

# Criteria for Extent of Surgery in Differentiated Thyroid Cancer: Lobectomy and Completion Thyroidectomy



**Table 1: Preoperative Criteria: Lobectomy vs. Total Thyroidectomy**

	Lobectomy Preferred (must meet all the following criteria)	Total Thyroidectomy Preferred
<b>Clinical features</b>	No clinical risk factors for high-risk disease (e.g. rapidly enlarging neck mass, hard/fixed mass, signs/symptoms suggestion of local invasion)	Family history of thyroid cancer (Criteria: 3+ first degree relatives with PTC, or MEN syndrome) History of head/neck radiation exposure
<b>Molecular (if known)</b>	BRAF V600E alone N/K/HRAS alone RET fusion alone NTRK1 or NTRK3 fusion alone	TERT promoter mutation (alone or with any other mutation) BRAF V600E + TP53 BRAF V600E + AKT1
<b>Contralateral lobe</b>	Contralateral lobe contains: No nodules Low suspicion (TR1-2) nodule TR3-5 nodule with benign FNA <sup>a</sup> FNA benign nodule (TR3-5 and >1 cm)	Contralateral lobe contains: High suspicion (TR5) nodule on neck ultrasound FNA Bethesda 1 (nondiagnostic) <sup>*,b</sup> FNA Bethesda 3 or 4 (AUS/FLUS or FN/SFN) nodule FNA Bethesda 5 or 6 (SM or malignant) nodule
<b>T stage</b>	cT1 (≤2 cm): Strong recommendation for lobectomy. cT2 (>2–4 cm): Lobectomy (preferred) or TT is acceptable for unilateral, low-risk disease.	Unilateral, multifocal disease* T3a (primary tumour size >4 cm)* T3b-T4b (suspected gross invasion into any surrounding structures based on preop physical exam or imaging findings)
<b>N stage</b>	cN0	N1 Indeterminate lymph nodes on neck US or FNA*
<b>M stage</b>	cM0	M1
<b>Other factors</b>	Patient preference	Patient preference Graves disease or hyperfunctioning nodules in either lobe

\*Weak recommendation; clinical context should be applied

<sup>a</sup>For contralateral lobe nodules, we recommend to aid in decision between lobectomy and TT: TR3 – FNA if > 1.5 cm, TR4-5 – FNA if > 1 cm

<sup>b</sup>If this is the first nondiagnostic cytology, FNA should be repeated to try to obtain a diagnosis prior to deciding on extent of surgery.

**Table 2:** Postoperative Criteria: Lobectomy Alone vs. Completion Thyroidectomy

	Lobectomy Alone Preferred	Completion Thyroidectomy Preferred
<b>Contralateral lobe</b>	Contralateral lobe contains: No nodules Low suspicion (TR1-2) nodule FNA benign nodule (if TR3-5 and >1 cm)	In the setting of a diagnostic lobectomy that confirmed cancer, contralateral lobe contains: High suspicion (TR5) nodule (recommend biopsy) FNA Bethesda 3 / 4 (indeterminate) nodule* FNA Bethesda 5 or 6 nodule
<b>T stage</b>	T1-3a (intrathyroidal tumour of any size) Multifocal disease* in index lobe with no or low-risk contralateral lobe nodules	T3b-T4b (confirmed gross invasion into any surrounding neck structures based on intraoperative evaluation and surgical pathology)
<b>N stage<sup>a</sup></b>	pN0 ≤ 5 LN positive and all ≤ 0.5 cm, without extranodal extension*	cN1 1-4 LN positive, max LN size 0.6-0.9 cm* > 5 LN positive, of any size Any # of LN positive, max LN size ≥ 1 cm Any # of LN positive with extranodal extension
<b>M stage</b>	cM0	M1
<b>Histology</b>	NIFTP or tumour of uncertain malignant potential Tall cell features (<30% tall cells)	High grade tumour: Differentiated high grade carcinoma Poorly differentiated thyroid cancer Aggressive PTC histology: Tall cell subtype (≥30% tall cells), Hobnail, Diffuse sclerosing, Columnar
<b>Vascular invasion</b>	No vascular invasion present	PTC with vascular invasion (any number of foci)* FTC or OTC: ≥2 foci vascular invasion
<b>Other</b>	Patient preference	2+ ATA low-intermediate risk factors Patient preference

\*Weak recommendation; clinical context should be applied.

<sup>a</sup>Lymph node metastases found incidentally post-lobectomy do not automatically warrant completion thyroidectomy. The decision for completion thyroidectomy should factor in the number, size, LN ratio (>0.3 = higher risk), and extranodal extension status of lymph node metastases.

**Table 3:** Perioperative Best Practices: Lobectomy and Completion Thyroidectomy

Lobectomy & Completion Thyroidectomy Recommended Best Practices	
<b>Preoperative assessment</b>	<ul style="list-style-type: none"> <li>• Neck ultrasounds should be high quality and recent (preferably within 6 months of OR date); surgeon directed bedside ultrasound is an acceptable alternative to repeat formal neck ultrasound</li> <li>• If pursuing lobectomy, perform biopsy of contralateral lobe nodules according to Table 1 criteria above</li> <li>• Counsel all patients on the possibility of intraoperative conversion to total thyroidectomy or need for subsequent completion thyroidectomy if higher-risk factors emerge intraoperatively or postoperatively, respectively</li> </ul>
<b>Intraoperative assessment</b>	<ul style="list-style-type: none"> <li>• Employ frozen section when appropriate to assess LN or other factors that would prompt conversion to completion thyroidectomy</li> <li>• Operative report should clearly describe whether extrathyroidal extension is suspected, and if present, completeness of resection</li> </ul>
<b>Postoperative assessment</b>	<ul style="list-style-type: none"> <li>• We recommend obtaining a formal pathology review by an expert thyroid pathologist if the surgical pathology report is missing any key elements listed in the tables above, which are necessary to appropriately risk stratify the patient and decide on surgical management</li> <li>• If considering completion thyroidectomy to facilitate RAI for a borderline case, talk to your endocrinology team first to ensure this is appropriate</li> <li>• If completion thyroidectomy is required due to discovery of "high risk" features, it should be performed as early as safely possible (~ 3 months from initial surgery) to facilitate timely adjuvant RAI</li> </ul>