

# **SENTINEL LYMPH NODE BIOPSY AND AXILLARY NODE DISSECTION IN EARLY STAGE BREAST CANCER**

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The recommendations contained in this guideline are a consensus of the Alberta Provincial Breast Tumour Team and represent a synthesis of currently accepted approaches to management, derived from a review of relevant scientific literature. Clinicians applying these guidelines should, in consultation with the patient, use independent medical judgment in the context of individual clinical circumstances to direct care.

## BACKGROUND

Axillary lymph node status is an important indicator of prognosis in patients with breast cancer.<sup>1</sup> Knowledge of lymph node status also guides adjuvant therapy decision-making, thereby improving regional and distant control in patients with node-positive disease. Physical examination and/or imaging underestimates the presence of axillary lymph nodal involvement in 20 to 30% of patients with clinically negative axillae.<sup>2</sup> Known risk factors for axillary involvement have some predictive value but are not as reliable at predicting node status as surgery and pathological examination of the tissue. Therefore, the treatment of patients with invasive breast cancer has routinely included axillary lymph node dissection (ALND). ALND however, is associated with significant morbidity, including arm lymphedema, pain, and decreased quality of life<sup>3-5</sup>

Sentinel lymph node biopsy (SLNB) in early stage breast cancer using radioisotope was described by Alex and Krag in 1993,<sup>6</sup> providing an accurate, less invasive method of axillary staging and the ability to identify women with no nodal disease in whom ALND could be avoided. In addition, SLNB has been shown to stage axillary nodes more accurately<sup>7,8</sup> with reduced postoperative and long term morbidity.<sup>9-11</sup> The role of SLNB in treatment of patients with invasive breast cancer has evolved over time, pending results from pivotal clinical trials and studies evaluating special circumstances.

The purpose of this guideline is to establish a standard of care in Alberta for patients with early-stage breast cancer, with respect to the management of the axillary nodes. This guideline will address the indications for sentinel lymph node biopsy, management of patients with a positive finding, and considerations for implementing this procedure in an institution.

## GUIDELINE QUESTIONS

The questions below were based on established guideline frameworks for this topic. In 2005, the American Society of Clinical Oncology developed recommendations for the use of sentinel lymph node biopsy in early-stage breast cancer, which addressed the value of SLNB in practice, appropriate patient selection, technical considerations, and risks and benefits of the procedure.<sup>12</sup> Then in 2009, Cancer Care Ontario (CCO) developed recommendations to address these same issues, plus organizational/ operational considerations and the management of patients with a positive SLNB.<sup>13</sup> The questions below address all of these aspects of SLNB, within the context of Alberta.

1. Should sentinel lymph node biopsy (SLNB) be recommended as standard of care for patients with early-stage breast cancer?
2. What is the role of SLNB in special situations in clinical practice (i.e. large and locally advanced invasive tumours, multicentric tumours, inflammatory breast cancer, ductal carcinoma in situ (DCIS), older age (65 years or more), obesity, male breast cancer, pregnancy, evaluation of the internal mammary nodes, presence of suspicious palpable axillary nodes, prior breast or axillary surgery, and preoperative systemic therapy)?
3. Which patients should undergo axillary lymph node dissection (ALND)? Can ALND be avoided in patients with negative findings on SLNB? Is ALND necessary for all patients with positive findings on SLNB?

4. What are the benefits and risks associated with SLNB? How can risks (i.e. complications and false-negative results) be minimized (e.g. surgeon experience, institution criteria, etc.)?
5. What is the recommended surgeon experience/training and organizational criteria and resources for performing SLNB?
6. How should SLNB be performed (i.e. what are the appropriate mapping technique, operative technique, and histological technique)?

## DEVELOPMENT PANEL

This guideline was reviewed and endorsed by the Alberta Provincial Breast Tumour Team. Members of the Alberta Provincial Breast Tumour Team include breast surgeons, medical oncologists, radiation oncologists, nurses, pathologists, and pharmacists. Evidence was selected and reviewed by a working group comprised of members from the Alberta Provincial Breast Tumour Team and a Knowledge Management Specialist from the Guideline Utilization Resource Unit. A detailed description of the methodology followed during the guideline development process can be found in the [Guideline Utilization Resource Unit Handbook](#).

## SEARCH STRATEGY

The MEDLINE, Cochrane, and CANCERLIT databases, as well as ASCO abstracts and proceedings were searched for literature relevant to these topics. The search included practice guidelines, systematic reviews, meta-analyses, randomized controlled trials, and clinical trials.

Literature published between 1950 and March 2011, comparing sentinel lymph node biopsy with axillary lymph node dissection, was collected using the following search terms: “sentinel lymph node biopsy” AND “lymph node dissection” OR “axillary node dissection” AND “breast cancer.” Literature published between 1950 and March, 2011, pertaining to axillary lymph node dissection in sentinel node positive breast cancer patients, was collected using the following search terms: “lymphadenectomy” OR “sentinel lymph node biopsy” OR “axillary lymph node dissection” and “breast cancer.”

A total of five practice guidelines and seven randomized controlled trials were identified. In addition, several other prospective cohort studies (e.g. non-controlled clinical trials) were also considered as evidence.

Following a review of several existing guidelines on this topic, the Alberta Provincial Breast Tumour Team’s SLNB guideline working group agreed to adapt the Cancer Care Ontario (CCO, 2009) guideline on SLNB in early-stage breast cancer.<sup>12,13</sup> The CCO (2009) recommendations were updated for use in Alberta, following an update of the evidence on this topic, from the MEDLINE and EMBASE databases (May 2008 to March 2011).

## TARGET POPULATION

The target population for this guideline is patients with newly diagnosed, early-stage breast cancer.

## RECOMMENDATIONS

1. **Axillary Staging.** Sentinel lymph node biopsy (SLNB) is recommended for axillary staging of all patients with clinically node negative early-stage breast cancer. Patients with pre-operative biopsy proven nodal metastases should undergo axillary lymph node dissection upfront.

2. **Special Clinical Scenarios.** Described below are three clinical situations: those in which there is a clear role for SLNB, those in which SLNB is not recommended, and those in which the role of SLNB is unclear (see Table 1 also).

- There is sufficient evidence to support the use of SLNB in patients with T1-2 tumours, multicentric tumours, DCIS (with mastectomy), older age, obesity, and bilateral breast cancer. Clinicians and patients should note that older age and/or obesity are risk factors for failed SLN mapping.
- SLNB is not recommended for patients with inflammatory T4 breast cancer, clinically positive nodes, or prior axillary surgery.
  - For clinically suspicious nodes, preoperative needle biopsy (FNA or core) can be performed; patients with a biopsy confirming metastatic disease should proceed directly to ALND.
- The role of SLNB is less clear in the following circumstances: internal mammary lymph nodes, before preoperative systemic therapy, T3 or T4 tumours, DCIS (without mastectomy), suspicious palpable axillary nodes, after preoperative systemic therapy, prior diagnostic or excisional breast surgery, prior non-oncologic breast surgery, and pregnancy. For pregnant patients, there are concerns about the safety of blue dye; decisions should be made on a case by case basis.

**Table 1.** Role of sentinel lymph node biopsy in special clinical scenarios (*Adapted \* from: ASCO, 2005*).<sup>12</sup>

Clinical Circumstance	Guidance	Evidence †
T1 or T2 tumors	Acceptable	Good
T3 or T4 tumors	<i>Acceptable</i>	<i>Limited</i> <sup>14,15</sup>
Multicentric tumors	Acceptable	Limited
Inflammatory breast cancer	Not recommended	Insufficient
Ductal carcinoma in situ with mastectomy	Acceptable	Limited
Ductal carcinoma in situ without mastectomy	Not recommended; unless microinvasion is suspected or proven	<i>Limited</i> <sup>16,17</sup>
Suspicious, palpable axillary nodes	Not recommended	Good
Older age	Acceptable	Limited
Obesity	Acceptable	Limited
Male breast cancer	Acceptable	Limited
Pregnancy	<i>Acceptable</i>	<i>Limited</i> <sup>18,19</sup>
Evaluation of internal mammary lymph nodes	Acceptable	Limited <sup>20,21</sup>
Prior diagnostic or excisional breast biopsy	Acceptable	Limited <sup>22</sup>
Prior axillary surgery	Not recommended	Limited <sup>23</sup>
Prior non-oncologic breast surgery (augmentation, reduction, reconstruction)	Not recommended; unless location of incision allows for non-disruption of lymphatic system	Insufficient
After preoperative systemic therapy	<i>Acceptable</i>	<i>Limited</i> <sup>24-27</sup>
Before preoperative systemic therapy	Acceptable	Limited

\* Modifications to the ASCO (2005) table are italicized; new evidence is cited, where applicable.

† **Good evidence:** multiple studies of SLNB test performance based on findings on completion axillary lymph node dissection  
**Limited evidence:** few studies of SLNB test performance based on findings on completion axillary lymph node dissection. or multiple studies of mapping success without test performance assessed.  
**Insufficient evidence:** no studies of SLNB test performance based on findings on completion axillary lymph node dissection and few if any studies of mapping success.

3. **Role of Additional Surgery.** Described below are the circumstances in which axillary node dissection (ALND) is recommended, circumstances in which ALND *may not* be recommended, and circumstances in which *is not* recommended (see Table 2 also).

- ANLD is recommended in:
  - Patients with positive results from a pre operative needle biopsy of clinically suspicious nodes.
  - All patients with positive findings on SLNB according to routine histopathologic examination
    - Data from a meta-analysis of 1842 patients demonstrates that among patients with a positive SLN, 48.3% were found to have additional node disease on ALND.<sup>12,28</sup>
    - Metastasis is found in nonsentinel nodes in approximately 10% of patients with isolated tumor cells in the SLN and in 20 to 35% of patients with micrometastases in the SLN.<sup>12,29</sup>
    - Patients in whom there was a failed attempt to localize a sentinel node.
- ALND may not be recommended in:
  - Patients with life-shortening co-morbidities.
  - Patients with high perioperative risk.
  - Recent data from the Z0011 trial (2011) supports omission of ALND in a select group of patients with two or fewer positive nodes who are treated with breast conserving surgery (clinical T1-2 N0 M0 treated with whole breast irradiation and adjuvant systemic therapy).<sup>30</sup>
  - A decision to omit ALND should be made on a case by case basis with multidisciplinary input, ideally in a tumour board setting, if available.
- ALND is not recommended: in patients with negative findings on SLNB.

**Table 2.** Role of axillary node dissection in special clinical scenarios.

Clinical Circumstance	Guidance
Positive results from a pre operative needle biopsy of clinically suspicious nodes	Recommended
Positive findings on SLNB according to routine histopathologic examination	Recommended
Failed attempt to localize a sentinel node	Recommended
Life-shortening co-morbidities	May not be recommended
High perioperative risk	May not be recommended
Low risk of residual axillary disease; select patients	May not be recommended
Negative findings on SLNB	Not recommended

4. **Technical Considerations.** Sentinel lymph node mapping and localization has been shown to be highest using the periareolar dual injection technique with radioisotope and vital blue dye. Pathologic evaluation of excised sentinel lymph nodes should be evaluated with cut sections no thicker than 2.0 mm.

- The identification of the SLNs should be guided by hand held gamma probe readings, allowing the surgeon to identify the sentinel node/s with the probe.
  - The 10% rule may be employed to identify SLNs (i.e., all nodes with a count greater than 10% of the hottest count is considered a SLN) as well as visual inspection for blue-stained nodes.
  - Removal of no more than four SLNs has been associated with low false negative rates; minimal additional information is provided from five or more nodes and the risk of additional morbidity is greater.
  - The surgeon should palpate for clinically suspicious nodes which are considered to be SLNs.
- With the use of the radioisotope, it is also possible to demonstrate that radioactive nodes have been removed by performing ex vivo counts on the resected tissue.
- The use of serial sections no thicker than 2.0 mm allows for the recognition of small metastatic deposits that might be missed by the examination of a lymph node that has been bivalved; Hematoxylin & Eosin staining is routinely employed. The use of IHC evaluation should not be used routinely.<sup>30,31</sup>

5. **Risks and Benefits of Sentinel Lymph Node Biopsy.** The following risks and benefits have been associated with the use of sentinel lymph node biopsy (SLNB):

- SLNB is associated with reduced morbidity with equivalent positive node detection rates, compared with ALND, as it is a less invasive surgery (outpatient procedure and no need for drains), has fewer complications (e.g., sensory changes, lymphedema), and has enhanced pathologic staging.
- Possible allergic reactions to blue dye represent a potential harm. Skin necrosis has been associated with methylene blue use.
- Physicians should demonstrate caution regarding false-negative results; success of the procedure (i.e. low false-negative rates) is determined by several quality indicators, including team experience, case volume, and adherence to established protocols in nuclear medicine, pathology, and surgery.

6. **Operational Considerations.** SLNB should be performed by an experienced team to ensure that results are equivalent to those obtained with ALND.

- The proportion of patients successfully mapped correlates with false-negative rates and is a reasonable indicator of quality; consistent pathology and nuclear medicine protocols need to be adhered to.
- The recommended surgeon training includes completion of at least one of the following:
  - training during a residency or fellowship program
  - mentorship with an experienced surgeon (may include a formal didactic course)
  - combining the procedure with a number of completion dissections to demonstrate acceptable accuracy (may include a formal didactic course)
- The minimum system recommendations are that clinicians and patients should have access to:
  - a licensed nuclear medicine facility that follows a defined SLNB protocol to perform injection by nuclear medicine personnel or the surgeon
  - a surgeon with appropriate training and experience in sentinel node detection and extraction and access to a hand-held gamma probe, which is used to detect the SLN
  - a pathologist who assesses the SLN specimens according to a standardized protocol

## DISCUSSION

### Indications for sentinel lymph node biopsy

**Axillary staging.** Four randomized controlled trials have reported high sentinel lymph node (SLN) detection rates (95 to 97%)<sup>31-33</sup> and accuracy rates (94 to 98%)<sup>34</sup> with low false-negative rates (9.5%),<sup>31</sup> especially with training and the use of blue dye in addition to radioisotope (6.7%).<sup>34</sup> The most controversial of reasons to continue axillary dissection is whether it has a survival benefit. Among patients who underwent sentinel lymph node biopsy (SLNB) and axillary lymph node dissection (ALND) versus those who underwent SLNB alone, disease-free and overall survival rates were similar (95.0-95.5% vs. 94.8-96.4% and 88.6-89.9 vs. 87.6-89.0%, respectively).<sup>31-33</sup> Orr (1999) conducted a systematic review of all trials in which patients were randomized to either standard treatment in the axillae versus no axillary treatment.<sup>35</sup> Each individual trial showed a non-significant survival improvement favoring ALND. When trial results were combined there was a statistically significant, 5%, overall survival advantage with ALND. However, the generalizability of these results to the present has been questioned because the trials were carried out many years ago and included predominantly node-positive patients with large (palpable) primary tumours and without modern systemic therapies.<sup>36</sup> Overall, several national guidelines support the use of SLNB as a preferred

method of axillary staging or standard of care in patients with node-negative, early-stage breast cancer.<sup>13,37-39</sup>

**Special clinical scenarios.** The use of SLNB in patients with T1 or T2 tumours, multicentric tumours, DCIS (with mastectomy), older age, obesity, and bilateral breast cancer is supported by the CCO, 2009 guideline<sup>13</sup> and the National Comprehensive Cancer Network (NCCN), 2010 guideline.<sup>37</sup> The recommendation against performing routine SLNB in patients with inflammatory T4 breast cancer or those with prior axillary surgery, was based on the CCO, 2009 guideline and the exclusion criteria of several RCTs.<sup>31-34,40-42</sup> It should be noted, however, that patients with a minor previous axillary surgery could be considered for SLNB on an individual basis.<sup>13</sup> As data are limited, the role of SLNB is unclear in the following circumstances: internal mammary lymph nodes, before preoperative therapy, T3 or T4 tumours, DCIS (without mastectomy), suspicious palpable axillary nodes, after preoperative systemic therapy, prior diagnostic or excisional breast surgery, prior non-oncologic breast surgery, and pregnancy.<sup>13</sup>

For patients with prior non-oncologic surgery, limited data exists due to exclusion of such patients from large series. Case by case evaluation is required to determine if disruption of the lymphatics may be expected, based on prior incisions and on the duration of time since the non-oncologic surgery. Routine use of pre-operative lymphoscintigraphy may be of benefit in this population to confirm that mapping is successful.

For patients with DCIS having breast conserving surgery, use of sentinel lymph node biopsy should not be performed routinely.<sup>12</sup> Performance of SLNB should be determined on a case by case basis with consideration given to the likelihood of occult invasive disease based on characteristics of the DCIS (e.g., size >5 cm, discordant radiology suggestive of invasion, palpable lesion, possible microinvasion on core biopsy, etc.) and the possibility of performing an accurate SLNB after breast conserving surgery.

For pregnant patients, there exist concerns about the safety of blue dye. Several RCTs excluded pregnant patients.<sup>14,32-34</sup> However, radiation exposure to the fetus using non-iodine radioisotopes in the dosages used for the sentinel node technique appear to be minimal.<sup>18,19</sup> The CCO (2009) guideline states that most members of their Expert Panel *would use the SLNB technique in a pregnant woman beyond the 1<sup>st</sup> trimester, weighing risk versus benefit on a case-by-case basis.*<sup>13</sup>

For patients with clinically positive nodes, SLNB is contraindicated, as it has been suggested that the path of the dye or the radio-colloid agent may be blocked from tumour cells infiltrating the lymph vessels, which could prevent the identification of the true sentinel node(s) and result in failure of the procedure or false negative results.<sup>43</sup> In these cases, a preoperative needle biopsy can be performed, followed by an ALND in those with confirmed metastatic disease.

### Management of patients following sentinel lymph node biopsy

**Role of additional surgery for patients with a positive SLN.** The current standard of practice is to perform ALND following a positive SLNB.<sup>12,13,37-39</sup> A recent study by Guiliiano, et al. 2011<sup>30</sup> (ACOSOG Z0011 trial) suggests that ALND may not be necessary in a select group of sentinel lymph node (SLN) positive patients. The data showed that among 891 SLN positive patients undergoing breast conserving surgery, tangential whole breast radiotherapy and systemic chemotherapy with or without hormonal therapy, who were randomized to either SLNB alone or SLNB plus ALND, the regional and axillary recurrence rates were found to be 0.5 and 0.9%, respectively. Furthermore, five-year in-breast recurrence

and disease-free survival rates were not significantly different (2.1 vs. 3.7%, respectively,  $p=0.16$ ; and 83.8 vs. 82.2%, respectively,  $p=0.13$ ) after a median follow-up of 74.4 months.

Retrospective studies among patients who received false-negative SLNB results, and therefore did not undergo ALND, have largely shown no differences in recurrence or survival rates.<sup>44-47</sup> However, given that the strength of evidence from retrospective studies is low by nature, caution is warranted in the interpretation of these results. Furthermore, the MIRROR study<sup>41</sup> showed that, among node-positive patients with isolated tumour cells (ITC) or micrometastases, the adjusted risk for disease events was 43% lower (95% confidence interval, 0.45 to 0.73) for those who received systemic adjuvant therapy ( $n=856$ ) versus those who did not ( $n=995$ ), with a median follow-up of 5.1 years. Until data from more randomized controlled trials becomes available, the evidence for changing current practice in favor of omitting ALND routinely, following a positive SLNB, is not sufficient.<sup>12,13</sup> One RCT evaluating a highly selected cohort of low risk but node positive patients (age >50, no LVI, T1 & T2 tumours) treated with SLNB alone, BCS, whole breast radiotherapy and systemic therapy found no difference in axillary recurrence or overall survival at 6.3 years follow up.

**Role of additional surgery for patients with a negative SLN.** Axillary lymph node dissection is not recommended in patients with negative findings on SLNB. This is supported by several clinical practice guidelines,<sup>12,13,21,23</sup> based on the results of several RCTs among clinically node negative patients that showed no survival (overall or recurrence-free) differences among patients who underwent SLNB alone and those who underwent SLNB plus ALND.<sup>31-33,48,49</sup>

### Technical and practical considerations for sentinel lymph node biopsy

**Benefits and risks of sentinel lymph node biopsy.** The major attraction of SLNB over ALND for axillary assessment is that it has less morbidity in terms of patient discomfort and lymphedema.<sup>14,50-62</sup> Data from randomized trials have confirmed that patients treated with SLNB alone had significantly less arm and axillary pain, improved range of motion, less lymphedema, less numbness, fewer complications, and better short term quality of life than those treated with ALND.<sup>14,31-35,54,62,63</sup> Furthermore, SLNB allows the nodes to be examined more closely, thereby accurately predicting the status of the axilla by identifying the first lymph node(s) receiving lymphatic drainage from the breast tumor. Today it is widely used as a single staging method.<sup>64</sup> The major concern with SLNB is that it can underestimate the presence of nodal metastases and thus lead to incorrect prognostic information, suboptimal treatment, and potentially a survival disadvantage. However, false-negative rates associated with SLNB have been declining and are now reported at between 3 to 14%.<sup>54,65</sup>

In a general breast cancer population with clinically negative axilla, the node positive rate is 30%; thus, given a SLNB false negative rate of 10%, about 3 per 100 women will be misinformed that they have negative axillary nodes,<sup>56</sup> which may be similar to false negative rates of formal axillary node dissections. Recent studies have demonstrated that, at follow-up periods of up to eight years, overall survival and disease-free survival are high (90.3 to 94.8% overall survival and 81.5 to 87.6% disease-free survival)<sup>30-32</sup> for SLNB and not significantly different than ALND.<sup>30-32,48</sup> Physicians should demonstrate caution regarding false-negative results; as discussed in greater detail below, low false-negative rates are better achieved when the team is experienced in the SLNB procedure.

**Technical considerations.** Sentinel lymph node detection rates are negatively impacted by minimal surgeon training.<sup>13,66-68</sup> Surgeon experience is mentioned as a quality indicator in several guidelines including CCO (2009),<sup>13</sup> NCCN (2010)<sup>37</sup> and NICE (2009).<sup>39</sup> The ASCO (2005) guideline,<sup>12</sup> on which the

CCO (2009) guideline was based, recommends that surgeons take a formal course on the technique, with didactic and hands-on training components; have an experienced mentor; keep track of individual results, including the proportion of successful mappings, false-negative rates, and complication rates; and maintain follow-up on all patients over time. Other factors that have been shown to negatively impact the success of SLNB include high body mass index<sup>34,67</sup> and multicentric tumours (versus unifocal).<sup>34,69</sup> Factors for which evidence was unclear included tumour location, tumour grade/size, number of sentinel nodes harvested, and non-visualization of sentinel nodes on pre-operative lymphoscintigraphy.

The removal of more than one node is associated with a lower false-negative rate among patients with biopsy-proven clinical stage T1-2, N0 breast cancers;<sup>70</sup> however, the removal of more than four nodes is not recommended. Martin, et al. (2001) demonstrated, among a cohort of 94 patients with the hottest SLN benign, that the false-negative rate drops to 8% at the fourth or greater SLN site.<sup>71</sup> Yet, among a cohort of 1358 patients, the false-negative rate did not improve significantly with the removal of additional nodes (i.e. 9.4% for four nodes, 8.8% for five nodes, and 7.7% for more than five nodes).<sup>72</sup> Given the potential morbidity associated with the removal of additional nodes and lack of additional benefit, the removal of more than four nodes is not cost-effective and cannot be recommended.

The dual injection (radiocolloid and blue dye) technique was endorsed in several guidelines, including CCO (2009)<sup>13</sup> NICE (2009)<sup>39</sup> and ASCO (2005)<sup>12</sup> based on its use in some RCT protocols.<sup>15,48,73</sup> Other RCTs allowed use of either radiocolloid or dye or both.<sup>30,31,33,34</sup> Operative technique varied slightly among RCTs; pathologic evaluation included the use of serial sectioning of specimens, but varied in terms of intervals between sections, number of levels sectioned, and thickness of sections. The CCO (2009) guideline recommends that excised sentinel lymph nodes are sectioned no thicker than 2 mm parallel to the longest meridian, to allow for the recognition of small metastatic deposits that might be missed by the examination of a lymph node that has been bivalved.<sup>13</sup> Hematoxylin and Eosin is routinely used to examine tissue sections for SLN micrometastases; however, a role for immunohistochemistry staining in this setting has not been established.<sup>30,31</sup>

**Operational considerations.** SLNB should be performed by an experienced, multidisciplinary team to ensure results (e.g. false negative rates) are equivalent to those obtained with ALND.<sup>13,74,75</sup> As outlined in the CCO (2009) guideline, clinicians and patients should have access, at minimum, to a licensed nuclear medicine facility that follows a defined SLNB protocol to perform the injection, a surgeon with appropriate training and experience in sentinel node detection and extraction; access to a hand-held gamma probe, which is used to detect the SLN, and a pathologist who assesses the SLN specimens according to a standardized protocol.<sup>13</sup> These institutional requirements were addressed only by the CCO (2009) guideline and are relevant in the Alberta environment. However, several guidelines described a multidisciplinary team, which should consist of a surgeon, a nuclear physician (where nuclear medicine facilities are available), a pathologist, an anesthetist, and specialist nurses.<sup>12,13,75</sup>

## GLOSSARY OF ABBREVIATIONS

Acronym	Description
ALND	axillary lymph node dissection
ASCO	American Society of Clinical Oncology
CCO	Cancer Care Ontario
DCIS	ductal carcinoma in situ
FNA	fine needle aspiration
ITC	isolated tumour cells
NCCN	National Comprehensive Cancer Network
QOL	quality of life
RCT	randomized controlled trial
RT	radiotherapy
SLN	sentinel lymph node
SLNB	sentinel lymph node biopsy

## DISSEMINATION

- Present the guideline at the local and provincial tumour team meetings and weekly rounds.
- Post the guideline on the Alberta Health Services website.
- Send an electronic notification of the new guideline to all members of Alberta Health Services, Cancer Care.

## MAINTENANCE

A formal review of the guideline will be conducted at the Annual Provincial Meeting in 2013. If critical new evidence is brought forward before that time, however, the guideline working group members will revise and update the document accordingly.

## CONFLICT OF INTEREST

Participation of members of the Alberta Provincial Breast Tumour Team and the Alberta Gynecologic Oncology Team in the development of this guideline has been voluntary and the authors have not been remunerated for their contributions. There was no direct industry involvement in the development or dissemination of this guideline. Alberta Health Services, Cancer Care recognizes that although industry support of research, education and other areas is necessary in order to advance patient care, such support may lead to potential conflicts of interest. Some members of the Alberta Provincial Breast Tumour Team and Alberta Gynecologic Oncology Team are involved in research funded by industry or have other such potential conflicts of interest. However the developers of this guideline are satisfied it was developed in an unbiased manner.

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