be addressed during consultation and BCT or reconstruction should be considered for those who are candidates.

0221 Preoperative Axillary Ultrasound and Fine Needle Aspiration Is an Accurate Method of Assessing Preoperative Lymph Node Status in Breast Cancer Patients

Ashling O'Connor, Sue MacMaster, Gopal Vijayaraghavan, Nilima Patwardhan, Ann Larkin, Robert Quinlan

University of Massachusetts, Worcester, MA, USA

Objectives: Lymph node status is one of the most important prognostic indicators in breast cancer. Clinical examination alone is a poor assessment tool. Accurate documentation of lymph node status preoperatively can negate the need for sentinel lymph node biopsy, proceeding directly to axillary node dissection instead. The aim of this study was to assess the efficacy of axillary ultrasound and fine needle aspiration preoperatively by comparing suspicious and negative nodes found on ultrasound to the final pathological diagnosis following axillary lymph node dissection. All suspicious nodes seen on ultrasound underwent fine needle aspiration and cytological examination.

Method: A retrospective review was carried out on 103 cases of breast cancer with preoperative axillary ultrasound evaluation. Of these, 54 suspicious axillary ultrasound patients were identified who subsequently underwent fine needle aspiration biopsy. The final pathology was correlated with radiological and pathological findings.

Results: Thirty-eight patients had suspicious ultrasound, positive fine needle aspiration, and positive final pathology. Fourteen patients had a positive ultrasound and negative fine needle aspiration; of these, only 5 had a truly positive node at axillary node dissection. Two had indeterminate biopsies that ultimately turned out to be positive. The overall sensitivity was found to be 85.7% and specificity of 84.4%. Combining ultrasound and FNA yielded a positive predictive value of 85.7% and an accuracy of 85.1%. None of the 9 patients with suspicious ultrasounds and negative sentinel lymph node dissection had extracapsular nodal extension. Nine patients had negative ultrasounds and subsequent positive nodes on axillary dissection.Using this method, 38 patients may have avoided sentinel lymph node biopsies and their accompanying preoperative injection in place of the much simpler and lower cost axillary ultrasound and fine needle aspiration biopsy.

Conclusions: The combination of preoperative axillary ultrasound and fine needle aspiration biopsy is a sensitive and specific preoperative assessment tool, which may help to reduce the number of operative lymph node procedures.

0086 Acellular Dermal Matrix As a Volume Replacement for Immediate Reconstruction of Lumpectomy Cavities: A Pilot Study

Haydee Ojeda[1], Chris Tokin[1], Ok Hee Woo[3,1], Tiya Sinha[1], James Chao[1], Steven Chen[2]

[1]University of California San Diego, San Diego, CA, USA, [2]City of Hope National Medical Center, Duarte, CA, USA, [3]Korean University Guro Hospital, Seoul Korea, Republic of Korea

Objectives: Breast conservation operations are the most common surgical treatment for breast cancer; however, approximately one third of women have a poor cosmetic outcome. Oncoplastics is a solution for some, but not all patients are good candidates. The use of an acellular dermal matrix (ADM) may provide a volume substitute in these cases. The objective of this study is to examine if breast volume can be maintained by the addition of ADM and its effect after lumpectomy plus radiation.

Method: We retrospectively reviewed our institution's experience in ADM placement during lumpectomy operations for breast cancer. A 6- x12-cm piece of alloderm was accordion-folded and secured with 2-0 vicryl to the pectoralis major muscle immediately following the completion of the lumpectomy. We reviewed patient records and 1-year follow-up mammograms to calculate breast volume. Controls were drawn from the same time period matched on type of surgery and use of radiation. Wilcoxon rank sum tests were used to compare baseline values and percent change in breast volumes.

Results: We identified 28 cases that had ADM placed during lumpectomy operations and had whole-breast radiation between 2008 and 2010. Median age was 56, median tumor size was 2.4 cm, and median specimen volume 96 cm^3. Mammograms were available on 18 cases and were matched with 23

control patients. Mean percent change in breast volume was 12% for ADM group and 15% for control (p = 0.5). Nine of 18 (50%) patients in the ADM group and 15 of 23 (65.2%) patients in the control group had a reduction of 15% or more in breast volume (p = 0.36).
Conclusions: This pilot study demonstrates a trend toward maintenance of breast volume in patients having lumpectomy plus radiation. Breast volume as measured by compressed mammogram is estimation of overall breast size but not necessarily cosmetic appearance. This preliminary data warrants further prospective study of cosmetic outcome utilizing this technique, as well as continued follow-up, to assess longer term outcomes.

0144 The Reverse Acellular Dermal Matrix Sling – A Reconstructive Solution for Patients with Obesity and Macromastia
Anke Ott Young
New England Center for Oncoplastic Surgery, New Canaan, CT, USA
Objectives: With the increasing incidence of obesity the number of patients who present for mastectomy reconstruction with severe macromastia is rising steadily. Patients with a very high BMI are often poor candidates for autologous reconstruction. Traditional implant-based reconstructions frequently result in a flat poorly projected breast mount. Wise pattern mastectomy incisions improve the cosmetic results; however, breast projection is compromised by the relatively small size of the pectoralis major muscle covering the superior implant pole, in comparison to the large implant size required to achieve an adequate breast mount. We describe a new technique using the large skin surplus of the lower breast pole as a de-epithelialised flap in conjunction with a superior acellular dermal matrix sling to line the implant pocket without the use of the pectoralis muscle.
Method: To investigate the safety and efficiency of this method, we reviewed the medical records of 28 patients with a BMI more then 35, who underwent 48 implant-based immediate mastectomy reconstructions. All procedures were performed by the senior author and follow-up ranged from 6 weeks to 51 months. The implant size ranged from 550 to 800 cc; high-profile gel implants and shaped saline implants were used. The charts were analyzed for the occurrence of complications, such as infection, seroma, mastectomy flap necrosis, capsular contracture, and implant loss. All patients were asked to rate their result as poor, good, or excellent.
Results: In 48 reconstructed breasts, we encountered 4 cases of limited mastectomy flap epidermolysis and 1 case of flap necrosis all treated with dressing changes, 1 case of cellulitis treated with oral antibiotics, 2 cases of Baker II capsular contracture, and 1 case of delayed implant removal after radiation treatment for an internal mammary lymph node recurrence. In terms of patient satisfaction, 20 patients rated their results as excellent; 8, good; none, poor. Satisfaction rates were highest in the bilateral mastectomy group.
Conclusions: Our results compare favourable with data published in the literature, patient satisfaction is high and complication rates are reasonable in this high-risk population that historically has been a challenge for the reconstructive surgeon.

0185 Impact of Preoperative Breast MRI on Surgical Plan of Care for Breast Cancer Patients
Ali Pandamouz[1], Monica Delbridge[2], Haiyan Cui[3], Rebecca Viscusi[4], Michele Ley[3], Marisa Borders[5], Kimberly Fitzpatrick[5], Amy Waer[4], Julie Lang[4]
[1]The University of Arizona College of Medicine, Tucson, AZ, USA, [2]The University of Arizona Department of Surgery, Division of Surgical Oncology, Tucson, AZ, USA, [3]Arizona Cancer Center, Tucson, AZ, USA, [4]The University of Arizona Department of Surgery, Division of Surgical Oncology; Arizona Cancer Center, Tucson, AZ, USA, [5]The University of Arizona Medical Center Department of Radiology, Tucson, AZ, USA
Objectives: We hypothesized that preoperative breast MRI did not reduce the re-excision rate after breast-conserving surgery (BCS). We sought to examine patterns of MRI use and the impact of MRI results on surgical treatment at our institution.
Method: We retrospectively reviewed the records of 235 patients with stage 0 to III breast cancer who underwent surgery from March 2007 to June 2011. We recorded clinicopathologic data for each patient, including use of MRI, performance of re-excisions in BCS, type of surgery, accuracy of MRI tumor size assessment compared to clinical exam and pathology, accuracy of any additional core biopsies indicated by MRI, and performance of contralateral prophylactic mastectomy (CPM). Fisher exact test, Spearman correlation, and Wilcoxon signed rank test were employed for statistical analyses.

Results: Fifty-six patients (24%) had preoperative MRI, while 179 patients (76%) did not. There was no significant difference in the mean age and ethnicity among patients, based on use of MRI ($p = 0.87$ and $p = 0.90$, respectively). Patients who underwent BRCA testing were more likely to have a breast MRI ($p = 0.01$), although BRCA positive status was balanced between the 2 groups. Premenopausal patients were not more likely to have breast MRI than postmenopausal patients ($p = 0.26$). The mean pathologic tumor size for patients who had MRI was significantly smaller than those with no MRI ($p = 0.03$), while the difference in clinical tumor size estimation was not significantly different ($p = 0.53$). Our study included patients with invasive ($n = 179$) and in situ ($n = 56$) breast cancer. In the invasive group, patients with MRI were significantly more likely to undergo total mastectomy than patients with no MRI ($p = 0.03$). In the in situ group, MRI was not associated with higher rates of total mastectomy ($p = 0.30$). One hundred fifty-seven patients were treated by BCS and 78 patients were treated by total mastectomy. Of BCS patients, 17.2% required re-excision for margin control; use of MRI did not affect re-excision rates in BCS ($p = 0.30$). In patients with invasive disease treated without neoadjuvant chemotherapy, clinical and MRI tumor size were correlated with surgical pathology findings; clinical assessment had a higher correlation ($R^2 = 0.75$, $p < 0.0001$) than did MRI assessment ($R^2 = 0.36$, $p = 0.05$). There was no significant difference in CPM rates among patients based on use of MRI ($p = 0.67$). MRI indicated the need for 13 additional biopsies, preoperatively in 9 patients (13.8% of patients in the MRI group). The sensitivity, specificity, and accuracy of MRI for detecting additional lesions in the invasive group were 73.4%, 80.8%, and 77.8%, respectively. The in situ group had a sensitivity of 60.0%, specificity of 73.3%, and accuracy of 70.0% for additional lesions identified by preoperative breast MRI.
Conclusions: Preoperative breast MRI had no impact on re-excision rates in BCS. Patients who had a preoperative MRI were more likely to undergo total mastectomy than those who did not have MRI. Preoperative MRI was not associated with use of CPM. Performance of MRI resulted in additional core biopsies for 13.8% of patients and provided acceptable accuracy for the additional MRI-detected lesions.

0076 A Defined Extract of American Ginseng Reduces Biomarkers of Inflammation in Breast Cancer Patients

Elizabeth Peralta[1,2], Jennifer Steiman[2]
[1]*Sutter Pacific Medical Foundation, Santa Rosa, CA, USA,* [2]*Southern Illinois University School of Medicine, Springfield, IL, USA*

Objectives: Our previous in vitro and animal model studies have demonstrated inhibition of human breast cancer cells using a specific lyophilized extract of American ginseng (LEAG). This extract has been fully characterized and an investigational new drug number (IND) has been assigned by the FDA. The objective of this study is to identify potential mechanisms of action from among the known effects of ginseng, such as downregulation of the pro-inflammatory signal protein NFkB and regulation of hyperglycemia associated with the inflammatory state. Biomarkers that potentially relate inflammation and breast cancer include the cytokines TNF-alpha and IL-8 and the tissue proteins COX-2 and Ki-67. Our hypothesis is that LEAG will decrease biomarkers of breast cancer proliferation in women who take it prior to surgery.
Method: A prospective, phase II open-label drug trial of LEAG assessing the biomarkers pre- and post-treatment has been opened. Patient enrollment was self-directed with eligibility criteria including females aged greater than 18, breast cancer (invasive or ductal carcinoma in situ) of size 1 cm or greater; controlled hypertension or diabetes, if present; and the absence of use of herbal supplements or chronic anti-inflammatory medication. Fifteen patients have enrolled to date and received the ginseng treatment from the date of enrollment until their day of surgery, ranging from 5 to 14 days. Comparisons of the above markers pre- and post-ginseng treatment were determined, with each patient serving as her own control.
Results: Four markers were assessed in the tissue samples obtained pre- and post-LEAG treatment. The percentage change for each patient was calculated. Ten of 15 patients had a decrease in TNF-alpha ($p = 0.1605$). Eleven of 15 patients had a decrease or undetectable levels of IL-8 ($p = 0.0281$). A decrease was seen in tumor expression of COX -2 in 6 of 15 patients and no change in 9 patients ($p = 0.0468$). Ki-67 was decreased in 5 patients and increased in 1 patient ($p = 0.3592$).
Conclusions: LEAG taken in a neoadjuvant trial design in 15 patients was associated with a detectable decrease both in the biomarkers of inflammation and the proliferation marker Ki-67. Results to date provide a proof of principle that supports continuation of the clinical trial. LEAG has potential as a pharmaceutical to be added to the regimen for both breast cancer prevention and treatment.

0192 Atypical Ductal Hyperplasia of the Breast: Does Size of Core Needle Biopsy Matter?
Jennifer K. Plichta, Natalia Rumas, Constantine Godellas, Claudia B. Perez
Loyola University, Maywood, IL, USA
Objectives: Atypical ductal hyperplasia (ADH) identified on core biopsy is historically associated with a 20% upgrade to malignancy at surgical excision. However, recent investigations suggest a downward trend in upgrade rates following a diagnosis of ADH on core biopsy, possibly related to the larger gauge needle used for image-guided biopsy. As such, it is critical to re-evaluate the correlation between ADH diagnosed on core biopsy and concurrent malignancy at final excision.
Method: Our pathology database was queried for the phrase "atypical ductal hyperplasia" from 2008 to 2010, and patients who underwent initial core biopsies were identified. Those who did not have subsequent surgery at our institution were excluded. Patients with concurrent or a history of breast cancer (including ductal carcinoma in situ, DCIS) were also excluded. All patients underwent initial image-guided core biopsies.
Results: There were 247 patients diagnosed with ADH between 2008 and 2010. However, only 55 were from core biopsies performed at our institution with ADH as the highest grade lesion. Of those, 43 proceeded with surgical excision. Notably, 6 of the 43 biopsy pathology reports also mentioned "suspicion" for DCIS. Following surgical excision, 10 patients were upgraded to DCIS (23.3%), including 5 of the borderline DCIS lesions. None of the patients were found to have invasive carcinoma. Excluding core biopsies identified as borderline DCIS lesions, the rate of upgrade to DCIS was 13.5% (5 of 37 patients). Interestingly, the upgrade rates significantly decreased over the years, starting at 36.4% in 2008 (4 of 11 patients), then 29.4% in 2009 (5 of 17 patients), and down to 6.7% in 2010 (1 of 15 patients). Similarly, the needle gauge used to obtain the core biopsies also changed over the years, with a 12-G needle being most common in 2008 and 2009, and a larger 9 G was most commonly used in 2010. Of the 10 core biopsies performed with 9-G needles, only 1 was upgraded to DCIS (although the biopsy pathology noted borderline DCIS), compared to 9 of the 33 core biopsies performed with smaller needles (27.3%; OR, 3.375). Logistic regression analysis revealed a 60% increase in the odds of being upgraded to malignancy for every unit increase in needle gauge. Furthermore, the 1 patient upgraded in 2010 was given a BI-RADS score of 5 (the only one of the 43 patients evaluated) and had a core biopsy performed with an 11-G needle.
Conclusions: Similar to data from other institutions, the more frequent use of larger gauge needles (i.e., 9-G needles) appears to be associated with a decreased trend in the upgrade of ADH on core biopsy to malignancy in surgical specimens. In addition, the mammographic findings (i.e., BI-RADS) remain an important prognostic indicator in determining the appropriate management of ADH on core biopsy. In conclusion, both needle size and radiologic concordance will help ascertain the likelihood of concurrent malignancy at surgical excision.

0243 Compliance and Initial Experience With Dense Breast Tissue Legislation in Texas
Roshni Rao, Henda Salmeron, Sally Goudreau, Madhu Rao, Phil Evans
University of Texas Southwestern Medical Center, Dallas, TX, USA
Objectives: Mammographic density is known to decrease the sensitivity of mammograms, placing patients at risk of presenting with large tumors, despite being compliant with recommended screening. In addition, density may be an independent risk factor for breast cancer. In Texas, patient and breast cancer advocacy groups have lobbied for legislation that requires mammogram reports and patient communication to reflect the level of density seen on a woman's mammogram, and to delineate the limited sensitivity of mammography in this setting. This legislation, termed Henda's Law, was enacted on September 1, 2011. Compliance will be required for certification from January 1, 2012. One center's plan for compliance and experience with Henda's Law is detailed.
Method: Prior to its enactment, our university-based breast center, which performs ~25,000 mammograms yearly, was aware of this impending law. A committee consisting of breast surgeons, radiologists, and administrators formulated a protocol that made the required changes in the written results given to the patients, and created patient education materials to be given to patients placed in the BI-RADS density 3 and 4 categories. Initial patient response to these changes was evaluated.
Results: Changes made to comply with Henda's Law did not adversely affect workflow or direct patient communication. There was not a noted increase in patient referrals for breast density, nor patients requesting additional imaging. There was neither a decrease in patients undergoing screening mammograms. Media coverage and interest in this law was extensive.

Conclusions: Initial experience with mammographic density legislation has been favorable. Further studies are required to evaluate the impact of this law on patient compliance with mammographic screening, anxiety levels, and its impact on physician workload. In addition, plans for monitoring and assessing compliance have yet to be determined by the legislature. Careful consideration of all the consequences of this law is warranted prior to its initiation as a national standard.

0126 The Response of Rhode Island Primary Care Providers to the 2009 United States Preventative Services Task Force Recommendations for Breast Cancer Screening

Lisa Ratanaprasatporn[1], Don Dizon[1,2], Jennifer Gao[1], Jennifer Gass[1,2], Robert Legare[1,2], Ekaterini Tsiapali[1,2]

[1]The Warren Alpert Medical School of Brown University, Providence, RI, USA, [2]The Program in Women's Oncology, Women and Infants Hospital, Providence, RI, USA

Objectives: In November 2009, the United States Preventative Services Task Force (USPSTF) released updated breast cancer screening recommendations. Among them was to recommend biennial mammography screening for women aged 50–74 years, as opposed to annual screening, and against routine mammography screening for women aged 40–49 years, advocating individualized decisions about screening in this group. This project aims to assess the awareness of the USPSTF guidelines among primary care practitioners and to what extent these guidelines have been incorporated into clinical practice.

Method: A Web-based survey of RI primary care providers in the fields of internal medicine, family medicine, and women's health was emailed to 759 providers. Providers were identified through membership in the Rhode Island Medical Women's Association, Rhode Island Academy of Family Physicians, Women and Infant's Hospital Contacts List, and Rhode Island Health Care Association. Data was analyzed using summary statistics.

Results: Between July and September 2011, 90 physicians responded (12% response rate). Nearly all providers (92%) were aware of the USPSTF breast cancer screening recommendations. However more than half (53%) have not changed referral patterns for screening mammogram. Thirty-seven percent have adopted the recommendations, but on an individualized basis. Most physicians (63%) disagreed with the recommendation of biennial screening in women aged 50-74. For women aged 40-49, nearly half (49%) agreed with the USPSTF, while 42% disagreed. Reasons cited for their decisions on clinical practice included: USPSTF criticism by other organizations, such as the American Cancer Society and National Consortium of Breast Centers (62%); fear of missing breast cancer (51%); and complete disagreement with the USPSTF (39%). Only 10% felt they did not have the appropriate time to individualize screening recommendations due to pressures of clinical practice. Forty percent of physicians believed that adopting the recommendations would lead to breast cancer detection at a later stage. Thirty-six percent believed that screening biennially would reduce false-positive results and thereby benefit patients. Thirty-eight percent also believed that the recommendations would reduce health care costs by minimizing unnecessary mammography screenings.

Conclusions: While the 2009 USPSTF recommendations have not changed the practices of the majority of RI physicians, a significant minority is adopting them on a case-by-case basis. Physicians are more accepting of individualized screening of women aged 40-49 than they are to abandoning annual screening for women aged 50-74.

0206 Technical Results and Complication Rates After Skin-Sparing and Nipple-Sparing Mastectomy and Immediate Implant-Based Reconstruction Using a Porcine Tissue Matrix Strattice® for Implant Coverage

Roland Reitsamer, Armando Farmini, Elisabeth Gschwandtner

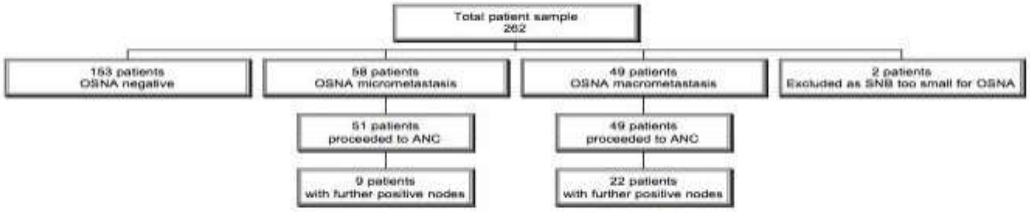
University Hospital Salzburg, Breast Center Salzburg,Salzburg, Austria

Objectives: Skin-sparing and nipple-sparing mastectomies are increasingly used for prophylactic and therapeutic purposes and replace conventional mastectomies in selected cases. There is still debate on the oncologic safety of the procedure and the technique and implementation are challenging. We report on our first 22 cases of skin-sparing or nipple-sparing mastectomy with immediate implant-based reconstruction using a porcine tissue matrix Strattice® for implant coverage.

Method: In total, 22 implant-based reconstructions using a porcine tissue matrix were performed in 18 patients (4 bilateral) after skin-sparing or nipple-sparing mastectomy. The indications for mastectomy were prophylactic in 3 patients and therapeutic in 15 patients. After skin-sparing or nipple-sparing

mastectomy, a subpectoral pocket was created and the implant was placed behind the pectoral muscle. The lower pole of the implant was covered with a porcine tissue matrix which was sutured to the lateral and inferior edge of the pectoral major muscle and to the inframammary fold creating a hammock or internal bra for the implant. Drainage was used in all patients, 1 drain behind the implant and 1 drain subcutaneously between the tissue matrix and the skin. Four skin-sparing mastectomies with resection of the nipple areola complex (NAC) and 18 nipple-sparing mastectomies were performed. The nipple was cored out in patients with nipple-sparing mastectomy. In all patients, except the prophylactic mastectomy patients, sentinel node biopsy or ALND was performed. Mean age of the patients was 48 years (min, 26; max, 71).
Results: In 81.8% (18/22) of the procedures, periareolar incision with lateral extension was performed, including those patients in whom removal of the NAC was necessary. In 18.2% (4/22) of the procedures, the incision was made in the submammary fold. Pathologic examination of the removed breast revealed multicentric invasive carcinoma in 59.1% (13/22), extensive DCIS with invasive carcinoma in 9.1% (2/22), and pure DCIS in 13.6% (3/22) and was negative in 18.2% (4/22), the prophylactic group. Radiotherapy was administered to 31.8% (7/22) of the reconstructed breasts, and 55.5% (10/18) of the patients received chemotherapy. The mean implant size was 290 ml (min, 180 ml; max, 450 ml). Complications accounted for skin breakdown with implant loss in 9.1% (2/22), secondary hemorrhage requiring revision in 4.5% (1/22), complete nipple necrosis requiring excision in 4.5% (1/22), minimal nipple necrosis with complete recovery without intervention in 18.2% (4/22), and inflammation requiring antibiotics in 4.5% (1/22). Patient satisfaction was 94.4% (17/18) and subjective cosmetic result was excellent in 89% (16/18).
Conclusions: Skin-sparing and nipple-sparing mastectomies are replacing conventional mastectomies in selected cases. Immediate implant-based reconstruction with implant coverage using a porcine tissue matrix Strattice® is an innovative approach resulting in an excellent cosmetic result. It is technically feasible and complication rates are acceptably low.

0252 Sentinel Node Biopsy Analysis Using Intraoperative One-Step Nucleic-Acid Amplification: The First Year's Experience in a General Hospital
Dionysios-Dennis Remoundos[1], Hannah Wilson[1], Farid Ahmed[1], Yoon Chia[2], Giles Cunnick[1]
[1]Department of Surgery, Buckinghamshire Healthcare NHS Trust, High Wycombe, UK, [2]Department of Pathology, Buckinghamshire Healthcare NHS Trust, High Wycombe, UK
Objectives:
To assess the ease of use of 1-step nucleic-acid amplification (OSNA) in a general hospital
To determine the incidence of OSNA-detected lymph node involvement
To differentiate between the incidence of micro- and macro- metastasis
To assess the need for axillary node clearance (ANC) in patients with OSNA-detected micrometastasis
Method: This is a single-center prospective series of consecutive patients undergoing intraoperative OSNA analysis from May 2010 to May 2011. It includes all patients with clinically and radiologically normal axillary nodes undergoing surgery for invasive breast cancer or multifocal in situ disease. Routine localization of the sentinel nodes was performed using radioactive colloid and blue dye. Sentinel node biopsies (SNB) identified were sent for intraoperative analysis. Patients positive for metastasis were subject to ANC at the same setting.
Results: Two hundred sixty-two patients underwent SNB, dissecting 415 nodes. One hundred fifty-three patients were node negative, 58 (22%) had micrometastasis, and 49 (19%) macrometastasis. Fifteen lymph nodes from 11 patients were too small for OSNA processing, but 9 of these patients had alternative suitable samples. Two patients were excluded, as all their node specimens were too small for OSNA analysis. From these, 1 patient had macrometastasis histologically. Fifty-one patients with micrometastasis proceeded to ANC during the same anesthetic. Nine (18%) had additional node disease (range, 1-6; median, 1). All 49 patients with macrometastasis underwent ANC. Twenty-two (45%) had further nodal involvement (range, 1-17; median, 2.5).



Conclusions: SNB has become standard practice for staging the axilla in breast cancer patients. Traditionally the delay acquiring SNB results requires node-positive patients to have a further operation at a later date. Detection of micrometastasis may not necessitate ANC, however may guide further adjuvant treatment. Achieving intraoperative results, using urgent frozen-section samples and imprint cytology, have made single-step procedures possible. However, these techniques are less sensitive and specific than OSNA. OSNA is a novel method for detecting lymph node involvement, requiring minimal pathologist input and a standardized automated machine operation, which is based on reverse-transcription loop mediated isothermal amplification of cytokeratin-19 m-RNA. Due to its molecular basis, it has higher detection rates of micrometastasis compared to conventional histopathology, and has therefore been gaining popularity around the world. This is one of the largest single-center series of intraoperative analysis of axillary nodes using OSNA. Our experience shows that introducing OSNA in a general hospital was a straightforward process, which, due to its automated nature, was easy to use routinely. Our detection rates of metastasis were consistent with ones found in the literature. We believe OSNA is a reliable and effective method for analyzing SNBs in breast cancer, and assessing the need for ANC. Particularly in a general hospital, it has the potential to ease the pressure on the health service by offering patients a single operation. It can therefore reduce waiting and expedite the start of adjuvant therapies. The psychological impact on patients remains to be formally investigated, but appears, in our practice, to be beneficial.

0205 Percutaneous Management of Gynecomastia: Giving Symptomatic Patients a Diagnostic and Therapeutic Option

Heather Richardson
Piedmont Hospital, Atlanta, GA, USA

Objectives: Gynecomastia is a common condition in men. Conservative management and reassurance is the mainstay of most cases, however, some patients significantly affected by gynecomastia request additional intervention. Surgical removal of the glandular tissue is often considered cosmetic and is a significant investment when considering time, cost, and effort. Large-gauge biopsy devices have been used successfully to address benign-appearing lesions in women, reducing the bulk of an appreciated lesion, which can be both therapeutic as well as diagnostic. The purpose of this retrospective chart review (Piedmont Hospital IRB CR P11-40) is to assess the utility of ultrasound-guided percutaneous biopsy to provide tissue for diagnostic purposes, while also providing the additional benefit of debulking areas of symptomatic gynecomastia.

Method: A retrospective chart review was performed on patients with gynecomastia who underwent ultrasound-guided biopsy between 3/2005 and 9/2011. Large-gauge (7 g and 8 g) core needle vacuum-assisted devices were used with an aim to remove glandular parenchyma that was visible on ultrasound and grossly palpable. To prevent hematoma formation, Lidocaine with epinephrine was utilized for anesthesia and a 7-lb compression sandbag was utilized for 45 min following the procedure to ensure hemostasis.

Results: Seventeen male patients between the ages of 20 and 61 underwent a total of 23 percutaneous ultrasound-guided biopsies in an in office setting by a single practitioner. Final pathology showed 11 patients with simple gynecomastia, 5 patients with pseudoangiomatous stromal hyperplasia (PASH), and 2 with stromal fibrosis. No malignancy or atypia was appreciated. Three patients had hematomas, none requiring operative evacuation or intervention. Following instigation of postbiopsy compression protocol, no further hematomata were seen. All patients had reduction and improvement of their gynecomastia

volume and symptoms, however 2 of the patients who were found to have PASH in their specimen had reaccumulation and returned for additional debulking at 12 and 23 months.
Conclusions: Patients with gynecomastia who are not comfortable with simple conservative management can be offered percutaneous debulking of the affected area rather than operative removal. This provides tissue for diagnostic purposes while reducing the volume of the area affected which has improved the appearance and symptoms. Patients with PASH on final biopsy should be counseled that it may recur and that additional tissue removal can be considered if it does recur. Prevention of hematoma formation with postprocedure compression should be considered for those who intend to have larger volumes of tissue addressed.

0262 Defining the Role of Areolar-Sparing Mastectomy: 207 Procedures Over a 6-Year Period
Heather Richardson[1], Diana Woodall[2]
[1]Piedmont Hospital, Atlanta, GA, USA, [2]Emory University, Atlanta, GA, USA
Objectives: Skin-sparing mastectomy is considered a safe and reasonable option for patients facing mastectomy surgery. As current trends move toward the preservation of more native tissue, the utility of preserving the areola as an entity separate from the nipple and ductal tissue therein is an option often overlooked. A retrospective chart review was performed to assess the pattern of use and the safety of this technique in a private practice setting.
Method: A total of 232 charts of patients who underwent mastectomy by a single practitioner for treatment of disease and for prophylaxis were reviewed. Type of surgery, type of reconstruction, loco-regional recurrence, and distant recurrence rates were recorded.
Results: From January 2006 to July 2011, a total of 395 mastectomies were performed in 222 patients. Patient ages ranged from 28 to 94 years, (mean, 44.5; median, 55). Follow-up ranged from 66 months to 4 months. Of those, 118 were able to undergo areolar-sparing technique-- 75.4% chose a bilateral procedure and the remaining chose unilateral, totaling 207 areolar- sparing mastectomies. Of those who did not undergo areolar-sparing technique, 62 underwent standard skin-sparing technique, and 52 underwent simple mastectomy without reconstruction. Locoregional recurrence was noted in 7 patients: 7.6% of simple mastectomy patients (n = 4), 3.2% of standard skin-sparing patients (n = 2), and 0.8% of patients undergoing areolar-sparing technique (n = 1). No recurrences have been noted in the retained areolar skin.
Conclusions: Women have a variety of options with regard to what is and is not preserved for reconstruction after mastectomy. Patients and physicians who do not wish to utilize nipple- sparing technique yet want to retain a more natural appearance in a reconstructed breast can safely consider preservation of the areola.

0006 Cost-Effectiveness of Contralateral Prophylactic Mastectomy for Prevention of Contralateral Breast Cancer
Amanda Roberts[1,3], Mehran Habibi[2], Kevin Frick[3]
[1]University of Toronto, Toronto, ON, Canada, [2]Johns Hopkins University School of Medicine, Baltimore, MD, USA, [3]Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA
Objectives: To examine the cost-effectiveness of contralateral prophylactic mastectomy for the prevention of contralateral breast tumors in women less than 50 years of age with early-stage, non-high-risk unilateral breast cancers.
Method: A decision tree using TreeAge Pro 2011 software was used to model the costs and effects of contralateral prophylactic mastectomy with ipsilateral therapeutic mastectomy vs ipsilateral therapeutic mastectomy alone in women less than 50 years of age with early, non-high-risk, estrogen-receptor-negative breast cancers. Cost estimates were obtained from the Medicare Fee Schedule and the Healthcare Utilization Project. Probability estimates were obtained from the literature. Outcome effects were measured by incremental cost per quality-adjusted life year (QALY) gained. A 10-year risk period for contralateral breast cancer, a lifetime horizon, and a societal perspective were used.
Results: Contralateral prophylactic mastectomy is dominated by ipsilateral therapeutic mastectomy alone in terms of incremental cost per QALY gained over a lifetime horizon. The incremental cost per QALY gained is sensitive to the cost and frequency of radiologic follow-up. Contralateral prophylactic mastectomy would be cost-effective for contralateral breast cancer prevention if the cost of radiologic follow-up exam for the contralateral breast were greater than $630 per year for women currently undergoing ipsilateral therapeutic mastectomy alone.

Conclusions: Contralateral prophylactic mastectomy is not cost-effective for the prevention of contralateral breast cancer in women less than 50 years of age with early-stage, non-high-risk unilateral breast cancers.

0176 Systemic Low-Density Lipoprotein Promotes Breast Cancer Progression

Catarina Rodrigues Santos[1,2], Jose Mendes Almeida[1], Sérgio Dias[1,2]
[1]Portuguese Institute of Oncology, Lisbon, Lisbon, Portugal, [2]CIPM, IPOLFG, Lisbon, Portugal

Objectives: Obesity is a breast cancer (BC) risk factor. Despite major modifications of lipid metabolism during obesity, little is known about the role of plasma cholesterol in BC. The objective of this work is to study the influence of systemic cholesterol in BC progression.

Method: Ninety-three women with BC diagnosis without previous treatment or familiar history of BC and not taking lipid-lowering or anti-diabetic drugs were included. Total cholesterol (TC), low-density cholesterol (LDL), high-density cholesterol (HDL), and triglycerides (TAG) at diagnosis were determined. Multivariate linear analysis was used to determine correlation between lipid profile and tumor characteristics (size, differentiation grade, hormonal receptor (HR), HER2, lymph node metastasis, and pathological stage). To validate some clinical data, in vitro experiments using MDAMB231 cells were performed. Briefly, cells were cultured in Dulbecco's Modified Eagle Medium +1% lipoprotein-free fetal bovine serum + LDL 0 ug/ml or 100 ug/ml, 24 h. Proliferation rates were obtained by duplicate cell counts in a hemacytometer after trypan blue exclusion test. Wound-healing assays were done in cell monolyers and cell migration was registered at 0, 12, and 24 h. Epithelial mesenchymal transition (EMT) was assessed by immunofluoresce.

Results: Clinical data showed that top LDL quartis patients, compared to bottom LDL quartis patients, have larger tumors, less differentiated (cLDLQ1 G3: 0,4%; cLDLQ2-4 G3: 25,7%), with more lymphovascular invasion (LVI) and regional lymph node metastasis. No differences in menopausal status, parity, HR, TC, HDL, or TAG were found (Table 1). In vitro exposure of MDAMB231 to LDL induces cell proliferation (2,6-fold) and migration in wound-healing assay (wound-healing closure at 24 h: control, 25%; LDL condition,100%; p, 0,007). By immunofluorescence, we showed that cells lost epithelial markers (E-cadherin) in the presence of LDL, recapitulating the EMT process.

Table 1. Univariate Logistic Regression Results for cLDL Quartis Groups

			Odds Ratio (95% CI)	***P* value***
Variable	**cLDL Q1** (cLDL ≤ 107, 5 mg/dl) n = 23	**cLDL Q2-4** (cLDL >107, 5 mg/dl) n = 70		
Tumor stage (T2/T3)	43,5%	62,3%	0,465 (0,179-1,212)	0,146
RE positive	81,8%	82,1%	0,982 (0,281-3,429)	1,0
RP positive	72,2%	64,4%	1,4 (0,438-4,510)	0,775
Her2-neu positive	18,2%	21,2%	0,825 (0,240-2,834)	1,0
LVI positive	5,6%	33,3%	0,118 (0,015.0,952)	0,030
Clinical stage (II/III)	52,2%	73,9%	0,385 (0,14-1,025)	0,070
Tumor size (mm)	16 ± 7	24 ± 14		0,007[1]
Ratio (LN positive/ LN removed)	0,008 ± 0,19	0,20 ± 0,33		0,134[1]

*X^2 test. [1]Mann-Whitney test: median ± SD.
RE, estrogen receptor; RP, progesterone receptor; LN, lymph node.

Conclusions: Results strongly suggest that systemic LDL promotes breast cancer progression. We are now exploring the molecular mechanism under this effect and whether it is direct or indirect.

0242 Passive Microwave Thermography (OncoScan) As an Adjunct to Standard Breast Imaging

Jesssica Ryan[2], Roger Graham[1], Jeff Carr[1], Kenneth Carr[1]
[1]Tufts Medical Center, Boston, MA, USA, [2]St Elizabeth's Medical Center, Boston, MA, USA

Objectives: Many women undergo unnecessary breast biopsies based on a suspicious clinical finding. We wanted to establish the utility of passive microwave thermography as an adjunct to standard breast imaging in women scheduled for definitive biopsy.

Method: Two hundred eighty-five patients were scheduled for breast biopsy based on an abnormal physical exam, mammogram, and/or ultrasound. Each patient was preoperatively screened with OncoScan – a noninvasive test of thermal activity in the breast that measures microwave emissions of breast tissue by passive microwave radiometry. Twenty temperature recordings were obtained from each of 10 locations in the target breast and in the corresponding locations in the contralateral breast. An additional 5 temperature recordings were then obtained in the area of the suspicious finding. A detection algorithm was used to incorporate increments of temperature readings into a total score. A significant score then designated a patient as having increased thermal activity (OncoScan positive).

Results: Eighty-two patients had breast cancer: IDC, 44; ILC, 4; DCIS, 30; LCIS, 4. The remaining 203 patients had benign disease, although 39 of these patients had either atypical ductal hyperplasia (ADH) or atypical lobular hyperplasia (ALH). The OncoScan detected increased thermal activity in 134 patients, while 151 patients were considered OncoScan negative (Table 1).

	OncoScan+	OncoScan-
Benign	56	108
ADH/ALH	17	22
LCIS	2	2
DCIS	20	9
ILC	1	3
IDC	37	8

Of the 82 patients with breast cancer, 60 were OncoScan-positive. Of the 203 patients with benign disease, the OncoScan was negative in 133 (Table 2).

	Cancer	Cancer + ADH/ALH
Sensitivity	73%	63%
Specificity	64%	66%
PPV	45%	58%
NPV	85%	71%

Conclusions: The positive predictive value (PPV) for OncoScan detection of breast cancer was 45%, comparing favorably with both mammogram and ultrasound. If one includes the common precursors of breast cancer – LCIS, ALH, and ADH – the PPV was 58%. This appears to be a promising technology as an adjunct to our current imaging modalities for breast cancer.

0255 Trends in Gynecomastia and Male Breast Excision

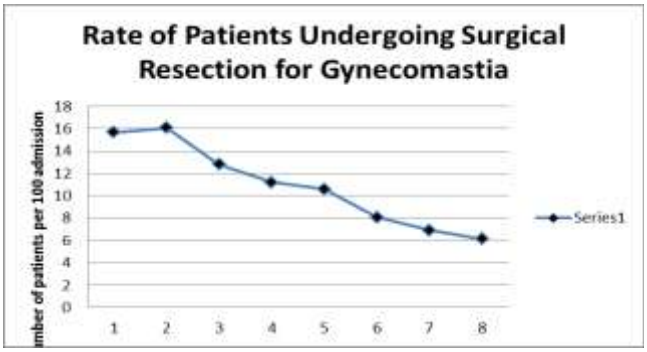
Jessica Ryan
Steward St Elizabeth Medical Center, Boston, MA, USA

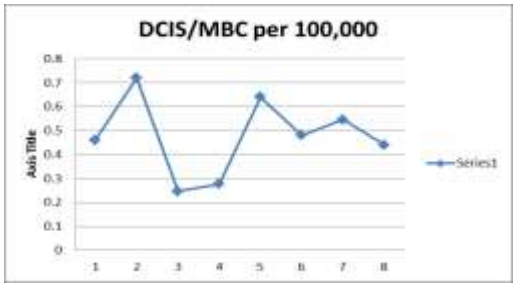
Objectives: Most men presenting with gynecomastia carry a cosmetic, rather than oncologic, concern. This often dictates to which specialty of surgery a patient is initially referred. The benign condition of gynecomastia is standardly diagnosed simply by physical exam. How may patients perceive their risk of cancer and might this affect their decision to pursue surgery? This study set out to question the general trend seen in gynecomastia excisions and to assist in properly counseling our patients

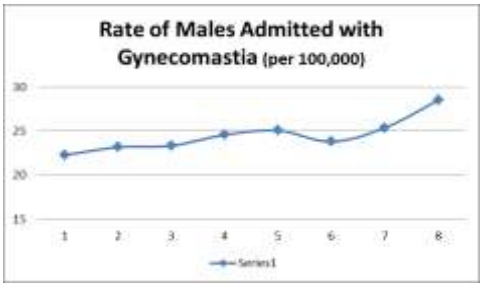
Method: A query of the National Inpatient Sample (NIS) database was performed. Various criteria regarding all male patient admissions were extracted from the years 2001 through 2008. We searched for a diagnosis of gynecomastia, both alone and concurrently with malignant breast disease. ICD-9 coding was used to ascertain whether a surgical excision was performed.

Results: The number of admissions that included a diagnosis of gynecomastia, while initially stable, has shown a significant rising trend from 2006-2008. The number of males admitted with premalignant or malignant breast disease has remained relatively stable. No concurrent diagnoses were identified. We did observe a significant decline in patients undergoing an excisional procedure ranging from bilateral

subcutaneous mammectomy to simple mastectomy. The mean age of those undergoing excision ranged from 56 to 67 years of age.







Conclusions: There has been a continual decline in the number of patients pursuing elective excision for gynecomastia. A possible explanation could involve patients being reassured when physical findings are deemed consistent with the benign condition of gynecomastia. Albeit rare, a male breast cancer must not be overlooked, particularly in the presence of significant risk factors.

0050 Utility of Preoperative Breast MRI for Evaluation of DCIS

Hank Schmidt[1], Angela Keleher[1], Heather Viola[1], Greg Zanieski[1], Sara Winterleitner[1], Russel Karp[2,3]
[1]Department of Surgery, Vassar Brothers Medical Center, Poughkeepsie, NY, USA, [2]Department of Radiology, Vassar Brothers Medical Center, Poughkeepsie, NY, USA, [3]DRA Imaging, Poughkeepsie, NY, USA

Objectives: The value of preoperative breast MRI prior to definitive surgery for ductal carcinoma in situ (DCIS) remains controversial. While it often allows detection of additional disease, there is no clear evidence of improved outcomes. In order to determine utility of MRI in the surgical decision-making process after initial diagnosis of DCIS, we reviewed a single- institution experience.

Method: Patients were identified from a tumor registry cross-referenced with a prospectively maintained radiology database. Date of diagnosis spanned a 3-year period when all new cases of DCIS were referred for breast MRI. Inclusion criteria included initial diagnosis of pure DCIS by core needle or excisional biopsy with preoperative MRI, mammogram, and available final surgical pathology. All preoperative imaging studies were independently reviewed for this protocol. Data was collected regarding imaging characteristics with each modality, contrast enhancement kinetics on MRI, pathology, concordance between modalities, and impact on surgery.

Results: Seventy-two cases of DCIS were identified in the study period and 55 cases met all inclusion criteria. MRI findings impacted surgical decision making in 27% of cases. The most frequent change in management induced by MRI was a larger partial mastectomy (8 cases). MRI findings led to contralateral surgery in 3 cases: 2 excisional biopsies for lesions not amenable to core needle sampling and 1 partial mastectomy after contralateral invasive disease was diagnosed on MRI-guided core needle biopsy. Positive margins were observed in 13% of cases. In the subset of patients where MRI findings led to a larger partial mastectomy, positive margins were encountered in 40% of cases, MRI-induced conversion from a breast- conserving approach to mastectomy in 7%. In only 1 of these cases was multicentric disease not confirmed by core needle biopsy preoperatively.

Conclusions: Preoperative MRI in the setting of DCIS impacts surgical planning and allows diagnosis of additional disease. Patients with more extensive focal disease indicated by MRI demonstrated a higher rate of positive margins at the time of partial mastectomy.

0170 Two Surgeons, One Patient: The Impact of Surgeon-Surgeon Familiarity on Patient Outcomes Following Mastectomy With Immediate Reconstruction

Akhil Seth, Elliot Hirsch, Neil Fine
Division of Plastic Surgery, Feinberg School of Medicine, Northwestern University, Chicago, IL, USA

Objectives: Mastectomy with immediate breast reconstruction traditionally requires the coordination and expertise of 2 distinct surgeons. At large institutions, this often results in several different combinations of mastectomy and reconstructive surgeons that have varying levels of experience with each other. However, the impact of this varied team model on patient outcomes has not been established. This study evaluates the effect of different surgical teams on complication rates following mastectomy and immediate reconstruction.

Method: Retrospective review of 897 consecutive patients (1202 breasts) who underwent mastectomy with immediate implant reconstruction from 4/1998-10/2008 yielded 15 mastectomy surgeons and 6 reconstructive surgeons who performed the surgeries at 1 institution. Patients of the 4 highest-volume mastectomy and reconstructive surgeons were chosen (n = 862 breasts) and then stratified based on the combination of surgeons that performed the operation, resulting in 16 different groups or surgical teams. Complications were categorized by end-outcome, including nonoperative (no additional surgery), operative (additional surgery except explantation), or explantation. Statistics were performed using Fisher exact test, Student *t* test, and analysis of variance (ANOVA) with Bonferroni correction.

Results: Each mastectomy surgeon worked with each reconstructive surgeon a different number of times (n =15-198 breasts per group). Preoperative and postoperative characteristics were similar among patients with the same mastectomy surgeon but different reconstructive surgeon, including age, body mass index, smoking status, and radiation exposure. Mean follow-up was 32.9 months. For each mastectomy surgeon, the number of procedures performed with each reconstructive surgeon did not significantly affect complication rates. Of the 16 surgical teams, 4 teams performed the majority of procedures (n = 468 breasts). However, the combined complication rates of these higher volume teams were similar to those of the remaining 12 lower volume teams (n = 394 breasts) (overall complications, 18.2% vs 17.0%; nonoperative, 10.3% vs 9.6%; operative, 12.8% vs. 11.2%; explantation, 8.6% vs 7.6%, respectively).

Conclusions: Our study suggests that among high-volume surgeons at a single institution, complication rates following mastectomy with immediate reconstruction are not affected by the surgeons' familiarity with each other. Despite operating on the same patient, the individual surgeons' expertise may have a greater impact on outcomes than the team's experience with each other, particularly given the temporal separation between mastectomy and reconstruction. These results validate the efficacy and safety of the surgeon distribution model currently utilized by many breast surgery practices.

0169 The Association Among "Triple-Negative" Breast Cancers, Lymph Node Metastasis, Disease-Free, and Overall Survival

Rupen Shah, Kelly Rosso, S. David Nathanson, Meredith Mahan, Dhananjay Chitale
Henry Ford Health System, Detroit, MI, USA

Objectives: The absence of estrogen, progesterone, and Her-2/neu receptor expression in triple-negative breast cancer (TNBC) provides no specific target for systemic therapy for this highly aggressive tumor. We hypothesized that patients with TNBC have an increased incidence of sentinel lymph node (SLN) metastases and, because of the lack of targeted systemic therapy, decreased disease-free and overall survival when compared to receptor positive breast cancer (RPBC).

Method: Our sentinel lymph node prospectively accrued and retrospectively analyzed database consisted of 1,971 patients followed for 1 to 16.4 years. Of these patients, 230 (11.7%) were triple-negative. A total of 1,829 patients underwent SLN dissection and the remainder complete axillary lymph node dissection if the SLN was not identified. Patients were analyzed based on the presence or absence of TNBC. Any tumors expressing ER, PR, and/or Her-2 were considered RPBC. Multiple variables were analyzed and those with statistical significance by univariate analysis were further analyzed by multivariate analysis. Disease-specific and overall survivals were determined using the Kaplan-Meier method. Statistical analysis was performed using SAS 9.2.

Results: Median and mean follow-up times for all patients were 54 and 59.7 months, respectively. There was no significant difference in the rate of SLN metastases between TNBC and RPBC ($p = 0.564$). TNBC demonstrated a higher incidence of LVI ($p = 0.016$), larger tumor size ($p < 0.001$), and higher grade ($p < 0.001$) in the univariate analysis, but only age and tumor grade were significantly different in the multivariable model ($p = 0.009$ and $p < 0.001$, respectively). Triple-negative status was found to increase the odds of distant metastases by 2.15-fold; however, this failed to gain statistical significance ($p = 0.063$). Overall survival in patients with TNBC trended toward being worse ($p = 0.079$), with a 2.71-fold increased risk of cancer death compared to RPBC; when analyzed separately, survival of these patients was lower in the first 8 years of diagnosis but was comparable thereafter.
Conclusions: Patients with TNBC were found to have no difference in lymphovascular invasion, tumor size, and rates of distant and lymph node metastases but demonstrated an increased mortality in the first 8 years after treatment when compared to patients with RPBC.

0073 Title: Dispelling the Myths Behind Lymphedema Triggers After Treatment for Breast Cancer: Is It Possible?

Shayna Showalter, Carla Fisher, Justin Brown, Kathryn Schmitz
University of Pennsylvania, Philadelphia, PA, USA

Objectives: Breast cancer-related lymphedema (BCRL) is a feared complication for breast cancer survivors who have had any type of axillary surgery. BCRL can alter function and quality of life. Survivors with BCRL use twice as many medical resources as survivors without BCRL and 10% of survivors with BCRL are on permanent disability. Data are sparse in regard to common exposures that may induce a BCRL flare. The goal of this study was to evaluate the relationship between potential exposures and the incidence of BCRL flare in women who have undergone surgery for breast cancer.
Method: We performed a prospective substudy from a randomized control exercise trial of 295 breast cancer survivors who were at risk for developing lymphedema or who had stable lymphedema. Participants were asked to report their exposure to 30 different potential lymphedema risk factors in 3-month intervals for 1 year. The list of risk factors was compiled by a clinician who is an expert on lymphedema. At each 3-month interval, participants completed water volume displacement measures to assess arm volume. A lymphedema flare was defined as a ≥5% increase in interlimb water volume difference between 2 consecutive time points. Nonparametric methods were used to compare baseline characteristics of women who did and did not experience a BCRL flare. Mixed models were used for the longitudinal analysis of lymphedema flare over the 3 time points.
Results: A total of 295 breast cancer survivors (n = 141 with stable lymphedema and n = 154 at risk for lymphedema) were randomized to weightlifting or standard care between 2005 and 2007. During this time, 27 (9%) participants experienced a BCRL flare and 268 (91%) did not. Participants who experienced a flare were similar to participants who did not experience a flare, with the exception to race ($p = 0.04$), number of nodes removed ($p = 0.05$), and treatment with radiation ($p = 0.005$). Sauna use was the only exposure that was predictive of a BCRL flare (OR = 5.77, CI = 1.00-33.82, $p = 0.05$). In addition there was a significant, additive interaction when participants reported both sauna use and having a cut on the affected arm (OR = 18.74, CI = 1.41-249.48, $p = 0.027$). Although only a small portion of the cohort (5%), non-Caucasian and non-African American participants had an increased risk for experiencing a lymphedema flare (OR = 5.74, CI = 1.71-19.31, $p = 0.005$). A number of the exposures hypothesized as risk factors for BCRL flares were not associated with an increased risk of a flare in our study (Table 1).

Table 1. Lymphedema Risk-Factor Exposures Over 12 Months, All Participants—no. (%)

Exposure	3-month (n=271)	6-month (n=266)	12-month (n=253)	OR (95% CI)	P-Value
Fever	24 (9%)	27 (10%)	24 (10%)	1.22 (0.36–4.22)	0.74
Vigorous exercise in hot weather	20 (7%)	19 (7%)	15 (6%)	1.00 (0.11–4.17)	0.99
Travel to hot/humid place	51 (19%)	49 (19%)	38 (15%)	1.09 (0.40–2.96)	0.87
Sunburn	20 (7%)	22 (8%)	14 (6%)	1.76 (0.49–6.26)	0.38
Pet scratch	32 (12%)	36 (14%)	39 (16%)	1.49 (0.54–4.11)	0.44
Bug Bite	101 (37%)	93 (35%)	86 (34%)	1.09 (0.49–2.45)	0.81
Cut	111 (41%)	96 (36%)	106 (42%)	1.99 (0.91–4.35)	0.08
Hang nail	90 (34%)	90 (34%)	90 (36%)	0.66 (0.27–1.57)	0.34
Manicure	86 (32%)	88 (33%)	74 (29%)	1.33 (0.59–3.01)	0.49
Blister	27 (10%)	24 (9%)	27 (11%)	0.77 (0.18–3.36)	0.73
Hot tub use	27 (10%)	25 (9%)	23 (9%)	0.76 (0.17–3.31)	0.71
Travel by airplane	81 (30%)	81 (30%)	84 (33%)	0.62 (0.24–1.57)	0.31
Acupuncture	0 (0%)	1 (1%)	2 (1%)	5.16 (0.11–47.98)	0.11
Bruise	30 (11%)	32 (12%)	28 (11%)	1.98 (0.69–5.67)	0.20
Change of breast prosthesis	4 (1%)	6 (2%)	4 (2%)	2.10 (0.26–17.00)	0.49
Blood draw	8 (3%)	7 (3%)	9 (4%)	1.13 (0.15–8.74)	0.91
Bra too tight	37 (14%)	35 (13%)	24 (10%)	1.26 (0.42–3.76)	0.67
Blood pressure cuff	6 (2%)	3 (1%)	10 (4%)	1.47 (0.18–11.77)	0.72
Constriction	11 (4%)	13 (5%)	13 (5%)	0.78 (0.10–5.97)	0.81
Lying on affected arm	204 (75%)	201 (76%)	194 (78%)	0.52 (0.23–1.17)	0.11
Surgery	17 (6%)	11 (4%)	14 (6%)	1.42 (0.32–6.31)	0.65
Travel to different altitude	28 (10%)	24 (9%)	30 (12%)	0.51 (0.05–2.06)	0.35
Heavy lifting	90 (33%)	92 (35%)	80 (32%)	0.56 (0.22–1.41)	0.22
Overuse from chores	63 (23%)	78 (29%)	70 (28%)	0.47 (0.16–1.38)	0.17
Menstrual changes	9 (3%)	15 (6%)	12 (5%)	1.68 (0.37–7.49)	0.50
Sauna use	**4 (1%)**	**4 (2%)**	**5 (2%)**	**5.77 (1.00–33.82)**	**0.05**
Infection	9 (3%)	3 (1%)	11 (4%)	1.35 (0.17–10.60)	0.78
Sports injury	5 (2%)	6 (2%)	2 (1%)	1.82 (0.35–15.12)	0.56
Skin burn	11 (4%)	10 (4%)	5 (2%)	2.52 (0.53–11.93)	0.24
More alcohol intake than usual	11 (4%)	13 (5%)	7 (3%)	1.37 (0.15–5.79)	0.67
Median # of exposures [IQR]	4 [2–6]	4 [2–6]	4 [1–6]	0.98 (0.85–1.12)	0.73
Range	0–18	0–15	0–17	—	—

Conclusions: In our patient cohort, many common exposures that have been reported to be risk factors did not prove to have a significant predictive relationship for BCRL flares. Sauna use was a significant risk exposure for BCRL flare. Physicians should advise women with or at risk for developing BCRL to avoid sauna use. We also found that demographic factors, such as race, may be associated with an increased risk for developing a flare. This study provides a novel analysis of exposures commonly believed to be risk factors for BCRL flares. The results can be used to promote patient and physician awareness.

0198 Changes in Treatment Recommendations Based on the 21-Gene Recurrence Score Even in Node-Positive Patients

J Stanley Smith, Rena Kass, Gordon Kauffman
Penn State Hershey Medical Center, Hershey, PA, USA

Objectives:

1. Review a single institution's large experience with the recurrence score (RS).
2. Compare treatment recommendations with the 2004 NCCN guidelines for ER+ node- negative patients.
3. Review recent treatment recommendations based on RS for 1-3 node positive patients.
4. Review follow-up data.

Method: A prospective data collection of all RS tests submitted to Genomic Health, including 350 patients with evaluable scores. Data analysis based on age, size, tumor type, tumor grade, mitotic index, nodal status, ER, PR, and Her-2. Follow-up for recurrence was evaluated by chart review through our breast cancer survivor clinic.

Results: Three hundred fifty RS were collected since 2005. Mean follow-up of 2.5 years. Fifty-four percent of RS were low risk (0-17), 38% intermediate (18-30), and 8% high (≥31). Two hundred ninety-three scores were for ER+ node-negative cancers. Fifty-one percent had a change of treatment recommendation from chemotherapy to endocrine therapy based on RS. Five percent switched from endocrine to chemotherapy. There were 57 RS for 1-3 node positive cancers. Twenty-six (46%) were micrometastases. Node-positive scores were 59% low risk, 37% intermediate, and 3% high risk, similar to the node-negative set. Node-positive scores greater than 25 were recommended for chemotherapy (17/57). For patients with >5-yr follow-up, there is 1 metastatic breast cancer, 1 cardiac arrest, 3 nonrelated cancers.

Conclusions: The RS is a valuable prognostic and predictive tool in recommending adjuvant treatment for ER+ breast cancer. The biologic behavior of breast cancer genomic scoring is similar for node-negative and 1-3 node-positive patients. The RS has markedly changed the treatment recommendations in our center. Treatment recommendations based on the recurrence score are safe in short-term follow-up.

0090 Core Needle vs Surgical Excision Breast Biopsy in a Community-Based Health System

Laurel Soot[1,2], Roshanthi Weerasinghe[1], Lian Wang[1], Heidi Nelson[1,2]
[1]Providence Cancer Center, Portland, OR, USA, [2]Oregon Health & Sciences University, Portland, OR, USA

Objectives: Although recently published articles report excisional breast biopsy rates as high as 30% in community-based practices, these rates likely misrepresent practice in many health systems. This study evaluates rates of core needle and excisional breast biopsies in a large community-based health system, indications for excisional biopsy, and the relationships between type of biopsy, age, and pathologic diagnosis.

Method: A retrospective review of 4,114 initial breast biopsies obtained during 2008-2010 in 6 community hospitals within Providence Health & Services—Oregon was conducted using the health system breast health registry. Biopsy rates were determined. Patient age and pathology diagnosis were compared between the 2 types of biopsies using *t* tests and ordinal logistic regression controlling for age. The indication for excisional biopsy was determined from chart review. The relationship between indication and patient age was examined by 1-way ANOVA. Age was reported as mean ± SE. Statistical analysis was performed using R 2.11.1 software (R Foundation for Statistical Computing, Vienna, Austria).

Results: Excisional breast biopsy as the initial diagnostic procedure was performed in 551 or 13.4% (95% CI, 12.4%-14.4%) of patients. Mean age of patients with excisional biopsies was approximately 8 years less than patients with core needle biopsies (47.4 ± 0.7 vs 55.5 ± 0.2 years, $p < 0.001$). For women with core needle biopsies, 24% had invasive breast cancer and 61% a benign diagnosis; for women with excisional biopsies, 7% had an invasive diagnosis and 83% a benign diagnosis ($p < 0.001$, age-adjusted). For excisional biopsy cases, 327 (59%) presented with symptomatic lesions, 134 (24%) were not technically amenable to core needle biopsy, and 60 (11%) were based on patients' decisions; in 30 (5%) cases the indication was not documented. Of the 41 invasive breast carcinomas diagnosed by excisional biopsy, 13 (32%) were not technically amenable to core needle biopsy. There was a significant difference in the mean age of patients by indication for excisional biopsy ($p = 0.002$); women who presented with symptomatic lesions were younger, while women with lesions not amenable to core biopsy were older (43.9 ± 0.9 vs 54.3 ± 1.2 years, $p < 0.001$).

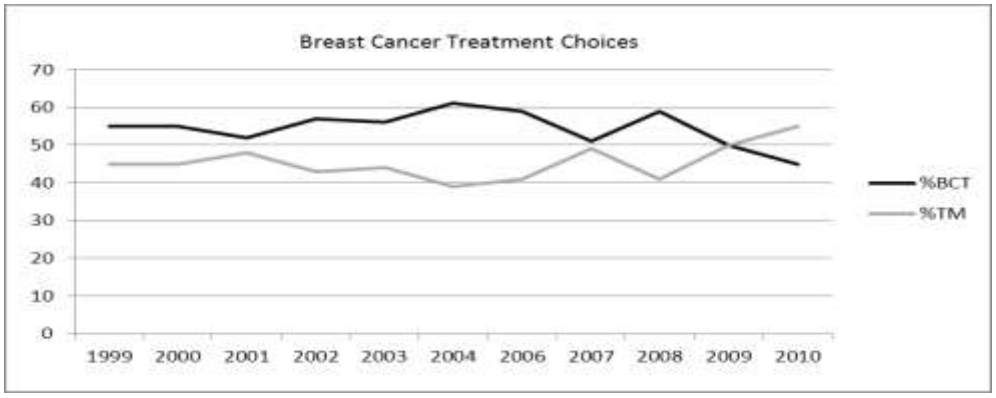
Table 1. Pathologic Diagnosis by Biopsy Method*

Diagnosis	Core Needle Biopsy	Excisional Biopsy
Invasive	867 (24%)	41 (7%)
DCIS	249 (7%)	22 (4%)
LCIS	45 (1%)	7 (1%)
Atypia	245 (7%)	22 (4%)
Benign/other	2157 (61%)	459 (83%)
Total	3563	551

* Age-adjusted comparison (ordinal logistic regression) indicates significant differences in pathology yield between the 2 biopsy methods, $p < 0.001$.

Conclusions: The 13.4% excisional breast biopsy rate at our community-based health system is much lower than rates reported from other community-based practices. Current media attention on the overutilization of excisional breast biopsy may be unwarranted. Legitimate indications—such as symptomatic presentations, lesions not amenable to core needle biopsy, and patient choice—need to be considered when determining acceptable use of excisional biopsy.

0015 Trends In Breast Cancer Treatment Choices—Breast-Conserving Surgery vs Mastectomy
Angela Soto Hamlin
Oakwood Cancer Center, Mechanicsburg, PA, USA
Objectives: To look at the trend in breast cancer treatment choices and to look for patterns in the choices that are made.
Method: One surgeon's data is used to track the trend in rates of mastectomy (TM) vs breast- conserving surgery (BCT) over 10 years using billing and procedure code records, a total of 2545 patients. Charts for all patients diagnosed and treated in 2010 were reviewed—176 patients**.**
Results: BCT rates initially rose from 55% in 1999 to a high of 61% in 2004. Since then, the trend has reversed with the curves meeting at 50% in 2009 and then crossing in 2010 with a BCT rate of 45%.



In 2010, 176 women underwent breast surgery for 178 cancers (6 bilateral cancers and 4 BRCA patients without a new diagnosis of cancer). Of those women choosing TM, there was a trend to higher stage (stage 0/1, 60% TM vs 85% BCT), younger age (59.8 TM vs 63.7 BCT), and greater family history (first-degree and/or multiple relatives, 75% TM vs 61% BCT). Half of those treated with TM had a need to do so—multicentric, local recurrence after previous BCT, IBC, etc. Another 10% had survival advantage to TM—BRCA+ and age <38. Four percent had an increased risk of a second cancer—LCIS. Five percent had extensive benign disease and a lack of confidence of early detection. Nine percent had strong family history or large cancer for size of breast and a perception of increased risk for second cancer or recurrence. Fifteen percent were in women with bilateral cancers or metachronous cancers with previous TM. Six percent were purely patient preference.
Conclusion: This analysis suggests that risk—actual or perceived—is the key factor in decision making for this cohort of women. Part of the trend toward more TM is due to better detection of multicentric tumors. Perhaps we will see a lower local recurrence rate after BCT. A better understanding of genetic risks has also influenced recent trends. Even among women who have a choice, risk of local recurrence and risk of a second cancer played a role in decision making. Patients are greatly influenced by their physicians. This places enormous responsibility on surgeons to counsel patients appropriately. In spite of the risk of surgeon bias influencing patients' decisions, quality should not be measured solely on rates of BCT vs TM. Women deserve to be afforded choice in a nonjudgmental environment.

0042 The Risk of Dying After Breast Cancer Surgery
Bonnie Sun[2,1], Vaishali T. Kent[2,1], Melvin J. Silverstein[2,1]
[1]Breast Program, Hoag Memorial Hospital Presbyterian, Newport Beach, CA, USA, [2]Division of Surgical Oncology, Keck School of Medicine, University of Southern California, Los Angeles, CA, USA
Objectives: Breast cancer is the most common cancer in women and the second leading cause of cancer-related death in the US. The vast majority of patients with breast cancer are operable at diagnosis. Breast cancer resection is generally considered to be a low-risk procedure that carries a low perioperative mortality rate. We report our series of patients who underwent breast cancer resection to determine the perioperative mortality rate.
Method: We reviewed a 30-year prospective breast cancer database and selected patients with breast cancer who underwent curative resection. All-cause mortality; breast cancer-specific mortality; 30-day,

60-day, 90-day, and 1-year mortality were calculated. Various factors attributable to mortality were examined, such as age, cancer stage at diagnosis, presence of distant metastasis, and year of diagnosis. **Results:** Four thousand nine hundred fifty-six breast cancer patients underwent resection with curative intent. Average age was 54 years at diagnosis. There were 767 non-breast cancer related deaths and 454 breast cancer-specific deaths with 7.35 years of average follow-up. There were 21 deaths within 1 year of surgery: 2 deaths within 30 days, 2 deaths from 31-60 days, 5 deaths from 61- 90 days, and 11 deaths from 61-120 days. The 2 deaths that occurred within 30 days were attributed to necrotizing clostridial infection and bleeding in patients with stage I and IIB breast cancer, respectively. The additional 19 deaths from 31 days to 90 days were attributed to metastatic breast cancer. All 21 deaths within 90 days occurred in patients over age 68 years, with the mean age at 72 years. The 90-day mortality after 1993 has been 0%.

	Breast Cancer Specific Survival	Overall Survival
1 year	99.7%	99.4%
3 years	96.5%	95.3%
5 years	93.3%	90.7%
8 years	89.1%	84.4%
10 years	87.6%	80.8%

Conclusions: The postoperative mortality rate after breast cancer resection is extremely low. The immediate postoperative deaths that occurred less than 30 days were due to surgical complications, occurred during the 1980s, and were not attributed to cancer. All perioperative deaths occurred in patients of advanced age. With improved diagnostic methods and perioperative medical care, no immediate perioperative deaths occurred during the last 25 years. These data confirm the extremely low operative risk of breast cancer resection.

0112 Redefining Breast-Conserving Surgery: Margins vs Cosmesis

Bonnie Sun[2,1], Nirav B. Savalia[2,1], Melvin J. Silverstein[2,1]
[1]*Breast Program, Hoag Memorial Hospital Presbyterian, Newport Beach, CA, USA,* [2]*Division of Surgical Oncology, Keck School of Medicine, University of Southern California, Los Angeles, CA, USA*

Objectives: The goals of breast-conserving surgery include adequate tumor resection with clear margins and an acceptable cosmetic result. The average lumpectomy removes 20-30 g of tissue and results in positive margins 30-40% of the time. The reported re-excision rates are as high as 40-50%. Larger excisions, while more like to achieve wider margins, can result in deformity and asymmetry. Oncoplastic reduction excision reconciles these 2 opposing goals, allowing larger local excisions which result in wider margins while achieving improved cosmesis.

Method: A prospective, single institution database was analyzed for patients with invasive and noninvasive breast cancer who underwent breast-conserving surgery, using a standard or split Wise-pattern reduction excision, from 2008 to 2011. Skin overlying the tumor was removed in all cases. Tumor size, margin width, and cosmetic outcomes were analyzed.

Results: Ninety patients underwent oncoplastic resection, using reduction techniques. The average weight of resected tumor specimens was 146.3 g. The average size of invasive tumors was 25.8 mm and of DCIS was 33.1 mm. The average span of the entire lesion was 35.1 mm. Thirty-eight of 90 patients had margins equal to or greater than 10 mm. The number of patients achieving various margin widths is tabulated below for tumors equal to or less than 50 mm (n = 68) and for tumors greater than 50 mm (n = 22).

Tumor Size ≤50 mm on Final Pathology

Closest Margin	Number of Patients	Percent
Nontransected	67	98.5%
≥ 1mm	64	94.1%
≥ 2mm	59	86.8%
≥ 5mm	46	67.6%
≥ 10mm	30	44.1%

Tumor Size >50 mm on Final Pathology

Closest Margin	Number of Patients	Percent
Nontransected	19	86.4%
≥ 1mm	12	54.5%
≥ 2mm	10	45.5%

Eighty-nine patients (98.9%) had improved appearance when evaluated by physicians. One patient (1.1%), who developed a postoperative infection and mild lower inner quadrant tissue loss, had a decreased cosmetic result. Twenty-five patients completed satisfactions surveys; 18 of 25 (72%) answered that the aesthetic results were beyond their expectations, rating it 5 on a 1-5 scale (5 being best). The remaining 7 patients scored their outcome as very good (rating it 4). All patients would recommend this procedure to others. Because of close margins, 4 patients (4.4%) were re-excised prior to radiation therapy and 2 patients were converted to mastectomy (at their request). There were no local recurrences after 14.5 months of follow-up.

Conclusions: Oncoplastic reduction excision for breast cancer resolves the needs of 2 opposing goals: margins vs cosmesis. It allows larger excisions, resulting in lower positive margin rates, while improving cosmetic outcome. Oncoplastic reduction excision was more effective for T1 and T2 tumors than for T3 tumors. Re-excision rates were much lower than the rates reported in the literature for standard lumpectomy. Oncoplastic reduction redefines the goals of breast-conserving surgery and should be considered for breast cancer patients who are candidates for breast-conserving surgery.

0043 Breast Cancer Recurrence Following Mastectomy for DCIS

Bonnie Sun[2,1], Shauna Werth-Kronfuss[2,1], Melvin J. Silverstein[2,1]
[1]Breast Program, Hoag Memorial Hospital Presbyterian, Newport Beach, CA, USA, [2]Division of Surgical Oncology, Keck School of Medicine, University of Southern California, Los Angeles, CA, USA

Objectives: The USC Van Nuys Prognostic Index (USC/VNPI) is a numeric algorithm (based on age, tumor size, nuclear grade, presence of necrosis and margin width) used to predict the risk of local recurrence after breast-conserving surgery in patients with DCIS. We expanded the use of this tool by using it to predict local recurrence after mastectomy for DCIS.

Method: We reviewed a prospective database of 5,271 patients with breast cancer, 1,565 of whom had pure DCIS. All DCIS patients were assigned a score from 4-12 using the USC/VNPI and then divided into 2 groups: those who scored from 4-9 and those who scored from 10-12. Survival and risk of recurrence were calculated using the Kaplan-Meier method.

Results: Between 1979 and 2011, 533 patients with pure DCIS were treated with mastectomy. Average follow-up was 82 months. A total of 12 patients developed recurrence. Two patients developed distant invasive breast cancer without developing an ipsilateral (skin flap or chest wall) breast tumor recurrence. Ten patients developed an ipsilateral recurrence: 2 were DCIS and 8 were invasive breast cancer. One patient with an invasive ipsilateral breast cancer subsequently developed distant metastases. All 12 patients who developed invasive or non-invasive breast cancer had multifocal disease; 9 of the 12 had multicentric disease. Outcome by USC/VNPI are listed below.

USC/VNPI Score	4-9	10-12	p value
n	273	260	
Mean age	55 years	47 years	
Mean size	27 mm	61 mm	
Mean nuclear grade	2.04	2.73	
Local recurrence only	1	9	0.02
Local recurrence then distant metastasis	0	1	NS
Distant metastasis only	0	2	NS
Invasive recurrence	1	11	0.01
12-year risk of invasive breast cancer	0.2%	9.7%	< 0.001

Conclusions: DCIS patients who scored 10-12 using the USC/VNPI were significantly more likely to develop recurrence after mastectomy, compared with patients scoring 4-9. At particularly high risk were young patients with large, high-grade tumors and close or involved mastectomy margins. For every 100

patients with USC/VNPI scores of 10-12, 10 patients will recur by 12 years and 1 to 2 will develop distant metastases. Since most recurrences are local, these data should be used when counseling a patient who is considering postmastectomy radiation therapy. The risk of recurrence with metastasis in DCIS treated with mastectomy is extremely low (<0.6%), even with a high USC/VNPI. No one with USC/VNPI <10 developed metastatic disease.

0094 Is Excisional Biopsy Necessary After a Core Needle Biopsy Diagnosis of Benign Papillary Lesion?

Ryan E Swapp, Hannah M Brands, Katie N Jones, Katrina N Glazebrook, Tina J Hieken, Daniel W Visscher, Carol Reynolds
Mayo Clinic, Rochester, MN, USA

Objective: The goal of this study is to determine whether surgical excision of benign solitary intraductal papillomas (BSIP) diagnosed by core needle biopsy (CNBx) and concordant with imaging is justified.
Method: A retrospective study of all papillary lesions diagnosed by CNBx from January 2003 to June 2010 was performed with institutional review board approval. All available histologic materials were evaluated by 2 pathologists without knowledge of the original histologic diagnosis or patient outcome. The papillary lesions were designated as benign, atypical, or malignant. All immediate and delayed excisional materials were reviewed. Any discrepant case was reviewed by a third "tiebreaker" pathologist. Details regarding clinical presentation, core biopsy technique, histopathologic concordance, surgical excision, and follow-up imaging were recorded.
Results: A total of 255 papillary lesions diagnosed on CNBx and with concordant imaging were identified in our cohort. Of these, 202 (79%) were classified as benign, 40 (16%) atypical, and 13 (5%) malignant. Sixteen benign cases (8%) were excluded due to a high-risk lesion or concurrent malignancy in the same quadrant of the breast. Of the 186 women (mean, age 57.2; range, 27-92 years) with a BSIP, the most common clinical presentation was abnormal screening mammogram (42%), followed by nipple discharge (28%) and palpable mass (18%). On imaging, the average lesion size was 0.9 cm (range, 0.3-4.0 cm). The most frequent needle gauge utilized for biopsy was 14 gauge (47%), followed by 9 gauge (28%), 11 gauge (9%), and 16 gauge (9%). Ultrasound guidance was used most frequently (95%), followed by stereotactic (3%) and magnetic resonance imaging (2%). Of the BSIPs, 54 women (29%) underwent immediate excision. Surgical excision resulted in 47 (87%) benign papillomas, 1 (2%) papilloma with atypical ductal hyperplasia (ADH), and 4 (7%) no residual papilloma. Two (4%) women underwent mastectomy for an ipsilateral invasive carcinoma in a different quadrant and the initial papilloma CNBx site was not sampled. Thirteen (7%) women underwent delayed excision, with 11 of these at the same biopsy site as the prior CNBx. Ten (91%) were benign papillomas and 1 (9%) was papilloma with ADH. Of the remaining 118 women with a BSIP diagnosed on CNBx, 80 (68%) women were found to be stable at last follow-up (4.8-93.8 months; mean, 35.0 months) and 38 (32%) women were lost to follow-up. For 186 BSIPs diagnosed on CNBx, only 2 (1.1%) were upgraded to ADH, none were malignant.
Conclusions: The likelihood of diagnosing atypia or malignancy after surgical excision of a benign solitary intraductal papilloma diagnosed on CNBx is extremely low. In our cohort, only 1.1% of BSIPs diagnosed on CNBx, without associated high-risk lesion or concurrent malignancy in the same quadrant, were upgraded to atypia. This data justifies close imaging follow-up rather than surgical excision of BSIPs diagnosed on CNBx in this distinct subset of patients with concondant imaging findings.

0236 Tumor Response to Neoadjuvant Chemotherapy Compared to Neoadjuvant Endocrine Therapy in Postmenopausal Women With Estrogen Receptor Positive Stage 2 to 3 Breast Cancer

Yolanda Tammaro, Gregory Moses, Amy Eastman, Yan Peng, David Euhus, A. Marilyn Leitch
UT Southwestern Medical Center, Dallas, TX, USA

Objectives: Assessment of Residual Cancer Burden (RCB) has been proposed by MD Anderson Cancer Center as a prognostic tool for breast cancer patients treated with neoadjuvant chemotherapy. Previous studies demonstrated that neoadjuvant therapy reduced tumor proliferative index (Ki67 expression). In this study, we examined both RCB and Ki67 expression in postmenopausal women with estrogen receptor (ER) positive stage 2 or 3 breast cancer. By evaluating pathologic tumor response to neoadjuvant chemotherapy compared to neoadjuvant endocrine (aromatase inhibitor) therapy, we sought to determine if endocrine therapy is an appropriate low toxicity alternative to chemotherapy in the neoadjuvant setting in postmenopausal patients with stage 2 or 3 breast cancer.

Method: From a single-institution database, we identified 18 stage 2 or 3 breast cancer patients receiving neoadjuvant aromatase inhibitor therapy and 18 stage 2 or 3 patients receiving neoadjuvant chemotherapy from 2006-2011. Clinical response, pathologic response (RCB), and modulation of proliferation (Ki 67 expression) were assessed.
Results: In the neoadjuvant chemotherapy (NC) group, 50% of patients exhibited a partial clinical response, 5.5% stable disease, 28.9% complete clinical response, and 5.5% progressed. This was significantly different from the aromatase inhibitor (AI) group, where 57.9% exhibited a partial clinical response, 31.6% stable disease, and 10.5% complete clinical response ($x^2 = 12.69$, $p = 0.0054$). However, with respect to pathologic response, in the NC group, RCB was class II for 37.5% of tumors and class III for 62.5% of tumors. This did not differ significantly from the AI group where RCB was class II for 47.4% of tumors and class III for 52.6% of tumors ($x^2 = 0.35$, $p = 0.8395$). Eighty-eight percent of patients in the AI group demonstrated a reduction in ki67, compared to 53% in the NC group. In the AI group, 76.5% of patients exhibited reduction of ki67 to $\leq$ 10%, compared to only 6.7% in NC group.
Conclusions: Neoadjuvant aromatase inhibitor therapy in postmenopausal women with ER- positive stage 2 or 3 breast cancer significantly reduced proliferation and was associated with RCB similar to those treated with neoadjuvant chemotherapy. This suggests that neoadjuvant AI therapy is a reasonable, less toxic alternative to neoadjuvant chemotherapy in postmenopausal ER-positive breast cancer patients. Nearly half of the patients in the AI group had an intermediate RCB of II. In the MD Anderson study, patients treated with neoadjuvant chemotherapy who had an RCB of II had a better prognosis than those with an RCB III. A combination of pathologic assessment of RCB and Ki67 may identify a favorable prognostic cohort among patients treated with neoadjuvant endocrine therapy who may avoid additional adjuvant chemotherapy despite having residual disease.

0211 Human Breast Cancer Associated Fibroblasts Exhibit Subtype-Specific Gene Expression Profiles

Julia Tchou[1,2], Andrew Kossenkov[2], Lisa Chang[2], Celine Satija[1], Meenhard Herlyn[2], Louise Showe[2], Ellen Pure[2]
[1]Department of Surgery, Division of Endocrine and Oncologic Surgery, Rena Rowan Breast Center, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA,USA, [2]Wistar Institute, Philadelphia,PA, USA

Objectives: Breast cancer is a heterogeneous disease for which prognosis and treatment strategies are largely governed by the receptor status (estrogen, progesterone and Her2-neu) in the tumor cells. Gene expression profiling of whole-breast tumors further stratified breast cancer into several molecular subtypes which co-segregated with the receptor status of the tumor cells. Because these molecular signatures were derived from tumor samples which invariably contained tumor stroma, we postulate that cancer associated fibroblasts (CAFs) within the tumor stroma may contribute to the molecular phenotype of breast cancer by exhibiting subtype specific gene expression profiles. Several studies have reported gene expression profile differences between cancer-associated fibroblasts (CAFs) and normal breast fibroblasts, but *none of these studies have stratified their results based on tumor subtypes*. Our study is to evaluate whether breast CAFs have subtype specific differences.
Method: We isolated primary cultured CAFs from 20 human breast cancer samples, representing 3 molecular subtypes [7 ER(+), 6 triple-negative breast cancer (TNBC), and 7 Her2-neu (+)] and compared their gene expression profiles.
Results: We observed significant expression differences between CAFs derived from Her2-neu+ breast cancer and CAFs from TNBC and ER(+) cancer, particularly in pathways associated with cytoskeleton and integrin signaling. These differences were subsequently validated on a new set of independent samples.
Conclusions: In conclusion, our results showed that subtype-specific changes exist in CAFs, which provided molecular evidence supporting the tumor stroma co-evolution hypothesis highlighting the reciprocal role of a possible subtype-specific tumor microenvironment in the enrichment of a specific cancer subtype and vice versa. In the case of Her2-neu(+) breast cancer, a more aggressive breast cancer subtype with known increased risk of local and distant recurrence, CAFs may employ these augmented signaling pathways to promote the invasive properties of the tumor cells.

0101 The Effect of Breast Cancer Treatment on Quality of Life

Apoorva Tewari, Tish Knobf, Donald Lannin, Erin Hofstatter, Tara Sanft, Susan Higgins, Brigid Killelea, Joanne Weidhaas, Maysa Abu-Khalaf, Ruth McCorkle, Anees Chagpar
Yale University, New Haven, CT, USA

Objectives: Breast cancer is the leading malignancy affecting women in the United States, and treatment is highly effective, yet little is known regarding the impact of adjuvant treatment on quality of life. We sought to determine the effect of various treatment regimens on both psychosocial and physical health in a population-based sample.

Method: The National Health Interview Survey is the largest source of health information for the U.S. population, and is conducted annually by the Centers for Disease Control. We obtained data from the 2010 survey, which asked breast cancer survivors about their treatment regimens and current quality of life. Data were analyzed using SAS-callable SUDAAN software.

Results: There were 2,316 individuals surveyed, of whom 406 (17.5%) had a history of nonrecurrent primary breast cancer. Data regarding adjuvant treatment were unavailable for 52 individuals (12.8%). Of the remaining 354 patients, 291 (82.6%) were treated with surgery and formed the cohort of interest. The median time from diagnosis was 9.9 years. Type of adjuvant treatment (defined as radiation therapy, chemotherapy, and/or hormonal therapy) correlated with education ($p = 0.002$), insurance status ($p = 0.032$), race ($p = 0.005$), and age at diagnosis ($p = 0.006$). Data regarding tumor size, lymph node status, hormone receptors, and tumor grade were not collected in this population-based survey. On univariate analysis, there was no significant correlation between patients who received any kind of adjuvant therapy and those who received surgery alone in terms of overall quality of life ($p = 0.533$), or physical health ($p = 0.431$). However, those receiving adjuvant therapy were less likely to report "excellent" mental health status (as elicited by the question, "How would you rate your mental health, including your mood and your ability to think?") than those who did not (23.1% vs 30.7%, $p = 0.023$). Similarly, type of adjuvant treatment was not correlated with patients' reported overall quality of life ($p = 0.231$) or physical health ($p = 0.247$). However, there was a significant relationship between type of treatment and reported mental health, satisfaction with social activities and relationships, and ability to carry out usual social activities and roles (see table below). Controlling for education, insurance status, race and age at diagnosis, on multivariate analysis, adjuvant treatment remained a significant independent predictor of reporting "excellent" mental health status ($p = 0.006$), but was no longer significant in terms of satisfaction with social activities and relationships ($p = 0.619$). Evaluating surgery, radiation, chemotherapy, and hormonal therapy individually as dichotomous variables, there was no significant correlation between each type of treatment and mental health status reported ($p = 0.687$, $p = 0.365$, $p = 0.915$, $p = 0.633$, respectively).

		# (%) Reporting "Excellent"		
Treatment	**N (%)**	**Mental Health**	**Satisfaction With Social Activities and Relationships**	**Ability to Carry Out Usual Social Activities and Roles**
Surgery alone	113 (35.3%)	34 (30.7%)	34 (28.7%)	37 (34.2%)
Surgery and XRT	37 (12.8%)	4 (13.2%)	11 (34.7%)	11 (33.8%)
Surgery and CT	34 (12.7%)	4 (18.9%)	7 (30.7%)	7 (35.8%)
Surgery and HT	16 (7.3%)	1 (5.1%)	2 (12.3%)	3 (10.4%)
Surgery, XRT, and CT	47 (13.9%)	14 (41.2%)	13 (39.4%)	12 (31.6%)
Surgery, XRT and HT	19 (9.2%)	5 (19.0%)	5 (28.1%)	4 (14.7%)
Surgery, CT and HT	11 (3.9%)	4 (44.3%)	6 (59.1%)	6 (59.1%)
Surgery, XRT, CT, and HT	14 (4.9%)	1 (17.0%)	6 (45.3%)	8 (50.1%)
Univariate P value		**0.019**	**0.002**	**0.004**
Multivariate P value		**0.006**	**0.619**	**0.066**

Conclusions: While type of adjuvant treatment for breast cancer does not affect overall quality of life or reported physical health status of survivors, it does play a role in patients' mental health independent of other sociodemographic factors. In addition, while each type of therapeutic modality, when considered in

isolation, does not seem to affect mental health, the combination of therapy may significantly affect this aspect of quality of life.

0210 How Risky Are High Risk Lesions? Surgical Excision vs Observation for High-Risk Breast Lesions

Andrew Van Osdol[1], Jeffrey Landercasper[1], Jeremiah Andersen[1], Jake Gundrum[1], Jeanne Johnson[1], Erin Gensch[1], Richard Ellis[1,2], Brooke De Maiffe[1], Kristen Marcou[1]
[1]Gundersen Lutheran Medical Foundation, La Crosse, WI, USA, [2]Three Palm Software, Los Gatos, CA, USA

Objectives: Upgrades to breast cancer are reported in 5-40% of patients when a needle biopsy (NB) identifies a high-risk lesion (HRL) that is followed by surgical excisional biopsy. Few studies document the selection criteria utilized for observation of patients with HRL or the outcomes of patients that do not undergo excision. This study was designed to determine the following: (1) institutional upgrades of HRL, (2) factors effecting upgrades, (3) method of selection for observation, and (4) outcomes of observed patients.

Method: We performed a retrospective review of a prospective database for all patients undergoing needle biopsy (NB) from 2001- 2006, in order to obtain 5-year follow-up of patients who did not undergo excision after NB. Inclusion criteria were an NB pathology report indicating atypical ductal hyperplasia, atypical lobular hyperplasia, lobular carcinoma in situ, flat epithelial atypia, papillary lesion, radial scar, or other HRL. NB techniques were most often 14-gauge core NB or 11-gauge vacuum-assisted. Rigorous histology criteria, supported in the literature, were used to discriminate ADH from DCIS on NB. The choice of excision vs observation in patients with HRL was made after collaborative and formalized clinical examination/imaging/pathology concordance assessment performed by radiologists, pathologists, and surgeons. Personalized estimates of the chance of upgrade were then provided to patients as part of shared decision making during informed consent discussion of patient options. Fourteen clinical, imaging, and pathological factors, including method of detection, lesion palpability, imaging findings, lesion type, BI-RADS category, NB size, and pathologist “report wording” were reviewed for prediction of upgrade to malignancy. Statistical methods utilized were chi-square test (Fisher exact tests) for categorical evaluation and Wilcoxon rank-sum for follow-up times.

Results: A total of 500 consecutive patients were reviewed, with 101 having HRL on NB. Thirty-one (30%) of these 101 patients underwent observation only with no reported cancer at last follow-up (median, 5.8; range, 0-10 years,). The remaining 70 (70%) patients underwent surgical biopsy with 19 (27%) of 70 upgraded to malignancy (13 DCIS, 6 invasive). Recommendation for surgical excision by a breast subspecialty pathologist was associated with upgrade to malignancy (p value, 0.003); 9/15 (60%) patients recommended for excision were upgraded to malignancy; 10/55 (18%) not recommended were upgraded. Upgrades to malignancy occurred in 0% (0/10), 28% (15/53), and 100% (2/2) of patients with BI-RADS 3, 4, and 5, respectively (p value, 0.009). None of the other factors reviewed were found to have a statistically significant association with upgrade to malignancy.

Conclusions: Our results support the concept that some HRL patients may safely avoid surgical excision. Our institutional upgrade of HRL to malignancy when NB is followed by excision is 27%, but there were no missed cancers at last follow-up in selected patients who did not undergo excision. Breast subspecialty pathology expertise and BI-RADS scoring help estimate chance of upgrade. A structure and policy of collaborative interdisciplinary care with formalized concordance assessment resulted in our observed HRL patients having a risk of interval cancer development in the BI-RADS 3 range of less than 2%.

0249 A Combined Institutional Review of Prognostic Factors in Locally Advanced and Inflammatory Breast Cancer

Rebecca K. Viscusi[1], Haiyan Cui[1], Barbara A. Pockaj[2], Erica H. Salinas[1], Gabrielle Brown[1], Lauren LeBeau-Grasso[1], Victor Gonzalez[1], Ana Maria Lopez[1], Michele Ley[1], Julie E. Lang[1]
[1]The University of Arizona Health Network, Tucson, AZ, USA, [2]Mayo Clinic, Scottsdale, AZ, USA

Objectives: Inflammatory breast cancer (IBC) is rare and characterized by its aggressive nature and poor overall survival (OS). We hypothesized that IBC patients have a higher prevalence of estrogen receptor (ER), progesterone receptor (PR), and HER2 negative cancers with a poorer prognosis than triple-negative (TN) locally advanced breast cancer (LABC).

Method: We performed a retrospective review of female patients with nonmetastatic LABC (stage IIB, III) or IBC treated at the University of Arizona Cancer Center (AZCC) in Tucson, Arizona, and the Mayo Clinic (MC) in Scottsdale, Arizona, from 1999 to 2009. Primary endpoints included overall (OS), locoregional recurrence-free survival (LRFS), and metastatic-free survival (MFS). Statistical analysis was performed with the Fisher exact test and the Kaplan-Meier method. The Cox proportional hazards model was used for multivariate analysis controlling for patient characteristics, prognostic factors, and treatment modalities.
Results: A total of 426 patients, 194 from AZCC and 232 from MC, were examined, including 33 (7.7%) IBC patients and 393 (92.3%) LABC patients. Mean follow-up was 4.7 years (range, 0.03-16.8 years). A total of 62 (14.6%) patients had TN cancers. OS was worse in TN compared to non-TN patients ($p < 0.0001$). There was a significantly higher prevalence of TN cancers in IBC patients ($p = 0.004$) with 11 (33.3%) IBC patients and 50 (12.7%) LABC patients having TN disease. Furthermore, TN IBC patients had a significantly decreased OS when compared to TN LABC patients ($p = 0.03$). Larger tumor size, presence of lymphovascular (LVI) or dermal lymphatic invasion (DLI), lack of ER/ PR expression, elevated Ki67, and TN disease were associated with decreased OS ($p < 0.05$). Treatment factors associated with improved OS included adjuvant chemotherapy ($p = 0.0004$) and hormonal therapy ($p < 0.0001$), while neoadjuvant chemotherapy was associated with decreased OS ($p = 0.0003$). On multivariate analysis, only TN status ($p = 0.007$, HR 4.7) and failure to receive adjuvant chemotherapy ($p = 0.03$, HR 2.7) remained significant. IBC patients were significantly more likely than LABC patients to receive neoadjuvant chemotherapy ($p < 0.0001$), trastuzumab ($p = 0.02$), as well as adjuvant chemotherapy ($p = 0.001$) and radiation ($p = 0.02$). Despite this, OS for IBC patients was worse ($p < 0.0001$). Decreased LRFS was significantly associated with higher grade, presence of LVI or DLI, lack of ER/PR expression, elevated Ki67, and TN disease ($p < 0.05$) with only presence of LVI remaining significant on multivariate analysis ($p = 0.007$, HR 3.9). Similarly, higher grade, presence of LVI or DLI, lack of ER/PR expression, TN disease, and neoadjuvant chemotherapy were associated with decreased MFS, while hormonal therapy was associated with increased MFS ($p < 0.05$). On multivariate analysis for MFS, neoadjuvant chemotherapy ($p = 0.007$, HR 0.5), adjuvant chemotherapy ($p = 0.05$, HR 1.6), and TN disease ($p = 0.007$, HR 2.7) remained significant.
Conclusions: Despite more aggressive treatment, patients diagnosed with IBC continue to have a significantly worse OS. IBC is associated with more unfavorable tumor characteristics and a higher prevalence of TN tumors. In addition, TN IBC patients had a poorer prognosis when compared to TN LABC patients. The poor prognosis of IBC reflects an inherently aggressive subtype of breast cancer, beyond what can be explained by TN biology alone.

0075 Feasibility of Nipple-Sparing Mastectomy: One Community Hospital's Experience
Betsy Washburn[1,2], Nayana Dekhne[1,2], Mike Meininger[1,2]
[1]Oakland University William Beaumont School of Medicine, Royal Oak, MI, USA, [2]William Beaumont Hospital, Royal Oak, MI, USA
Objectives: Recent studies and reviews of surgical outcomes have supported nipple-sparing mastectomy as a safe and cosmetically beneficial option for patients seeking risk reduction, as well as selective patients with early-stage breast cancer. This study reports 1 surgeon's short- and mid-term postoperative outcomes of nipple-sparing mastectomies at a community hospital.
Method: The study enrolled 43 participants who chose to undergo NSM based on oncologic safety, anatomic eligibility, as well as patient preference. Fifty patients underwent 72 NSMs at our institution from October 2008 to October 2011. Indications for the surgery were 59 (82%) for prophylaxis, 5 (7%) for DCIS, and 8 (11%) for invasive ductal carcinoma. One patient was found to have DCIS in a prophylactic mastectomy specimen with a clean margin. The average patient age was 43.9 years (range, 28 to 61 years). For those patients with mastectomy for invasive ductal carcinoma, the average tumor size was 2.4 cm and all tumors were peripherally located. The stage of the breast cancers ranged from IA to IIB [IA (3), IIA (3), IIB (2)].
Results: Thirty-four mastectomies were performed through an inframammary incision, while 38 mastectomies were carried out through a radial incision. Fifty-one immediate reconstructions with implants were performed at the time of oncologic resection, while 21 tissue expanders were placed with final reconstruction at a later date. Acellular dermal matrix was utilized in 55 (76.3%) of the reconstructions. The nipple areolar complex was preserved in 68 (94.4%) mastectomies. A review of the major and minor complications notes 4 major complications of nipple loss. One patient had bilateral

ischemic nipple loss 3 weeks postop, requiring surgical excision. Two patients had unilateral mastectomy specimens with a close nipple margin on final pathology requiring excision of the nipple areola complex at a second surgery. Two patients required postoperative chest wall radiation. One of these patients had implant loss after the completion of radiation therapy secondary to wound breakdown. Implant revision was performed due to cosmesis or wound issues in 8 (18.6%) patients. At the time of reporting, there was a median follow-up of 18.4 months (range, 4-41 months), and no local or systemic recurrences were noted for patients being treated for cancer. Cosmesis was noted as good or excellent in 40 (93%) patients, while 3 (7%) patients noted fair cosmesis due to implant wrinkling.
Conclusions: The short-term data review shows that NSM can be performed safely and with good cosmetic outcomes for prophylaxis even in a community hospital setting. Long-term data will be needed to show the safety of performing NSM for patients with DCIS and invasive breast cancer. Long-term follow-up will also assist in better characterizing the selection criteria for patients who are the best candidates for NSM.

0065 Risk of Breast Cancer With Papillary Lesions
Cynthia Weber, Anne Horst, Sharfi Sarker
Loyola University Medical Center, Maywood, IL, USA
Objectives: The purpose of this study was to evaluate whether the diagnosis of a papillary lesion on core biopsy was a predictor for breast cancer on excision.
Method: The pathology records at our institution were queried for the diagnosis of a papillary lesion on core biopsy between the years 1999 and 2011. Electronic and paper charts were then retrospectively reviewed for patient demographic data, clinical and imaging findings, and breast cancer risk factors. Pathology reports of those patients who underwent excision were reviewed. Chi-square, Fisher exact, and ANOVA analysis were performed to identify associations between clinically significant variables and final pathology.
Results: There were 147 core biopsies with a diagnosis of a papillary lesion in 132 patients. Fifty-four patients with a concurrent diagnosis of breast cancer [20 infiltrating ductal (IDC) or lobular (ILC) carcinoma, 18 ductal carcinoma in situ (DCIS), 6 papillary carcinoma] were excluded from the study. Fifty-two (55.9%) of the remaining 93 patients underwent excision. Other high-risk lesions [12 atypical ductal hyperplasia (ADH), 2 atypical lobular hyperplasia (ALH), 1 lobular carcinoma in situ (LCIS)] were identified in 15 patients. Breast cancer was diagnosed in 10 (19.2 %) patients: 5 were diagnosed with DCIS, 3 with papillary carcinoma, and 2 with IDC. Of those 10 patients, 7 had no other high-risk lesions (ADH, ALH, or LCIS) identified. Calcifications on mammogram was found to be an independent predictor of breast cancer on excision ($p = 0.01$). Age ($p = 0.55$), 5-year ($p = 0.25$) or lifetime ($p = 0.79$) Gail risk score, family history of breast cancer ($p = 0.51$), finding of atypia ($p = 0.10$), and smoking status ($p = 0.95$) were not associated with a finding of cancer on excision. Six patients developed breast cancer more than 1 year after excision of the index papillary lesion (3 contralateral, 3 ipsilateral). Follow-up beyond 1 year was available for 30 (56%) patients who did not undergo excision initially. Five of those patients (16.7%) subsequently developed breast cancer (2 contralateral, 3 ipsilateral).
Conclusions: In our study, 19.2% of the patients diagnosed with a papillary lesion on biopsy were found to have cancer on further excision. Thus, we feel that papillary lesions should be considered high-risk lesions and recommend excision when found on core biopsy. Larger numbers in future studies would allow for more robust interpretation of the data and identify additional risk factors.

0132 Patient Navigation and the Quality of Breast Cancer Care
Joseph Weber[1], Debra Mascarenhas[1], Lisa Bellin[1], Rachel Raab[1], Jan Wong[1,2]
[1]East Carolina University, Brody School of Medicine, Greenville, NC, USA, [2]University of North Carolina, Lineberger Comprehensive Cancer Center, Chapel Hill, NC, USA
Objectives: Patient navigation programs were initiated to help guide patients through barriers in a complex cancer care system. Thirty-six breast cancer care quality indicators (BCCQI) have been defined by the National Initiative for Cancer Care Quality (NICCQ). We sought to analyze the impact of our patient navigator program on the adherence to specific BCCQIs associated with surgery, systemic adjuvant therapy, and respect of patient preferences and inclusion in decision-making domains of the NICCQ.
Method: A retrospective cohort of patients with stage I-III breast cancer seen the calendar year prior to the initiation of the patient navigation program were reviewed and compared to patients treated in the ensuing 2 calendar years. Quality indicators deemed appropriate for analysis were those associated with

overcoming barriers to treatment and those associated with providing health education and improving patient decision making. Because annual mammographic screening in noninvasive breast cancer is recommended, this specific indicator (have a mammogram in the last 12 months) was examined in this subset of patients.
Results: A total of 134 consecutive patients, between January 1, 2006, and December 31, 2006, the year preceding the nurse navigation program, and 234 consecutive patients between January 1, 2008, and December 31, 2009, were evaluated for compliance with the BCCQI. Sixty-five patients had noninvasive cancer. There was a similar age distribution between the 2 study populations (59.7 yr, pre, vs 57.6 yr, post; p = 0.12) and race distribution (53% White, pre, vs 54%, post; p = 0.85). In all 10 BCCQIs evaluated, there was improvement in the percentage of patients in compliance with the quality indicator. Indicators associated with informed decision making and patient preference achieved statistical significance, while only completion axillary node dissection in sentinel node positive biopsies in the process of treatment achieved statistical significance.

BCCQI	Prenavigation (%)	Postnavigation (%)	P value
BR-1B1 (axillary node sampling performed)	98.53 (67/68)	100 (134/134)	0.16
BR-1B2 (completion axillary node dissection in SN+ Pts)	90.5 (19/21)	100 (73/73)	0.007
BR-2B1 (start endocrine therapy in ER+ or PR+ disease)	84.2 (48/57)	92.6 (113/122)	0.08
BR-2B3 (<50y, T2 and/or N+ receive chemo tx)	85.7 (12/14)	96.5 (55/57)	0.12
BR-2B5 (<50y, T2 and/or N+ starts chemo tx within 8 wk of last therapeutic surgery)	81.8 (9/11)	96.5 (55/57)	0.058
BR-2C2a (breast conservation surgery receives rad tx)	92.2 (47/57)	97.7 (84/86)	0.13
BR-2C3a (mastectomy with +margin or T3 or N2 receives rad tx)	90.0 (9/10)	97.7 (42/43)	0.25
BR-5-4 (stage I-III informed about BCS if undergoing mastectomy)	64.9 (24/37)	91.6(65/71)	0.0005
BR-5-5-1 (stage I-II informed of breast reconstruction option prior to mastectomy)	27.9 (12/31)	50.6 (40/79)	0.015
BR-7-2 (mammogram within last 12 months)	53.5 (53/99)	80.5 (140/174)	0.0001

Conclusions: The implementation of a patient navigator program improved the percent of patients whose care is in compliance with all 10 BCCQI examined. The greatest impact was observed on patient preferences and inclusion in decision-making domains. The impact, if any, on relapse-free and overall survival remains to be determined.

0208 Oncoplastic Breast Surgery: Benefits and Limitations
Dawn Wedman, Ting Hua Zhang, Angel Arnaout
Ottawa Hospital Women's Breast Health Center, Ottawa, ON, Canada
Objectives: Breast conservation therapy is a valuable part of breast cancer treatment, with equivalent survival outcome to that of mastectomy. Recently, oncoplastic surgery has been popularized as a method to improve margins and yield better aesthetic outcomes when traditional lumpectomy either anticipates poor results or is not possible. This study was undertaken to examine the oncologic benefits and limitations of this technique in providing adequate breast conservative therapy.
Method: This was a retrospective review of the surgical outcomes of all patients offered breast-conserving therapy at a tertiary care hospital from 2008 to 2011. Patients were divided into 3 groups: the traditional lumpectomy group (no attempt was made to close the defect), oncoplastic level I group (less than 20% of the breast tissue excised; general undermining to close the defect), and oncoplastic level II group (skin resection, greater than 20% of the breast tissue excised), which included batwing resection,

Binelli mastopexy, reduction, and J/raquet mammoplasties. A survey was performed to assess patient satisfaction.
Results: A total of 237 patients had lumpectomies during this period; 106 patients in the traditional, 97 patients in level I, 34 patients in the level II oncoplastic group. There was no significant difference in the age, cancer stage, proportion of DCIS vs invasive disease, histology of invasive disease, ER, PR, Her 2 status, and postoperative complication rate between all 3 groups. No statistically significant difference in the ability to get wide margins ($p = 0.09$) or in the re-excision rate ($p = 0.66$) between either of the oncoplastic and the traditional groups. However, the level II oncoplastic group had a better ability to provide adequate resection for multifocal ($p = 0.03$) and larger T stage ($p = 0.01$) tumors, but only when DCIS was excluded. Oncoplastic surgery achieved adequate resection of tumors in cosmetically difficult areas such as the lower inner/lower outer quadrants ($p = 0.01$) and a high level of patient satisfaction was noted.
Conclusions: Oncoplastic surgery level II techniques extend the scope for breast-conserving surgery, allowing for resection of the larger and multifocal tumors in traditionally cosmetically difficult quadrants of the breast, without greater postoperative complication rates.

0002 Evaluating the Sensitivity and Specificity of Breast-Specific Gamma Imaging vs Magnetic Resonance Imaging Prompted Second-Look Imaging
Stephanie Williams, Claire Edwards, Anita McSwain, Jocelyn Rapelyea, Jessica Torrente, Rachel Brem, Christine Teal
The George Washington University, Washington, DC, USA
Objectives: Breast-specific gamma imaging (BSGI) is a molecular imaging technology that allows for highly sensitive detection of breast lesions, compared to mammography and ultrasound. In this study, we compared whether BSGI or MRI prompted more second-look imaging and additional biopsies at our institution, and whether these biopsies proved to be true or false positives.
Method: Charts were reviewed from 276 sequential patients at our facility who had surgery for breast cancer from January 2008 to May 2010 and had preoperative evaluation with BSGI or MRI. Additional imaging was ordered to assess the extent of disease and to determine if there were any other lesions. We determined the number of patients advised to have second-look imaging following BSGI and MRI, and how many patients were then recommended to have a new area of concern biopsied. We then determined true and false positives in this group and compared the sensitivity and specificity of these imaging modalities using the 2-sample test of proportions to determine statistical significance, where $p < 0.05$ is considered significant.
Results: One hundred eighty-eight of 276 (68%) patients had BSGI and 88 (32%) patients had an MRI. Of the 188 patients who had BSGI, 39 (20%) were advised to have second-look imaging with ultrasound (31 patients) or MRI (8 patients). Subsequently, a total of 32 patients (89%) who had second-look imaging were recommended to have a biopsy of a new area of concern. Twenty-seven patients underwent the biopsy; of the 27 biopsies, 9 (33%) were abnormalities and 18 (66%) were benign. Of the 88 patients who underwent an MRI, 8 (9%) were recommended for second-look ultrasound; 7 underwent biopsy. Of the 7, 4 (57%) were true positives and 3 (42%) were false positives. The sensitivity and specificity of BGSI and MRI were calculated. Both BSGI and MRI were calculated to have 100% sensitivity, and therefore were not statistically different. Specificity was determined to be 96% for MRI, and 89% for BSGI. Using the 2-sample test of proportions to calculate the p value, a p value of 0.07 was derived and therefore was not statistically different.
Conclusions: Evaluation with BSGI and MRI both resulted in benign findings at biopsy. However, additional occult cancers were also identified with both technologies. We found MRI to have a higher specificity than BSGI. However, our sample size of patients with BSGI was significantly larger than our sample size of patients with MRI, and this is a limitation of our study. Our study demonstrated no significant difference in sensitivity and specificity of MRI and BSGI in cancer detection. BSGI appears to be equally effective as MRI in evaluating extent of disease and identifying additional foci of malignancy. It is more cost-effective and can be performed in all patients, even those with implantable devices, renal insufficiency, and obesity, all which can preclude imaging with MRI.

0109 Gadd45a Levels in Breast Cancer Are Hormone Receptor Dependent

Alliric Willis, Benjamin Powers, Jennifer Tront, Geoffrey Smith, Barbara Hoffman, Daniel Liebermann
Temple University School of Medicine, Philadelphia, PA, USA

Objectives: Gadd45 alpha (a) is a member of the Gadd45 family of genes that are known stress sensors. Gadd45a has been shown to serve as an effector in oncogenic stress in breast carcinogenesis in murine models. The aim of this study was to analyze the impact of Gadd45a as a modulator in human breast cancer depending upon breast cancer receptor status.

Method: Breast tissue samples were obtained of female breast surgery cases from an academic institution's pathology repository. Slides were prepared by surgical pathology laboratory. Immunohistochemistry (IHC) was performed using Gadd45a antibody. Slides were prepared in triplicate and read by three readers, including an attending pathologist in cytology, for percent staining of cellular cytoplasm.

Results: Thirty-eight female breast surgery cases were studied and grouped as: normal (7, benign mammoplasty), luminal A (8, ER+, PR+, HER2-; LumA), HER2+ (9, ER+, PR+, HER2+), and triple-negative (14, ER-, PR-, HER2-; TN). There was a highly significant difference in percent Gadd45a staining between groups [mean (± SE)]: normal, 17.4% (± 7.4); LumA, 84.8% (± 2.4); HER2+, 59.0% (± 11.6); TN, 25.4% (± 8.6), P<0.0001, ANOVA. Percent stained results for each specimen were averaged and categorized as: negative (0-<10%, Neg), low (10 - <40%), medium (40 - <70%, Med), or high (≥70%). Gadd45a IHC levels for normal cases found 86% neg or low. LumA breast cancer cases were found to be 100% high. Her2+ cases were 44% high, 33% med, 22% neg or low. TN cases were 79% neg or low. This difference in distribution of Gadd45a levels across breast cancer receptor subtypes was significant, P = 0.0008, Fisher exact test.

Conclusions: Gadd45a levels are highly significantly associated with hormone receptor status in human breast cancer. Normal breast tissue has low levels of Gadd45a. High Gadd45a levels are associated with LumA. HER2+ is associated with high and med levels. Absence of hormone receptor in TN breast cancer is associated with neg or low levels of Gadd45a. Further studies are indicated to elucidate the role of Gadd45a in breast cancer as a potential tumor suppressor, prognosticator, or target for treatment.

0117 Second-Node Biopsy Is Guided by 3D-CT Lymphography to Avoid the Axillary Node Dissection on Sentinel Node-Metastasized Patients

Koji Yamashita, Kazuo Shimizu, Shunsuke Haga
Nippon Medical School, Bunkyo-ku, Tokyo, Japan

Objectives: To avoid the axillary node dissection on the sentinel node (SN)-positive patients, the number of positive nodes should be 1 or 2, according to the results of ACOSG Z0011. However, the average sampled number of SN biopsy is almost around 2. We cannot deny the possibility of more than 2-node metastasis only by SN biopsy. 3D-CT mammary lymphography (LG) can show the detailed lymphatic system from the whole-breast tissue to SN and to deep axillary nodes. By using 3D-CT LG, we can perform precise SN biopsy and can sample the second and the third nodes after SN. The endoscopic biopsy of SN and the second node will help to avoid the axillary node dissection, with low invasive and better cosmetic procedure.

Method: 3D-CT LG was performed to mark SN on the skin before surgery. Above the tumor and near the areola, 2 ml of Iopamidol 300 was injected subcutaneously. Images of CT scan were taken at 1 and 3 min after injection to produce 3D images of lymph ducts and nodes. For the lymphoscintigraphy, 99mTc phytate 74mBq was injected, and SPECT was taken after 2 hours. We fused it with 3D-CT LG. SN biopsy was performed by dye and RI method. Two ml of 1% indocyanin green or indigocarmine was injected subcutaneously and, 20 min later, a 1-cm skin incision was made along wrinkles in the axilla at the position marked by 3D-CT LG. The endoscopic view was made through the optical trocar Visiport and showed stained lymph ducts and SNs, which can be navigated by the RI detector probe. The second nodes were removed by mapping of 3D-CT LG in relation to the RI-positive nodes. We dissected the axillary nodes on SN-positive patients by endoscopic technique.

Results: The endoscopic SN biopsy was performed on 260 patients. We can recognize the passage of lymph flow from SN into the venous angle. Even in the multiple SN case, the lymph ducts were converging into the second node. The lymph nodes after SN were detected in more than two thirds of patients in SN biopsy assisted by 3D-CT LG. The average sampled number of SN was 2.2. The patients with metastasized nodes were 52. Only SN metastasis was 22. The second node involvement was 8. The third-node involvement was 7. All patients without metastasis in the second and the third nodes had

metastasis only in SN. Therefore, they can be candidates to evade the axillary node dissection. There was no false-negative study. The endoscopic SN biopsy did not need any useless detachment around axillary nodes. The spatial projection of RI with the 3D-CT LG mapping on the body helped us to find SN and the second and the third nodes easily. They were low-invasive manipulation and made better cosmetic results.
Conclusions: 3D-CT LG can detect the precise lymphatic system, and can help the endoscopic biopsy of the second and the third nodes beyond SN. It should be needed to preserve the axillary node on SN-positive patients.

0231 Patient-Centered Care: Do All Teaching Hospitals Provide Greater Access to Breast Cancer Reconstruction?
Rachel Yang, Caroline Reinke, Andrew Newman, Ines Lin, Giorgos Karakousis, Brian Czerniecki, Liza Wu, Rachel Kelz
University of Pennsylvania, Philadelphia, PA, USA
Objectives: Patients undergoing mastectomy at teaching hospitals are more likely to have immediate breast reconstruction (IBR). To further understand this finding, we examined the impact of having an accredited plastic and reconstructive surgery (PRS) training program and/or general surgery (GS) training program on immediate postmastectomy breast reconstruction.
Method: Patients greater than 18 years old who had mastectomy were identified in the Pennsylvania Health Care Cost Containment Council inpatient database for 1994-2004. International Classification of Disease-9 procedure codes were used to identify patients who underwent IBR. Rates of IBR were examined by hospital type, as defined by the FREIDA listing of all sponsor and participant teaching hospitals for PRS and/or GS training programs. Hospital teaching status was assigned as having no surgical training program, only a GS training program, or both a GS and PRS training program. Multivariable logistic regression analysis was performed to evaluate the association between hospital teaching status and IBR with adjustment for age, race, median income, Elixhauser comorbidity index, year of mastectomy, and insurance type.
Results: We identified 35,206 patients who underwent a mastectomy during the study time interval. Of those patients, 49.98% underwent mastectomy at a nonteaching hospital, 19.51% at a hospital with a GS training program, and 30.51% at a hospital with both a GS and PRS training program. Of those patients who underwent IBR, 29.88% had their reconstruction performed at a nonteaching hospital, 26.30% at a hospital with a GS training program, and 43.82% at a hospital with both a GS and PRS training program. Patients were more likely to undergo IBR at a hospital with a GS training program or at a hospital with both a GS and PRS training program (OR, 2.77; 95% CI, 2.55-3.01; OR, 2.01; 95% CI, 1.87-2.16, respectively) when compared to a nonteaching hospital after adjustment for potential confounders.

Hospital Teaching Status	**Nonteaching Hospital** (n = 17,595)	**General Surgery Training Program** (n = 6,868)	**General and Plastic Surgery Training Program** (n = 10,743)
Percent of patients who underwent IBR	14.28%	32.21%	34.31%
Adjusted OR (95% CI)	1.0	2.77 (2.55-3.01)	2.01 (1.87-2.16)
P value	---	(<0.001)	(<0.001)

Conclusions: Hospital teaching status has a significant association with likelihood of IBR. Measures should be taken to ensure that all breast cancer patients are provided the same opportunities for reconstruction, despite the differential access to teaching hospitals. Future studies are needed to investigate the attitudes, practice patterns, and financial pressures on physicians that might explain the differences in hospital IBR rates by teaching status.

0147 Postmastectomy Radiation Therapy Improves Survival for Patients With pT3 or pN2/pN3 Disease

Kathy Yao[1], Ningi Hou[2], David J Winchester[1], Nora Jaskowiak[2], Addie Gorchow[1], David P Winchester[1], Dezheng Huo[2]
[1]NorthShore University Health System, Evanston, IL, USA, [2]University of Chicago, Chicago, IL, USA

Background: NCCN and ASCO guidelines recommend postmastectomy chest wall radiation therapy (PMRT) for patients with pT3 or pN2/pN3 disease. We examined the survival trends and correlates for PMRT utilizing the National Cancer Data Base (NCDB).

Methods: A total of 72,753 invasive breast cancer patients from 1998-2007 were studied. Patients with pT4 tumors, neoadjuvant treatment, and stage IV disease were excluded. Logistic regression models were used to analyze the factors related to PMRT use. Kaplan-Meier method and Cox models were used to examine the impact of PMRT on overall survival.

Results: The percentage of patients undergoing PMRT increased from 50% in 1998 to 62% in 2003, and then decreased to 56% by 2007. This secular trend persisted when adjusting for the covariates as noted below ($p < 0.001$). PMRT utilization was 55% at community cancer centers, 58% at comprehensive community centers, and 55% at academic/teaching centers ($p < 0.001$). PMRT varied significantly by facility location, with the highest rates in the Northeast (68%) and lowest in the West (47%). Using a mixed effect model to account for region, there was a persistent 18% variation in the use of PMRT. Patients 80 years or older were 71% (OR = 0.29; 95% CI, 0.27-0.31) and 70-79 year-olds 46% (OR = 0.54; 95% CI, 0.51-0.58) less likely to undergo PMRT then patients <40 years old. Hispanic and African Americans were 24% and 21% less likely (OR = 0.76; 95% CI, 0.71-0.81 and OR = 0.79; 95% CI, 0.75-0.83, respectively) to undergo PMRT than whites, and Asians 17% (OR = 1.17; 95% CI, 1.06-1.29) more likely to undergo PMRT. Patients with private or managed care insurance were 60% more likely to undergo PMRT than noninsured patients (OR = 1.6; 95% CI, 1.50-1.83), whereas Medicaid patients were 20% (OR = 1.19; 95% CI, 1.08-1.32) more likely to receive PMRT then uninsured. High comorbidity index predicted a lower rate of PMRT. Tumor grade and estrogen receptor status were not significant predictors. In multivariate logistic regression, the aforementioned factors remained significantly associated with PMRT utilization. After adjusting for other prognosis factors in a multivariate analysis, we found patients receiving PMRT had better overall survival than patients who did not receive PMRT: the adjusted hazard ratio for pT3N0 patients was 0.54 (95% CI, 0.45-0.65), for pT3N1 OR 0.64 (95% CI, 0.56-0.73), for pT1/2N2/3 OR 0.73 (95% CI, 0.67-0.79), and for pT3N2/3 OR 0.72 (0.69-0.76).

Conclusion: Overall survival is improved with the use of PMRT in patients with pT3 and pN2/N3 tumors. There is low compliance with ASCO and NCCN guidelines for PMRT and socioeconomic and geographical barriers prevent appropriate delivery of care.

0088 ABO Blood Type/Rh Factor and the Incidence and Outcomes for Patients With Triple-Negative Breast Cancer

Jennifer Yu, Feng Gao, Julie A Margenthaler
Washington University School of Medicine, St. Louis, MO, USA

Objectives: The impact of the inherited markers of ABO blood type and Rh factor on the incidence and outcomes of solid organ and hematologic malignancies is unclear. Previous studies have been inconsistent. Triple-negative breast cancer (TNBC) is a unique subtype of breast cancer with a generally poorer prognosis compared to estrogen receptor positive breast cancer. The factors contributing to this finding have not been fully elucidated. We hypothesized that TNBC may be associated with specific ABO blood type/Rh factor patterns and that these may account for differences in survival outcomes.

Methods: We retrospectively identified 468 patients from our prospectively maintained database who were diagnosed with stage I-III TNBC [estrogen receptor (ER) negative, progesterone receptor (PR) negative, and HER2 nonamplified) between 2001 and 2008. All patients underwent curative surgical therapy at our institution with or without adjuvant systemic and/or radiation therapy. Patient demographics, tumor characteristics, surgical and medical therapies, and outcomes were obtained from the electronic medical record, and the data were examined for associations between these factors and specific ABO blood type/Rh factor. Descriptive statistics and chi-square analysis were utilized for data summary and comparisons. P value <0.05 was considered significant.

Results: Of the 468 patients with TNBC, 283 had known ABO blood type [122 (43%) type O, 108 (38%) type A, 39 (14%) type B, and 14 (5%) type AB] and Rh factor [253 (89%) positive and 30 (11%) negative]. ABO blood type/Rh factor was unknown for 185 (40%) patients. The percentage of each ABO blood

type/Rh factor for our patients with TNBC was not significantly different from that observed in the general population or in a cohort of patients with ER-positive breast cancer ($p>0.05$). For our 468 patients with TNBC, the mean patient age was 53.7 ± 12.5 years with an average follow-up of 30.2 ± 20.5 months. Overall, 234 patients (50%) received adjuvant chemotherapy, 151 (32%) received neoadjuvant chemotherapy, and 83 (18%) received no systemic therapy. Compared to women with blood type O, there was no significant difference in breast cancer-specific mortality for blood type A (HR, 1.106; 95% CI, 0.684-1.788), blood type B (HR, 1.460; 95% CI, 0.766-2.784), or blood type AB (HR, 0.511; 95% CI, 0.122-2.139) after controlling for all potential covariates associated with mortality. Compared to women with a negative Rh factor, there was no significant difference in breast cancer-specific mortality for women with a positive Rh factor (HR, 1.056; 95% CI, 0.527-2.115).

Conclusions: TNBC was not associated with a specific ABO blood type or Rh factor. Further, our results suggest that there is no association between ABO blood type/Rh factor and breast cancer survival in patients with TNBC. The biologic and genetic factors contributing to poorer outcomes for patients with TNBC remain a focus of future research.