

- The NPI separates the E Anglia and Cambridge cases into groups with significantly differing survivals.
- There are no significant differences between the three series in case numbers falling into each NPI group nor in survival within groups nor in all case survival.

NPI Group	% lying in Group			% OS at 84 Months $\pm$ 2 SE		
	EA	C	N	EA ( $\pm$ )	C ( $\pm$ )	N ( $\pm$ )
EPG	18	13	15	95 (2)	93 (6)	92 (2)
GPG	25	22	21	94 (2)	94 (4)	90 (2)
MPG I	25	27	28	89 (2)	93 (4)	84 (4)
MPG II	21	24	22	77 (4)	81 (8)	73 (4)
PPG	8	11	10	62 (6)	70 (12)	59 (6)
VPG	2	3	4	48 (12)	52 (26)	37 (12)
All cases				84 (1)	87 (4)	80 (2)

**Conclusion:** Examination of the E Anglia and Cambridge series provides validation of the NPI in prognostic discrimination of cases treated in the 1990's.

#### **O-64 The importance of lymphoscintigraphy in sentinel node biopsy of the breast: a six-year, single-centre experience**

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**Introduction:** The use of Sentinel Lymph Node (SLN) biopsy to stage patients with early breast cancer is becoming routine. This study assesses the contribution of three modalities; lymphoscintigraphy, blue-dye and intra-operative, hand-held gamma probe, in the identification and retrieval of SLN.

**Methods:** All patients with clinically node negative, breast tumours (<30 mm) were considered. Patients were excluded if one or more modalities were not used. Nodes were classified as "hot" (gamma count exceeds background count ten-fold) and/or "blue" (blue node or blue tracking lymphatic).

**Results:** Between 2001 and 2006, 271 patients had SLN biopsy. Every patient (100% success) had at least one SLN removed (mean 1.92 nodes, range 1–6). The median histological tumour size was 15 mm (range 1.4–60 mm) and 55 patients (20.3%) had SLN metastases. Lymphoscintigraphy identified at least one hotspot in 266 (98.2%) patients. If the only the gamma probe was used, a SLN would be retrieved in 268 (98.9%) patients. If blue dye alone was used, SLN identification would be successful in only 237 (87.5%) (87.5%,  $p < 0.0001$ ;  $\chi^2 = 26.107$ ). Of 521 SLN removed, 367 (70.4%) were hot and blue, 129 (24.8%) were hot only and 25 (4.8%) were blue only ( $p < 0.0001$ ) – 56 (15.3%), 12 (9.3%) and 1 (4.0%) respectively had nodal metastases ( $p < 0.0001$ ).

**Conclusion:** The most effective SLN biopsy technique will utilise nuclear medicine scanning, blue dye and intra-operative, hand-held gamma probe. Failure to use the hand-held gamma probe will impact on SLN retrieval rates to a greater extent than omission of blue-dye.

#### **O-65 Simultaneous dual isotope quantification of lymphatic flow to axillary nodes from intradermal and parenchymal tissue planes compared with nodal pathology in breast carcinoma; superiority of parenchymal injection for identification of the sentinel node**

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The identification of the true sentinel lymph node (SLN) may depend on the plane into which the tracer is injected. We used a novel dual isotope approach in breast cancer patients to explore this.

15 patients with early breast cancer undergoing axillary lymph node clearance surgery had simultaneous injections of  $^{99m}\text{Tc}$ -labeled human immunoglobulin-G (HIG) and  $^{111}\text{In}$ -labeled HIG into the parenchymal and intradermal planes. All 228 nodes were dissected fresh and assayed by well-counting for quantification of lymphatic flow from the two planes and by haematoxylin/eosin staining and immuno-histochemistry for metastatic disease.

Flow from the intradermal injection to the nodes was 5 times greater than from the parenchymal plane. The pattern of tracer distribution within the draining nodes divided patients into 3 groups of equal size. In the first, there was near perfect correlation between  $^{111}\text{In}$  and  $^{99m}\text{Tc}$ , whilst in the second and third groups, there was reasonable and poor correlation, respectively.

The parenchymal route was statistically more likely to demonstrate a disease containing node than the intradermal route ( $p < 0.001$  vs 0.49).

Comparison of tracer distribution across the nodal population from the two injection planes allows models of functional anatomy to be developed. It appears that there are two routes of drainage from the parenchymal plane, one joining the intradermal route, the other passing independently to the axilla.

**Conclusion:** There are differences in lymphatic flow patterns from deep and superficial injection sites. Despite the practical advantages of a superficial injection, parenchymal injection is recommended for identification of the true SLN.

#### **O-66 New efficient breast cancer sentinel node biopsy technique for all**

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Sentinel node biopsy as practiced in New Start is cumbersome, time consuming and cannot be performed in many hospitals. The aim was to make this sentinel node biopsy an efficient cost effective technique available to all. The aim was to improve sentinel node efficiency and cost effectiveness.

**Patients and Methods:** The surgeon was the ARSAC licence holder. Radiopharmaceutical was delivered in a unique one use only syringe. 100 patients with invasive breast cancer had 22–28 mBq of  $\text{Tc}^{99m}$  radioactive albumin colloid injected on induction of anaesthesia into the subareolar region followed by injection of 2 mls of patent blue V and 5 mls of saline through the same needle. Sentinel nodes (blue/hot) and palpable axillary nodes were removed only.

**Results:** In 100 patients sentinel nodes were identified in 98. Both blue dye and radioactivity were needed to achieve this. Patients included 13 who had undergone neoadjuvant

endocrine therapy, 3 previous neoadjuvant chemotherapy and 3 patients who had undergone a previous node sample. The average number of sentinel nodes was 2.9 (median 3). The 2 patients without sentinel nodes had a positive axillary sample or a positive intramammary node. There were 18 patients with positive nodes – 17 of whom (94.4%) had a positive SN and one patient had a positive node sample – a single involved node with extra-nodal spread, but a negative SN.

**Conclusion:** This is a more efficient technique. It gives results equivalent to any other technique and can potentially be performed in any hospital following appropriate training.

**O-67 Prediction of axillary lymph node metastasis by size and grade of tumour – an aid for the discussion of axillary surgery in patients with operable breast cancer**

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With the introduction of sentinel lymph node biopsy in the surgical management of breast cancer, it would be helpful to be able to provide an estimated risk for axillary metastatic disease when discussing therapeutic options with patients.

We analysed the risk of metastatic axillary lymph node disease in patients treated surgically for invasive breast cancer by tumour size and grade.

Table 1: The incidence of axillary metastatic disease for invasive ductal carcinoma

Size of Tumour	Grade of Tumour		
	1	2	3
101–200	–	–	1/2 (50%)
51–100	–	10/13 (77%)	17/19 (89%)
21–50	6/21 (29%)	99/233 (42%)	81/133 (60%)
11–20	8/34 (24%)	88/258 (34%)	25/49 (51%)
01–10	4/28 (14%)	9/268 (15%)	4/10 (40%)

Table 2: The incidence of axillary metastatic disease for invasive lobular carcinoma

Size of Tumour	Grade of Tumour		
	1	2	3
101–200	–	2/2 (100%)	–
51–100	–	2/6 (33%)	1/3
21–50	0/2	19/52 (37%)	2/2
11–20	0/6	11/44 (25%)	–
01–10	0/5	1/6 (17%)	–

The risk of lymph node metastasis increases with the size and grade of tumour. All grade 1 and 2 invasive ductal carcinoma <20 mm have <30% risk of having lymph node metastasis whereas all grade 3 tumours >20 mm have a >50% risk. In the presence a single metastatic lymph node, the risk of further diseased nodes in ductal carcinoma of grade 1 is 8%, grade 2 is 24% and grade 3 is 47% and in lobular carcinoma the risk in a grade 1 is 9%, grade 2 is 19% and grade 3 is 60%. These data will aid discussion with patients prior to planning surgery on invasive breast cancer.

**O-68 The incidence of nodal involvement following completion axillary dissection for sentinel node positive disease**

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A retrospective analysis was undertaken examining the incidence of non-sentinel lymph node (NSLN) metastases amongst 486 consecutive patients with clinically node negative breast cancer. All patients had invasive disease of any type/grade with a median tumour diameter of 19 mm. Dual localization methods were used and a sentinel node defined as any node which was hot and/or blue and/or palpably suspicious at operation. Micrometastatic foci were identified on H&E step-sections; immunohistochemistry was not routinely performed. Deposits of ITC's were classified as node negative.

The total number of SLN positive cases was 131 (node positivity rate 27.1%). The mean number of nodes harvested was 2.9 (range 1–10). Two-thirds of node positive cases (89/131) had involvement of a single lymph node and over 40% of these (38/89) contained micrometastases only. The mean number of nodes removed on completion ALND was 15.8. Amongst the SLN positive patients, 35 (28%) had involvement of NSLN, 89 were NSLN negative and 7 did not undergo further axillary surgery due to clinician/patient. When a single SLN was positive for macrometastases, the chance of NSLN involvement was 30% (16/51). When micrometastases only were present in one or more SLN's, the risk of NSLN involvement was almost 17% (7/42 (p=0.15)). All had tumour in a single NSLN and the majority of deposits were >2 mm in size (5 macro-; 2 micro-). When fewer than half of excised nodes (<50%) contained micrometastases only, the chance of further disease on completion ALND was less than when this proportion was ≥ 50% (12% (2/17) versus 20% (5/25) (p=0.68).

Omission of further axillary surgery might be considered appropriate when micrometastatic foci are present in fewer than half the nodes retrieved and potential compound morbidity from sentinel node biopsy followed by delayed ALND minimised.

**O-69 Axillary recurrence in breast cancer patients after a negative sentinel lymph node biopsy**

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Sentinel lymph node (SLN) biopsy is an accepted standard of care for patients with clinically node negative breast cancer. Validation studies have revealed false negative rates of 5–10%, but few studies have reported rates of axillary recurrence in SLN negative patients without completion axillary lymph node dissection (ALND).

A retrospective analysis was undertaken to examine axillary recurrence amongst a group of 311 clinically node negative patients undergoing SLN biopsy for symptomatic and screen-detected breast cancer between January 2004 and December 2006 (median tumour diameter 15 mm). All patients were classified as SLN negative on H&E step-sections but included some patients with deposits of isolated tumour cells (H&E/IHC). To allow at least 3 months follow up, patients treated after December 2006 were excluded, together with those patients who had died without evidence of recurrence (10) and patients with DCIS only on final histology (18). This left 283 patients available for analysis, the majority of whom had received some form of adjuvant systemic therapy (262/283).

At a median follow up of 17 months (range 3–38) there has been only one case of axillary recurrence (1/283). This