

ALND was performed. If the SLN procedure failed or was negative an ALND was not performed.

**Results:** Fourteen French cancer centers took part in this protocol over 2 years (2008–2010). 228 patients were enrolled, including 197 DCIS on VAMB. The SLN was identified in 193 cases (98%) but one case was excluded leaving 192 valid cases for analysis.

Table: Distribution of SLN results and histological lesions found on mastectomy specimens in the series

Initial VAMB result	Mastectomy result	SLN results	N (treatment outcome)
192 DCIS	DCIS – 116	Positive	2 (ALND)
		Negative	114 (no ALND)
	DCIS and micro ID – 20	Positive	4 (ALND)
		Negative	16 (ALND avoided)
	DCIS and ID – 56	Positive	21 (ALND)
		Negative	35 (ALND avoided)

ALND, axillary lymph node dissection; ID, invasive disease; SLN, sentinel lymph node; VAMB, vacuum-assisted macrobiopsy.

ALND was not performed for non-ID and negative SLN (n = 114) and ID or micro-ID and negative SLN (n = 51). This meant that ALND was avoided for 67.1% of the patients with ID (51/76, 95% CI [56.5–77.7]), or 26.6% of patients overall (95% CI [20.3–32.8]), whereas these patients would have previously received ALND without the use of the SLN procedure. We observed 39.6% (76/192) of discordance between VAMB results and definitive results from histology analysis after mastectomy across all patients.

**Conclusions:** SLN is a useful procedure for patients with DCIS diagnosed by VAMB treated by mastectomy and presenting extensive microcalcifications. For patients for whom ID is later identified on the mastectomy specimen, the use of this procedure makes it possible to spare over a quarter of them from ALND and the associated morbidity.

Biological analyses are currently underway to determine predictive factors of invasive disease associated with DCIS.

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#### Is the Accumulation Pattern of Lymphoscintigraphy a Predictive Factor of Positive Sentinel Node?

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**Background:** To accomplish sentinel lymph node (SN) mapping, we routinely perform lymphoscintigraphy (LSG) preoperatively. LSG provides significant information about SN location. However, it is unknown whether the accumulation pattern is a predictive factor of positive SN. Thus, we now investigate the relationship between accumulation pattern and SN positivity.

**Patients and Methods:** One hundred twenty-nine patients were enrolled in this study. Informed consent was obtained from all patients. There was no axillary lymph nodes involvement clinically in all patients. Negative nodes were confirmed by preoperative breast MRI. LSG was performed in all patients 1 hour after subcutaneous injection of a radioactive agent in the areola area. The radioisotope (RI) used was <sup>99m</sup>Tc-labeled tin acid. The average dose of RI administered was 11.1 Mbq. After performing LSG, we checked SN accumulation and classified the accumulation patterns into two types: normal pattern (NP), which was defined as accumulation in only one node in LSG, and variant pattern (VP), which was defined as accumulation in two or more lymph nodes in LSG. After surgery, we compared SN positivity with the accumulation pattern.

**Results:** In the pathologically negative SN group, 72 cases were NP type and 27 cases were VP type. On the other hand, 16 cases were NP type and 14 cases were VP type in the positive SN group (p = 0.00457). These results suggest that lymphatic tract occlusion caused by the cancer cells leads to the generation of collateral pathways to alternative SNs. The data are summarized in the table.

LSG	Pathology	
	SN negative	SN positive
NP	72	16
VP	27	14

p = 0.00457

**Conclusion:** Accumulation in one SN was associated with a significantly lower metastasis rate than accumulation in two or more SNs in LSG. This classification may be a useful predictor for SN metastases. In this conference, we will show further data about the relationship between semi-quantitative measurement of LSG accumulation and SN positivity.

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#### Sentinel Lymph Node Biopsy After Neoadjuvant Chemotherapy for Breast Cancer – We Need to Define the Group of Patients Who Will Benefit

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**Background:** The use of sentinel lymph node biopsy (SLNB) to stage the axilla in patients who have undergone neoadjuvant chemotherapy (NAC) for locally advanced disease is controversial and has yet to be validated, despite growing evidence of its feasibility and accuracy. There are concerns that chemotherapy treatment effects include fibrosis of lymphatics with consequent impediment of tracer flow, and that the potential differential sterilization of sentinel and non sentinel lymph nodes by chemotherapy render the sentinel nodes no longer representative of the pathology of the nodal basin.

We report the detection rate and accuracy of SLNB after NAC for locally advanced breast cancer achieved in a prospective pilot study performed in our institution.

**Methods:** Patients with locally advanced breast cancer who have undergone NAC and have **clinically negative nodes after NAC** were recruited. These patients had SLNB using either blue dye, radio colloid tracer or both, prior to a standard axillary clearance.

**Results:** Between April 2009 and April 2011, sixteen patients with a clinically negative axilla after NAC underwent SLNB prior to axillary lymph node dissection.

Among the patients with no axillary nodal disease prior to NAC, the identification rate and accuracy of SLNB were 100% respectively.

The sentinel node was not identified in four patients. These patients had large tumours, significant nodal disease prior to NAC and had good response to chemotherapy. During surgery, unusual tracer flow patterns were noted in the patients who had mapping with blue dye. Three patients had a falsely negative sentinel node, with overall false negative rate of 42.8%.

**Conclusion:** Neoadjuvant chemotherapy affects lymphatic drainage in the breast and axilla, limiting sentinel node identification and accuracy. This effect is noted in patients with large or multicentric tumours with significant nodal disease prior to NAC and who demonstrate a good response to chemotherapy. Patients with tumours less than 5 cm and no nodal involvement prior to NAC do not seem to be affected. We therefore suggest that before embracing the use of sentinel node biopsy to stage the axilla after NAC, larger studies to define the subsets of patient that may safely benefit are needed.

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#### Systematic Review: Immediate vs Delayed Breast Reconstruction Post-mastectomy

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**Background:** The mainstay of breast cancer treatment remains surgery, with or without adjuvant or neo-adjuvant therapy. In many women, post-mastectomy breast reconstruction is essential to restore body image and improve quality of life. Timing of reconstruction may be immediate or delayed following mastectomy. Outcomes such as psychosocial morbidity, aesthetics and complications rates may differ between the two approaches. The objective of this systematic review was to assess the evidence on the effects of immediate versus delayed reconstruction following surgery for breast cancer.

**Methods:** We searched the Cochrane Breast Cancer Group's Specialised Register, MEDLINE, EMBASE and the WHO International Clinical Trials Registry Platform (ICTRP) on 26 August 2010. From the electronic searches, including the recent updates (August 2010), we retrieved 411 references to studies. We looked for randomised controlled trials (RCTs) comparing immediate breast reconstruction versus delayed or no reconstruction in women of any age and stage of breast cancer. After examination of the 411 titles and abstracts, we eliminated all of those which did not match our inclusion criteria and those which were clearly ineligible from the review. We obtained full text copies of the remaining 9 potentially eligible trials for further evaluation. The review authors discussed the eligibility of these trials and resolved any remaining uncertainties by consensus. Subsequently only 1 study proved to be eligible for inclusion in this review.

**Results:** We included only one RCT that involved 64 women. We judged this study as being at high risk of bias. Post-operative morbidity

and mortality were not addressed, and secondary outcomes of patient cosmetic evaluations and psychosocial well-being post-reconstruction were inadequately reported. Based on limited data there was some, albeit unreliable, evidence that immediate reconstruction compared with delayed or no reconstruction, reduced psychiatric morbidity reported three months post-operatively.

**Conclusions:** The current level of evidence for the effectiveness of immediate versus delayed reconstruction following surgery for breast cancer was based on a single RCT with methodological flaws and a high risk of bias, which does not allow confident decision-making about choice between these surgical options. The ethical problems associated with RCTs in this field are recognised, need to be weighed against the need for methodologically sound, adequately powered trials with a focus on clinical and psychological outcomes: this debate should be re-opened since there is no evidence or consensus on the subject. Given the paucity of RCTs in this field, we are currently carrying an updated review that evaluates study designs other than RCTs, specifically good quality cohort and case-control studies. Further high quality research is needed if decisions in this area are to have a solid evidence base.

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#### Picking Flowers in a Minefield: an Audit of Completion Axillary Node Clearance After Sentinel Node Biopsy

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**Background:** The advent of sentinel node biopsy (SNB) to stage the axilla in breast cancer has reduced the overall rate of axillary node clearances (ANCs) by approximately two-thirds, with the majority of these ANCs being performed as a separate second operation. It has been suggested that performing this technically intricate procedure in non-virgin tissue could significantly affect the overall yield of nodes. Our study aimed to assess the validity of this statement.

**Materials and Methods:** A cohort of 327 consecutive patients undergoing axillary surgery was derived from a combination of hospital admission data, operative theatre lists and cancer registry data from a single Health Board in Wales over a 37-month period from January 2008 to February 2011. Patients were divided into either Primary ANC or Delayed ANC (post-SNB) groups and data collected on number of nodes harvested. Statistical analysis on the data was performed using the Mann-Whitney test.

**Results:** The median number of nodes harvested in primary ANC group was 16 (Range 5-42) and in the delayed ANC group was 15 (Range 4-32). 11.2% of total ANCs had a yield of less than 7 nodes. The vast majority of these were noted to be either coding errors or nodes detected on a pre-planned level 1 clearance. The average nodal harvest between the 2 groups was also comparable (16.77 vs 15.36). The difference between the nodal yields was not statistically significant.

**Conclusions:** Total nodal yields for primary and delayed axillary lymph node dissection were comparable suggesting completion ANC performed as a delayed second operation does not compromise axillary staging.

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#### Atypical Ductal Hyperplasia at Surgical Resection Margins do not Increase the Risk of Recurrence in Invasive Breast Cancer Patients

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**Background:** Resection margin status after breast-conserving surgery (BCS) is the one of the most important factors associated with local recurrence in breast cancer. Atypical ductal hyperplasia (ADH) is known to increase breast cancer risk. We evaluated whether ADH at surgical resection margins would increase ipsilateral breast tumor recurrence (IBTR) after BCS in invasive breast cancer patients.

**Methods:** Data from consecutive 699 patients diagnosed with invasive breast cancer and received BCS between January 2003 and December 2005 were reviewed. Patients received neoadjuvant chemotherapy and metastatic breast cancer patients were excluded. Data including tumor size, nodal status, hormonal receptor, HER2 status and resection margin status were analyzed to identify risk factors of IBTR.

**Results:** During follow up (70.2±21.4 month), IBTR was observed in 13 patients. Tumor size (odds ratio 2.065,  $p=0.216$ ) and nodal status (odds ratio 1.165,  $p=0.803$ ) was not associated with IBTR. Compared with luminal A subtype breast cancer, the risk of IBTR was increased in HER2 subtype with statistical significance (odds ratio 4.320,  $p=0.024$ ). ADH at resection margins did not increase IBTR (odds ratio 0,  $p=0.988$ ), but carcinoma in situ or invasive cancer at resection margins was associated with risk of IBTR (odds ratio 10.994,  $p=0.0001$ ).

**Conclusions:** HER2 subtype and carcinoma in situ or invasive cancer at resection margins were considered as risk factors of IBTR after BCS

in invasive breast cancer patients. Tumor size, nodal status, and ADH at resection margins were not associated with IBTR.

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#### Predictive Factors for Positive Resection Margins After Breast Conserving Surgery

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**Objective:** To identify risk factors of positive resection margins after breast-conserving surgery (BCS) and to develop the scoring system to predict positive resection margins.

**Background:** Positive resection margins are the most important factor associated with local recurrence after BCS in both invasive breast cancer (IBC) and ductal carcinoma in situ (DCIS). It is widely accepted to perform re-excision or re-operation to obtain clear resection margin, but additional excisions resulted in bad cosmesis and increasing medical cost.

**Methods:** Data from consecutive 794 patients diagnosed with IBC or DCIS and scheduled for BCS between January 2003 and December 2005 were reviewed. Patients received neoadjuvant chemotherapy and metastatic breast cancer patients were excluded. Data including pathologic and imaging results were analyzed to identify risk factors of positive resection margins. Scoring system was developed to predict resection margin status and validated with 134 of independent patients.

**Results:** Multivariate analysis showed that grade 4 of mammographic density (OR 1.700,  $p=0.049$ ), the presence of DCIS (OR 4.747,  $p=0.001$ ), size difference between breast MRI and US >0.5 cm (OR 3.239,  $p<0.0001$ ) and non-triple negative breast tumor (OR 5.872,  $p=0.041$ ) were independent predictors of positive resection margins. Based on the results of multivariate analysis, we developed a new scoring system for prediction of positive resection margins. The AUC of scoring system of study population and validation population was 0.733 and 0.689, respectively.

**Conclusions:** Grade 4 of mammographic density, size difference between breast MRI and US >0.5 cm, the presence of DCIS, and non triple-negative breast tumor was independent predictors for positive resection margins. Our new scoring system with 4 factors to predict margin status may aid the surgeon in determine surgical plan and reduce the need for re-excision.

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#### The Additional Value of Blue Dye for Sentinel Lymph Node Detection in Breast Cancer Patients, in Comparison to Lymphoscintigraphy

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**Background:** Sentinel lymph node biopsy (SLNB) is performed for axillary staging of breast cancer patients by blue dye injection, lymphoscintigraphy or by combining both techniques. This study assesses the added value of blue dye for sentinel lymph node (SLN) detection in comparison to lymphoscintigraphy.

**Materials and Methods:** Patients with invasive breast cancer who underwent a SLNB following both lymphoscintigraphy and blue dye injection between January 2007 and August 2010 were included. Sensitivity, specificity, positive and negative predictive value (PPV, NPV) for SLN metastases detection was determined.

**Results:** 256 SLNs were harvested in 151 patients who underwent 153 SLNB procedures. 68 (26%) nodes contained metastases. Lymphoscintigraphy was unsuccessful in 5 procedures (5/153; 3%), of which in 1 case (1/5; 20%) blue dye detected the SLN (table 1).

Table 1. Success rates of the different approaches for performing the sentinel lymph node biopsy (SLNB) procedure

	n	%
<b>Total performed SLNB</b>	153	
Unsuccessful	4	3
Successful with:		
lymphoscintigraphy	148	97
blue dye	98	64
combined	149	97

The added overall value of blue dye was 0.7% (1/153). Blue dye was unsuccessful in 55 procedures (36%), of which lymphoscintigraphy