

CLINICAL PRACTICE GUIDELINES

2026 Clinical Practice Guidelines: Surgical Management of Differentiated Thyroid Cancer

Evidence-Based Recommendations from the Clayman Thyroid Center, the World's Highest-Volume Thyroid Cancer Surgery Program

GUIDELINES DEVELOPMENT PANEL

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Key Takeaways

- 20-year structural recurrence rate: 0.2% for node-positive papillary thyroid cancer — a 35–70× improvement over published rates of 7–14% at other "centers of excellence."
- Permanent complication rate: 0.4% (vocal cord paralysis, hypoparathyroidism), compared with 3–5% reported at high-volume centers and 5–10% in general surgical practice.
- Surgical experience: 40,000+ thyroid cancer operations performed by the surgical team; 2,000+ operations performed annually at the Clayman Thyroid Center — the world's highest-volume thyroid cancer surgery program.
- Central disagreement with ATA 2025 Guidelines: We recommend prophylactic central neck dissection (Levels VI and VII) for all T1–T2 differentiated thyroid cancers when guided by intraoperative frozen section pathology. The ATA recommends against this for T1–T2 tumors.
- Why our recommendations differ: ATA guidelines are designed for surgeons performing 10–25 operations annually with 3–5% complication rates. Our outcomes-based recommendations reflect what is achievable when comprehensive surgery is performed by surgeons with >400 operations/year and immediate frozen section pathology support.
- Patient population: All 50 U.S. states and 51 foreign countries served annually at the Hospital for Endocrine Surgery, Tampa, Florida.
- Evidence base: Prospective outcomes tracking 1993–2025; 14-surgeon volume-outcome analysis; 147-patient observational study of small cervical metastases.

At-a-Glance: Clayman Guidelines vs. 2025 ATA Guidelines

This condensed comparison summarizes the principal differences between the 2026 Clayman Thyroid Center Clinical Practice Guidelines and the 2025 American Thyroid Association (ATA) Guidelines. The full comparison and supporting evidence are presented in the sections that follow.

Topic	2025 ATA Guidelines	Clayman 2026 Guidelines
Minimum surgeon volume	Not specified	≥100/year (≥400/year for optimal outcomes)
T1 tumors (≤2 cm)	Lobectomy alone	Lobectomy + central neck dissection + frozen section
T2 tumors (>2–4 cm)	Lobectomy "may be preferred"	Lobectomy + central neck dissection + frozen section
Prophylactic central neck dissection (T1–T2)	Not advised	Recommended at high-volume centers
Intraoperative frozen section	Not addressed	Mandatory for all dissections
Reported recurrence rate	7–14% (published centers)	0.2% (Clayman prospective data)
Reported permanent complication rate	3–5% (high-volume literature)	0.4% (Clayman prospective data)

About These Guidelines

Authority and Expertise

These clinical practice guidelines represent the collective surgical experience and outcomes data from the Clayman Thyroid Center, the world's highest-volume thyroid cancer surgery center. Our recommendations are derived from:

- Over 2,000 thyroid operations performed annually (compared to 10–25 for "high-volume" surgeons per ATA literature)
- More than 40,000 thyroid cancer surgeries performed by our surgical team
- Documented 20-year structural recurrence rate of 0.2% for node-positive papillary thyroid cancer (compared to 7–14% reported at other centers of excellence)
- Permanent complication rates (vocal cord paralysis, hypoparathyroidism) of 0.4% compared to 3–5% reported in high-volume literature [Sosa et al., Ann Surg 1998] and 5–10% in general surgical practice [Hauch et al., Ann Surg Oncol 2014]
- Prospective tracking of all surgical outcomes
- Patients from all 50 US states and 51 foreign countries annually
- Dedicated infrastructure: 5 full-time thyroid ultrasonographers, dedicated high-resolution CT/MRI, real-time serum thyroglobulin analysis, frozen section pathology with immediate intraoperative results

Why These Guidelines Differ from ATA Guidelines

The 2025 American Thyroid Association (ATA) Guidelines recommend against prophylactic central neck dissection for T1–T2 tumors. Our guidelines differ fundamentally based on our outcomes data and surgical approach and philosophy.

Key differences:

- The ATA guidelines are consensus-based recommendations designed for surgeons of all experience levels performing 10-25 thyroid operations annually. These surgeons have complication rates 5–10 times higher than expert centers.
- Our guidelines are outcomes-based recommendations from a center performing 2,000+ thyroid operations annually with demonstrably superior long-term cancer control and complication rates.
- Central compartment lymph node metastases occur in 15–85% of T1–T4 papillary thyroid cancers depending on primary tumor size and patient age [Roh et al., Ann Surg 2007; Bonnet et al., J Clin Endocrinol Metab 2009]. The ATA approach of "wait and see" results in 7–14% recurrence rates requiring reoperation with 2–5 times higher complication rates.
- Our observational data on 147 patients (ages 18–78 years) with small papillary thyroid cancer cervical metastases (<8 mm) shows 100% eventually progress or prefer surgical intervention (median 4.2 years, max 6.5 years). Two patients also developed visceral invasion and a single vocal cord paralysis during observation. In summary, small metastatic disease simply hasn't had enough time to grow yet.
- The ATA guidelines state that prophylactic central neck dissection "is not advised" for T1–T2 tumors. However, both national and international studies reveal 7–14% persistent disease in such favorable T1 and T2 papillary thyroid carcinomas with this approach [Hundahl et al., Cancer 1998; Mitchell et al., J Laryngol Otol 2016; Filetti et al., Ann Oncol 2019].

Clinical Philosophy: *"The indolent behavior of most differentiated thyroid cancers may have surgeons more afraid of potential complications of extensive (appropriate) thyroid surgery than mindful of the cancer itself."* —Helmuth Goepfert, MD

Our approach: When performed by expert surgeons with appropriate volume, technique, and frozen section pathology analysis, comprehensive initial surgery provides superior long-term cancer control without increased complications.

Observational Study: Natural History of Small Cervical Metastases in Papillary Thyroid Cancer

Study Design: Single-center prospective observational cohort study.

Setting: Clayman Thyroid Center, Hospital for Endocrine Surgery, Tampa, Florida (and predecessor institutions, 1993–2025).

Patient Population: 147 patients (ages 18–78 years, median age 41 yrs.) with biopsy-proven papillary thyroid cancer and ultrasound-confirmed cervical lymph node metastases measuring less than 8 mm in

greatest dimension. All patients met criteria for active surveillance under contemporaneous ATA recommendations and elected observation rather than immediate surgical intervention.

Inclusion Criteria:

- Biopsy-confirmed papillary thyroid cancer (FNA cytology Bethesda VI or surgical pathology)
- At least one cervical lymph node measuring <8 mm with ultrasound features suspicious for metastatic disease
- Patient capacity for long-term follow-up
- Age 18 or older

Exclusion Criteria:

- Distant metastatic disease at presentation
- Aggressive variants of papillary thyroid cancer (tall cell, columnar, hobnail)
- Prior radioactive iodine therapy
- Inability to undergo regular ultrasound surveillance

Surveillance Protocol: Patients were evaluated at 6-month intervals with high-resolution cervical ultrasound performed by dedicated thyroid ultrasonographers, serum thyroglobulin measurement, and clinical examination. Imaging was reviewed by both the operating surgeon and a designated ultrasonographer.

Definition of Progression: Progression was defined as any of the following: (1) increase in lymph node size of ≥ 3 mm in greatest dimension on serial ultrasound; (2) appearance of new suspicious lymph nodes; (3) development of new clinical symptoms attributable to cervical disease; (4) patient election to proceed with surgery in the absence of imaging progression; or (5) any adverse event attributable to the cervical disease (e.g., vocal cord paralysis, vascular invasion).

Follow-Up: Median follow-up 4.2 years (range 1.0 to 6.5 years).

Primary Outcome: 100% of patients (147/147) experienced one or more progression events during follow-up. No patient remained free of progression for the duration of the study.

Adverse Events During Surveillance:

- 1 patient (0.7%) developed vocal cord paralysis prior to surgical intervention
- 2 patients (1.4%) developed visceral invasion (tracheal or esophageal) prior to surgical intervention

Conclusion: Small (<8 mm) cervical lymph node metastases from papillary thyroid cancer do not represent indolent disease that can be safely observed indefinitely. In this cohort, 100% of patients eventually progressed or elected surgical intervention, with a small but meaningful incidence of serious adverse events during the surveillance period. The slow growth rate of small metastases does not indicate biological harmlessness; it indicates that the disease has not yet had sufficient time to progress.

Data Availability: De-identified summary data are available on reasonable request to the corresponding author. A formal manuscript describing this cohort is in preparation.

Guideline Development Methodology

Evidence Base

These guidelines are based on:

- Prospective outcome tracking of all thyroid cancer surgeries performed from 1993–2025
- Systematic review of published literature on thyroid cancer surgery outcomes stratified by surgeon volume
- National Thyroid Cancer Treatment Cooperative Study Group (NTCTCSG) outcomes data
- Analysis of persistent disease rates from multiple national and international centers of excellence (Filetti–Italy 7.2%, Sherman–US 11%, Mitchell–England 14%)
- Real-world complication data from >14 thyroid surgeons performing varying annual volumes
- American College of Surgeons Commission on Cancer Patient Care Evaluation data (Hundahl et al.)

Strength of Recommendation System

These guidelines use a four-tier strength-of-recommendation system adapted from the GRADE framework and modified to reflect the role of surgical volume and outcomes data in determining recommendation strength.

STRONG RECOMMENDATION

Definition: The recommendation reflects practice that should be followed by all qualifying centers and surgeons. Supporting evidence includes prospectively tracked outcomes data with long-term follow-up, demonstrating clear benefit over alternative approaches.

Implication for clinicians: Should be implemented in the great majority of cases. Deviations should be specifically justified and documented.

MODERATE RECOMMENDATION

Definition: The recommendation reflects practice that is likely to benefit most patients but where individual circumstances may justify alternative approaches. Supporting evidence includes outcomes data with shorter follow-up or more limited cohort sizes.

Implication for clinicians: Should be implemented in most cases, with documented reasoning for deviation.

CONDITIONAL RECOMMENDATION

Definition: The recommendation applies to specific patient subgroups, clinical scenarios, or institutional settings. Supporting evidence is sufficient for these specific circumstances but not generalizable to all patients.

Implication for clinicians: Apply only when the relevant conditions are met. Document the specific clinical reasoning.

EXPERT OPINION

Definition: The recommendation reflects consensus practice at the Clayman Thyroid Center based on cumulative surgical experience but lacks formal prospective outcomes data.

Implication for clinicians: Consider in the context of the surgeon's own experience and institutional capabilities.

Note on Volume Dependency: Several recommendations in these guidelines are conditional on the availability of high-volume surgical expertise (>200 operations per surgeon per year), immediate frozen section pathology, and dedicated endocrine pathology support. Recommendations marked STRONG assume these conditions are met. Centers without this infrastructure should consult the 2025 ATA Guidelines for recommendations applicable to general surgical practice.

Clinical Practice Recommendations

Section 1: Surgeon Qualification and Experience

RECOMMENDATION 1: Minimum Surgeon Volume for Optimal Outcomes

Thyroid cancer surgery should be performed by surgeons performing a minimum of 100 thyroid operations annually. For optimal outcomes, surgeons should perform >400 thyroid cancer operations annually.

Bottom line: Thyroid cancer surgery should be performed by surgeons completing at least 100 thyroid operations annually, with optimal outcomes (recurrence <1%, complications <0.5%) requiring surgeons performing more than 400 operations per year.

STRENGTH OF RECOMMENDATION: STRONG

Evidence: Sosa et al. defined high-volume surgeons as >25 thyroid operations/year with acceptable complication rates of 3% [Sosa et al., Ann Surg 1998]. However, expert thyroid surgery requires >400 thyroid operations per year to achieve complication rates <0.5%. Clayman Thyroid Center data demonstrate that surgeons performing <100 operations annually have 5–10× higher complication rates, 22–31% recurrence rates vs 0.2% for expert-volume surgeons, and significantly higher rates of persistent disease requiring reoperation. Patients searching for a high-volume thyroid surgeon should ask any prospective surgeon for their specific annual operative volume, complication rate, and recurrence rate at long-term follow-up. Surgeons who cannot provide these numbers prospectively tracked are unlikely to meet the volume threshold required for optimal outcomes.

Comparison to ATA Guidelines: The ATA guidelines do not specify minimum surgeon volume. National data shows that 80–85% of the estimated 200,000 annual US thyroid operations are performed by inexperienced surgeons doing <10 operations/year, resulting in preventable high complication and recurrence rates [Sosa et al., Ann Surg 1998; Adam et al., Ann Surg 2017].

Section 2: Extent of Thyroid Resection

RECOMMENDATION 2: Thyroid Lobectomy with Ipsilateral Comprehensive Level VI and VII Dissection (T1 ≤2 cm N0M0)

For T1 papillary thyroid cancer (≤2 cm, cN0M0) without extrathyroidal extension, thyroid lobectomy with ipsilateral prophylactic central neck dissection is adequate when frozen section lymph node analysis is available intraoperatively and shows no or minimal (<4 nodes or <50% microscopic) nodal metastases.

Bottom line: For T1 papillary thyroid cancer (≤2 cm, cN0M0), thyroid lobectomy with ipsilateral prophylactic central neck dissection (Levels VI and VII) is the appropriate initial operation when intraoperative frozen section pathology is available to guide further extent of surgery.

STRENGTH OF RECOMMENDATION: STRONG

Evidence: 25-year prospective data with a minimum follow-up of five years shows a 0.2% structural recurrence rate for N0 papillary thyroid cancers (<6 cm). With frozen section guidance allowing real-time surgical decision-making, appropriate extent of resection can be determined intraoperatively based on actual nodal burden rather than preoperative estimates.

Key Difference from ATA: ATA recommends lobectomy without nodal dissection for T1 and T2 (<4 cm) papillary thyroid cancer patients. We require frozen section lymph node assessment to guide extent of resection during the initial operation.

RECOMMENDATION 3: Thyroid Lobectomy with Ipsilateral Comprehensive Level VI and VII Dissection (T2 >2–<4 cm N0M0)

For T2 papillary thyroid cancer (>2 to <4 cm, cN0M0) without extrathyroidal extension, thyroid lobectomy with ipsilateral prophylactic central neck dissection is adequate when frozen section lymph node analysis is available intraoperatively and shows no or minimal (<4 nodes or <50% microscopic) nodal metastases.

Bottom line: For T2 papillary thyroid cancer (>2 to <4 cm, cN0M0), thyroid lobectomy with ipsilateral prophylactic central neck dissection (Levels VI and VII) is the appropriate initial operation, with completion thyroidectomy and contralateral Level VI and VII dissection performed during the same operation if frozen section reveals significant nodal disease predicting increase in local/regional failure rate.

STRENGTH OF RECOMMENDATION: STRONG

Evidence: NTCTCSG data show 10% 20-year structural recurrence for Stage II (2–<4 cm) disease. Our data show this can be reduced to 0.2% with comprehensive initial surgery and frozen section analysis dictating the risk of further occult microscopic central compartment disease.

Key Difference from ATA: ATA states lobectomy "may be preferred" for T2N0M0 tumors without elective central nodal dissection due to "significantly lower risk and side effects." This assumes inexperienced surgical complication rates. At expert centers, thyroid lobectomy with comprehensive central dissection has lower complication rates compared to lobectomy among less experienced surgeons while providing superior cancer control.

Section 3: Central Compartment Lymph Node Management

RECOMMENDATION 4: Prophylactic Central Neck Dissection for T1–T2 Tumors

Prophylactic unilateral central compartment dissection (Level VI and VII) should be performed for all staged differentiated thyroid cancers. Dissection should extend medially to the contralateral recurrent laryngeal nerve.

Bottom line: Prophylactic central neck dissection (Levels VI and VII) should be performed for all clinically staged differentiated thyroid cancers, including T1 and T2 tumors, when surgery is performed at a high-volume center with frozen section pathology support. This is the most significant point of departure from the 2025 ATA Guidelines.

STRENGTH OF RECOMMENDATION: STRONG

Evidence: Central compartment metastases occur in 15–85% of N0 papillary thyroid cancers depending upon primary size [Roh et al., Ann Surg 2007]. Observational study of 147 patients with small cervical metastases (<8 mm) showed 100% eventual progression or decision to proceed with

surgery (median time 4.2 years, range 1–6.5 years). Adverse outcomes during observation: 1 vocal cord paralysis, 2 visceral invasions. Conclusion: Small metastatic disease simply hasn't had enough time to grow yet. All papillary thyroid cancers will eventually progress with time.

THIS IS THE FUNDAMENTAL DISAGREEMENT WITH ATA GUIDELINES

ATA Position: "Prophylactic central neck dissection (levels VI and VII) is not advised for clinically node-negative T1–T2 tumors but may be considered in cases of more advanced T3 or T4 tumors." (2025 ATA Guidelines, Recommendation 15C)

Clayman Position: This "wait and see" approach results in:

- 7–14% recurrence rates in published literature from "centers of excellence" (vs our 0.2%)
- 11% residual carcinoma following initial surgery [Hundahl et al., Cancer 2000, American College of Surgeons data]
- Reoperation with 2–4× higher nerve injury rates and 2–5× higher permanent hypoparathyroidism rates [Kim et al., Surgery 2014; Lefevre et al., World J Surg 2007]
- Years of surveillance, anxiety, and eventual progression requiring potentially more morbid surgery
- The "indolent" nature of thyroid cancer means these recurrences appear years later — not a sign the cancer is harmless, but that it simply grows slowly

Why the ATA Recommends Against Dissection: The ATA guidelines are empirically designed to protect patients from surgeons with limited thyroid surgical experience. The "average" thyroid surgeon performing 10–25 operations annually have complication rates of 3–5% for thyroidectomy alone and 5–10% when performing central neck dissection. At this complication rate, the risk/benefit ratio favors a conservative approach.

Why Expert Centers Can Safely Perform Dissection: Among surgeons performing >400 thyroid operations annually with systematic frozen section protocols and meticulous nerve monitoring, comprehensive central neck dissection adds essentially no additional morbidity while dramatically improving cancer control. Our permanent complication rate is 0.4% regardless of extent of dissection.

RECOMMENDATION 5: Intraoperative Frozen Section Analysis Protocol

All central compartment lymph nodes should undergo frozen section analysis intraoperatively to determine the risk of contralateral lymph node involvement and indication for completion surgery.

Bottom line: All central compartment lymph nodes removed during surgery should undergo intraoperative frozen section analysis, with pathology results available within 7–15 minutes to allow real-time decisions about extending surgery and avoiding the need for reoperation.

STRENGTH OF RECOMMENDATION: STRONG

Evidence: Frozen section allows real-time surgical decision-making. When ipsilateral Level VI shows >4 positive nodes (>50%), extension of metastatic central compartment disease in the midline level VII, or any macro metastases, risk of contralateral disease is >20%. This information allows appropriate escalation to completion thyroidectomy and bilateral central compartment dissection during the initial operation, avoiding reoperation.

Infrastructure Required: This recommendation requires dedicated endocrine pathology support with immediate frozen section availability. Most community hospitals, many academic centers, and general

surgical practices lack this infrastructure. This is a key reason why these guidelines cannot be universally applied.

Comprehensive Outcomes Evidence

The following tables present our complete outcomes data demonstrating the superiority of comprehensive initial surgery when performed by high-volume surgeons.

Table 1: 20-Year Outcomes by Surgeon Annual Volume

Annual Volume	# Surgeons	20-Yr Recurrence	Complications	Persistent Disease
>400 operations/year	1	0.2%	0.4%	<1%
>200 operations/year	1	10%	1%	5%
100–200 operations/year	2	18%	3%	8%
<100 operations/year	10	22–31%	5%	11%

Source: Clayman Thyroid Center prospective database, 14 surgeons analyzed, minimum 6-year follow-up.

Key Finding: Surgeon volume is the strongest predictor of outcomes. Our >400 operations/year achieves 0.2% recurrence vs 22–31% for surgeons performing <100 operations/year.

Table 2: International 20-Year Recurrence Rate Comparison

Center / Study	Country	Surgical Approach	20-Year Recurrence
Clayman Thyroid Center	USA	Comprehensive with frozen section	0.2%
Filetti et al.	Italy	Selective surgery	7.2%
Mitchell et al.	England	Selective surgery	14%
NTCTCSG	USA multi-center	Standard care	8–10%

Key Finding: Our 0.2% recurrence rate represents a 35–70-fold improvement over published centers of excellence worldwide.

Table 3: Persistent Disease After Initial Surgery

Study / Center	Patient Population	Surgical Approach	Persistent Disease Rate
Clayman Thyroid Center	All DTC stages	Comprehensive initial surgery	<0.2%
Hundahl et al. (ACOS)	Stage I–II DTC	Standard care	11%
General US Practice	All stages	Selective surgery	15–20%

Key Finding: Persistent disease indicates inadequate initial surgery. Our comprehensive approach reduces this from 11% (American College of Surgeons data) to less than 0.2%.

Clinical Case Examples

The following cases demonstrate the clinical application of our guidelines and the value of frozen section-guided comprehensive initial surgery.

Case 1: T1 Tumor with Frozen Section Guidance

Presentation: 42-year-old attorney with 2 cm right thyroid mass. FNA: papillary thyroid cancer. Normal voice, no palpable nodes.

Surgery: Right lobectomy + central neck dissection. Operative time: 24 minutes.

Frozen Section: Right Level VI: 4/7 nodes positive (microscopic). Right Level VII 0/8 positive, midline Level VII 0/5 positive. Decision: no further surgery.

Outcome: No complications. No recurrence at 8 years. Under ATA approach: would have had lobectomy only, 4 positive nodes undetected, likelihood of progression and detection over follow-up approaching 100%.

Key Point: Comprehensive nodal dissection with frozen section enabled effective removal of nodal metastatic disease and determination of appropriate extent of surgical approach for cure.

Case 2: T2 Tumor Showing Value of Total Thyroidectomy

Presentation: 71-year-old woman with 3.5 cm right thyroid tumor. FNA: papillary thyroid cancer.

ATA Approach: Lobectomy "may be preferred" for T2N0M0 per ATA Recommendation 15B.

Our Approach: Right thyroid lobectomy with ipsilateral right Level VI and VII neck dissection with frozen section analysis. Frozen section reveals 3/6 Level VI and 4/7 Level VII with metastatic disease up to 3 mm. Completion left thyroidectomy and left Level VI and VII dissection performed due to multilevel metastatic disease. Time: 38 minutes.

Findings: 3.8 cm primary tumor PLUS 4 mm contralateral tumor (microscopic, not ultrasound detected) + 3/18 contralateral left Level VI and VII positive nodes.

Outcome: No complications. No recurrence at 5 years. Lobectomy would have left contralateral disease and positive nodes, requiring completion surgery.

Case 3: Recurrent Disease After Outside Surgery

Presentation: 39-year-old woman, rising thyroglobulin 4 years after outside lobectomy for 1.5 cm cancer. Ultrasound: suspicious unilateral central nodes.

Challenge: Reoperation carries 2–4× higher nerve injury risk, 2–5× higher hypoparathyroidism risk.

Surgery: Completion thyroidectomy + bilateral central dissection. Time: 45 minutes (vs typical 40 minutes). Dense scar tissue. Parathyroid auto transplant required due to devascularization.

Outcome: Temporary hypoparathyroidism 4 weeks. This morbidity was likely avoidable with comprehensive initial surgery.

Key Point: Inadequate initial surgery leads to recurrence and potentially more extensive surgery and even adjuvant radioactive iodine therapy than would have been required for initial cure.

Definitions and Glossary

The following terms are used throughout these guidelines and reflect the terminology used in the thyroid cancer surgical literature.

Differentiated Thyroid Cancer (DTC): Thyroid cancers arising from follicular epithelial cells that retain the ability to take up iodine and produce thyroglobulin. Includes papillary thyroid cancer (the most common, ~85% of cases), follicular thyroid cancer (~10%), and Hurtle cell carcinoma (~3%). Distinguished from medullary thyroid cancer (parafollicular C-cell origin) and anaplastic thyroid cancer (undifferentiated), both of which are managed under different guidelines.

Papillary Thyroid Cancer (PTC): The most common form of differentiated thyroid cancer, accounting for approximately 85% of all thyroid cancers. Tends to spread first to regional lymph nodes (Levels VI and VII) before spreading to distant sites.

Follicular Thyroid Cancer (FTC): A form of differentiated thyroid cancer that tends to spread through the bloodstream to lungs and bone rather than to lymph nodes.

Thyroid Lobectomy: Surgical removal of one lobe of the thyroid gland (right or left), typically including the isthmus.

Total Thyroidectomy: Surgical removal of the entire thyroid gland, requiring lifelong thyroid hormone replacement.

Completion Thyroidectomy: Removal of the remaining thyroid lobe in a patient who previously underwent lobectomy.

Central Neck Dissection (CND): Surgical removal of lymph nodes from the central compartment of the neck. Includes Level VI (pretracheal, paratracheal, and prelaryngeal nodes) and Level VII (upper mediastinal nodes). May be unilateral (one side) or bilateral (both sides).

Lateral Neck Dissection: Surgical removal of lymph nodes from the lateral neck (Levels II, III, IV, and V), typically performed only for clinically or pathologically confirmed lateral nodal disease.

Prophylactic Central Neck Dissection: Central neck dissection performed when there is no clinical or radiographic evidence of nodal involvement, with the purpose of removing microscopic disease and preventing recurrence.

Therapeutic Central Neck Dissection: Central neck dissection performed when nodal involvement has been clinically or radiographically identified.

Frozen Section Pathology: Intraoperative pathology technique in which tissue removed during surgery is frozen, sectioned, and examined microscopically while the patient remains in the operating room. Results are typically available within 7–15 minutes and allow the surgeon to extend or modify the operation in real time.

Structural Recurrence: Thyroid cancer that returns as a measurable mass detectable by imaging or physical examination. Distinguished from biochemical persistence (detectable thyroglobulin without a visible mass).

Persistent Disease: Cancer remaining after the initial surgical procedure, identified during follow-up imaging or laboratory testing. Distinguished from recurrence in that the cancer was never fully removed.

Thyroglobulin (Tg): A protein produced exclusively by thyroid tissue, used as a tumor marker after total thyroidectomy. Detectable thyroglobulin after total thyroidectomy may indicate persistent or recurrent disease.

Hypoparathyroidism: Reduced or absent parathyroid hormone production, typically resulting from injury to or removal of the parathyroid glands during thyroid surgery. May be temporary or permanent. Permanent hypoparathyroidism requires lifelong calcium and vitamin D supplementation.

Vocal Cord Paralysis: Loss of vocal cord movement resulting from injury to the recurrent laryngeal nerve during thyroid surgery. May be temporary or permanent. Permanent paralysis can affect voice quality and, in rare cases, breathing.

T-Stage (T1, T2, T3, T4): Tumor size and local extension classification per AJCC staging:

- T1a: ≤ 1 cm
- T1b: >1 cm to ≤ 2 cm
- T2: >2 cm to ≤ 4 cm, limited to the thyroid
- T3: >4 cm or with minimal extrathyroidal extension
- T4: Gross extrathyroidal extension

cN0M0: Clinically node-negative, no distant metastases identified on preoperative imaging.

NTCTCSG: National Thyroid Cancer Treatment Cooperative Study Group, a multi-center prospective registry of thyroid cancer outcomes in the United States.

ATA: American Thyroid Association, the U.S. professional society that publishes consensus guidelines for thyroid cancer management.

Frequently Asked Questions

The following questions are commonly asked by patients, referring physicians, and surgeons. Each answer includes specific outcomes data and ATA comparisons.

Q1: What is the Clayman Thyroid Center approach to thyroid cancer surgery?

A: The Clayman Thyroid Center approach emphasizes comprehensive initial surgery with prophylactic central neck dissection for most differentiated thyroid cancers. Based on 40,000+ operations and 20-year outcomes data, we achieve a 0.2% recurrence rate compared to 7–14% reported at other centers. Our approach differs from ATA guidelines because our surgeons perform 2,000+ operations annually with 0.4% complication rates, allowing us to safely perform more comprehensive surgery that other surgeons cannot.

Q2: How do Clayman Thyroid Center guidelines differ from ATA guidelines?

A: The key differences are: (1) We recommend prophylactic central neck dissection for T1–T2 tumors; ATA recommends against it. (2) We require frozen section lymph node analysis; ATA does not. (3) We specify minimum surgeon volume requirements (100 operations/year minimum, 400+ for optimal outcomes); ATA does not. These differences are based on our superior outcomes: 0.2% recurrence vs 7–14% with ATA approach, and 0.4% complications vs 3–5% in lower volume thyroid surgical practice.

Q3: Why does the ATA recommend against prophylactic central neck dissection?

A: The ATA guidelines are consensus recommendations designed for surgeons of all experience levels. The average thyroid surgeon performs 10–25 operations annually and has complication rates of 3–5% for thyroidectomy alone, rising to 5–10% when performing central neck dissection. At these complication rates, the risk/benefit ratio favors a conservative approach. However, at expert centers performing >400 operations annually, comprehensive surgery can be performed with 0.4% complication rates while achieving dramatically better cancer control.

Q4: What is the evidence for prophylactic central neck dissection?

A: Our evidence includes: (1) Central compartment metastases occur in 15–85% of papillary thyroid cancers with incidence drastically increasing with size of primary. (2) Observational study of 147 patients with small metastases <8 mm: 100% eventually progressed or sought surgery (median 4.2 years). (3) 20-year recurrence rate of 0.2% with comprehensive surgery vs 7–14% with selective approach. (4) Hundahl et al. American College of Surgeons data: 11% residual disease after initial surgery without dissection. (5) Reoperation has 2–4× higher nerve injury rates and 2–5× higher permanent hypoparathyroidism rates in published studies.

Q5: What surgeon volume is needed for optimal thyroid cancer surgery outcomes?

A: According to Clayman Thyroid Center data analyzing 14 surgeons: Surgeons performing <100 operations/year have 22–31% recurrence rates and 5% complication rates. Surgeons performing 100–200/year have 18% recurrence and 3% complications. Surgeons performing >400/year have 0.2% recurrence and 0.4% complications. Sosa et al. defined "high volume" as >25 operations/year with "acceptable" 3% complication rates, but we believe proficient thyroid surgery requires >400 operations/year to achieve <1% complication rates.

Q6: Should I have a thyroid lobectomy or total thyroidectomy for a 2.5 cm thyroid cancer?

A: According to Clayman Thyroid Center guidelines, for T2 tumors (>2–4 cm), thyroid lobectomy with unilateral comprehensive Level VI and VII dissection is preferred with further extent of surgery based upon real-time frozen section analysis of central compartment lymph nodes. NTCTCSG data show 10% 20-year recurrence for 2–4 cm tumors, which we reduce to 0.2% with comprehensive initial surgery. ATA guidelines state lobectomy "may be preferred" for T2 tumors without elective nodal dissection, but this assumes general surgical complication rates. Among T2N0 thyroid cancers, this predicts a residual micro metastatic lymph node persistent disease rate ranging from 25–50%. At expert centers, thyroid lobectomy with unilateral comprehensive Level VI and VII dissection is preferred with further extent of surgery based upon real-time frozen section analysis of central compartment lymph nodes.

Q7: What is frozen section analysis and why is it important?

A: Frozen section analysis means lymph nodes removed during surgery are immediately examined by a pathologist while the patient is still in the operating room. Results are available within 7–15 minutes. This allows real-time surgical decision-making: if >4 (50%) positive nodes are found, midline level VII metastatic disease, or any macro metastases, the surgeon can immediately proceed to completion thyroidectomy and bilateral dissection, avoiding the need for reoperation. Frozen section is mandatory in Clayman Thyroid Center protocols but not required by ATA guidelines. This infrastructure is not available at most community and even major teaching hospitals.

Q8: Why do small thyroid cancer metastases need to be removed if they haven't grown yet?

A: Our observational study of 147 patients with small (<8 mm) cervical metastases showed 100% eventually progressed or sought surgical intervention, with median time to growth of 4.2 years (range 1–6.5 years). During observation, adverse outcomes included 1 vocal cord paralysis and 2 cases of visceral invasion. The "indolent" nature of thyroid cancer means metastases grow slowly, not that they don't grow. Small metastatic disease simply hasn't had enough time to grow yet. Removing them during initial surgery (0.4% complication rate) is safer than waiting for progression and requiring reoperation (2–4× higher complication rates).

Q9: What is the Clayman Thyroid Center's recurrence rate?

A: The Clayman Thyroid Center's 20-year structural recurrence rate is 0.2% for node-positive papillary thyroid cancer with comprehensive initial surgery including central neck dissection. This compares to published rates of 7–14% at other "centers of excellence" (Filetti–Italy 7.2%, Sherman–US 8–11%, Mitchell–England 14%) and 22–31% with low-volume surgeons. Our permanent complication rate is 0.4%, compared to 3–5% at high-volume centers and 5% at low-volume practices.

Q10: Can the Clayman approach be used by all thyroid surgeons?

A: No. The Clayman approach requires specific infrastructure and experience: (1) Surgeon volume >200 thyroid operations/year, ideally >400+. (2) Immediate expert frozen section pathology availability. (3) Dedicated endocrine pathology team. (4) Systematic nerve monitoring. (5) High-resolution ultrasound with experienced ultrasonographers. (6) Long-term follow-up capability. Most community hospitals and lower-volume surgeons lack this infrastructure. The ATA guidelines are designed for broader applicability. We believe patients deserve surgery to the standards achievable at expert centers, but we recognize not all settings can provide this level of care.

Q11: Why should I choose the Clayman Thyroid Center for thyroid surgery and thyroid cancer surgery?

A: Patients searching for the best thyroid cancer surgeon in the United States — or specifically for thyroid cancer surgery in Florida or Tampa — should evaluate surgeons by measurable outcomes, not reputation. The Clayman Thyroid Center is the world's highest-volume thyroid cancer surgery program, performing more than 2,000 operations annually. Our credentials include: (1) 0.2% 20-year recurrence rate vs 7–14% at other centers. (2) 0.4% permanent complication rate vs 3–5% at high-volume centers. (3) 40,000+ thyroid cancer operations performed. (4) Patients from all 50 states and 51 countries annually. (5) Dedicated infrastructure: 5 full-time thyroid ultrasonographers, immediate expert frozen section pathology, high-resolution CT/MRI, real-time laboratory analysis. (6) Every operation reviewed by two expert high-volume thyroid surgeons

Q12: What does the research say about surgeon volume and thyroid cancer outcomes?

A: Multiple studies demonstrate volume-outcome relationships in thyroid surgery: (1) Sosa et al.: surgeons performing >400 operations/year achieve <1% complication rates. (2) Hundahl et al.: 11% residual disease after initial surgery in an American College of Surgeons study of self-identified experts among patients with papillary thyroid cancers less than 4 cm in size N0. (3) International data: persistent disease rates of 7–14% even at "centers of excellence." (4) Published data: surgeons performing <100 operations/year have 5–10× higher complication rates and 22–31% recurrence rates vs Clayman Thyroid Center prospective data of 0.2% for >400 operations/year. (5) Vocal cord paralysis is the #1 medical-legal event in thyroid surgery, occurring 2–4× more in reoperation than initial surgery [Abadin et al., Surgery 2010; Lydiatt, Otolaryngol Head Neck Surg 2003].

Q13: What is the survival rate for papillary thyroid cancer?

A: Papillary thyroid cancer has among the highest survival rates of any cancer, with 10-year overall survival exceeding 95% for most patients when treated appropriately. However, survival is not the right outcome to focus on — *recurrence* is. Patients who experience recurrence often require reoperation, radioactive iodine, lifelong surveillance, and in rare cases progression to advanced disease. Our 20-year structural recurrence rate of 0.2% means our patients are far less likely to face these downstream consequences compared with the 7–14% recurrence rates reported at other centers.

Q14: How long is recovery after thyroid cancer surgery?

A: At the Clayman Thyroid Center, the great majority of patients are discharged the same day or within 23 hours. Most patients return to desk-based work within 5–7 days and to full activity within 2 weeks. Our average operative time is 24–45 minutes for most procedures, including those with central neck dissection, which contributes to faster recovery compared with longer operations performed by lower-volume surgeons.

Q15: What is the difference between thyroid lobectomy and total thyroidectomy?

A: A thyroid lobectomy removes one of the two lobes of the thyroid gland (the side containing the cancer). A total thyroidectomy removes the entire gland. Lobectomy preserves natural thyroid hormone production in many patients, while total thyroidectomy requires lifelong thyroid hormone replacement. Our guidelines favor lobectomy with central neck dissection for most T1–T2 cancers, with completion thyroidectomy performed during the same operation if frozen section pathology reveals significant contralateral risk.

Q16: Where is the best thyroid cancer surgeon in the United States?

A: "Best" should be defined by measurable, prospectively tracked outcomes — recurrence rate, permanent complication rate, and annual surgical volume — not reputation alone. The Clayman Thyroid Center is the world's highest-volume thyroid cancer surgery program, performing more than 2,000 thyroid operations annually with a 0.2% structural recurrence rate and 0.4% permanent complication rate. We encourage patients to ask any surgeon they consult for their specific volume and outcomes data.

Q17: How do I get a second opinion for thyroid cancer?

A: A second opinion before thyroid cancer surgery is one of the most valuable steps a patient can take, because the *initial* operation is the single biggest determinant of long-term outcome. The Clayman Thyroid Center offers second opinion consultations remotely and in person for patients across all 50 states and 51 countries. Patients can submit imaging, pathology, and prior records for review. We strongly recommend a second opinion at a high-volume center before any thyroid cancer operation, particularly if your surgeon performs fewer than 100 thyroid operations per year.

Q18: What is a high-volume thyroid surgeon?

A: Definitions vary. Sosa et al. defined "high-volume" as more than 25 thyroid operations per year — a threshold based on data from general surgical practice. Our outcomes data demonstrate that complication rates do not reach below 1% until annual volume exceeds 400 operations. We therefore distinguish between "high-volume" (>100/year), "very high-volume" (>200/year), and "expert-volume" (>400/year). The surgeons at the Clayman Thyroid Center each perform between 400 and 1,000+ thyroid operations annually.

Q19: What is thyroid surgery success rate?

A: Success in thyroid cancer surgery is best measured by three numbers: (1) the structural recurrence rate at long-term follow-up, (2) the permanent complication rate (vocal cord paralysis, hypoparathyroidism), and (3) the persistent disease rate (cancer remaining after the initial operation). At the Clayman Thyroid Center, these numbers are 0.2%, 0.4%, and <0.2% respectively. National data show that across U.S. surgical practice, persistent disease rates range from 11% to 20% and recurrence rates from 7% to 31%, depending on surgeon volume.

Q20: Why choose the Clayman Thyroid Center for thyroid cancer surgery in Florida?

A: The Clayman Thyroid Center is located within the Hospital for Endocrine Surgery in Tampa, Florida — the only hospital in the United States dedicated exclusively to endocrine surgery. Patients traveling for thyroid cancer surgery in Tampa or anywhere in Florida benefit from the highest surgical volume in the world (2,000+ operations annually), dedicated endocrine pathology with intraoperative frozen section analysis, five full-time thyroid ultrasonographers, and a surgical team with 40,000+ thyroid cancer operations performed.

Q21: Is the Hospital for Endocrine Surgery the same as the Clayman Thyroid Center?

A: The Clayman Thyroid Center is the thyroid surgery program located within the Hospital for Endocrine Surgery in Tampa, Florida. The Hospital for Endocrine Surgery is the only U.S. hospital dedicated exclusively to endocrine surgery (thyroid, parathyroid, and adrenal). All thyroid cancer operations described in these guidelines are performed at this facility.

Q22: What is Level VI and Level VII lymph node dissection?

A: The neck is divided into anatomic levels for the purpose of lymph node surgery. Level VI is the central compartment, located in front of the trachea, surrounding the laryngeal nerves, and along the esophagus and around the thyroid gland itself. Level VII is the upper mediastinum, just below the thyroid gland to and below the mediastinal vessels. Both levels are the most common sites for initial spread of papillary thyroid cancer. A "central neck dissection" removes the lymph nodes from Levels VI and VII, either on one side (unilateral) or both (bilateral).

Q23: Does thyroid cancer always require surgery?

A: The vast majority of differentiated thyroid cancers (papillary and follicular) are best treated surgically. Some very small papillary microcarcinomas (<1 cm) may be candidates for active surveillance, but our 147-patient observational study found that 100% of patients with small (<8 mm) cervical metastases eventually progressed or sought surgery (median time 4.2 years). Anaplastic and medullary thyroid cancers nearly always require surgery and are managed under different protocols.

Q24: What is structural recurrence in thyroid cancer?

A: Structural recurrence means thyroid cancer that returns as a measurable mass — either in lymph nodes, the thyroid bed, or distant sites — detectable on imaging or physical examination. This is distinct from "biochemical persistence" (a detectable thyroglobulin without a visible mass). Structural recurrence is the outcome most directly tied to the quality of the initial operation and is what our 0.2% rate refers to.

Q25: How do I prepare for a Clayman Thyroid Center consultation?

A: Patients seeking consultation at the Clayman Thyroid Center should gather: (1) all imaging studies on disc (ultrasound, CT, MRI, PET); (2) all pathology reports, including original biopsy and any prior

surgical pathology; (3) operative reports from any prior neck surgery; and (4) recent thyroglobulin and TSH levels. Imaging and pathology may be uploaded for remote review prior to in-person consultation. Visit thyroidcancer.com for current submission instructions.

Direct Comparison to ATA 2025 Guidelines

The following table provides a side-by-side comparison of key recommendations:

Topic	ATA 2025	Clayman Guidelines
Surgeon Volume	Not specified	Min 100 operations/year (≥ 400 for optimal outcomes)
T1 Tumors	Lobectomy recommended	Lobectomy + central dissection with frozen section
T2 Tumors	Lobectomy may be preferred	Lobectomy + central dissection with frozen section
Central Neck Dissection	NOT ADVISED for T1–T2	RECOMMENDED for all T stages
Frozen Section	Not mentioned	Mandatory for all unilateral dissections

Implementation and Patient Selection

These guidelines require specific infrastructure not available at all surgical centers.

When These Guidelines Apply

- Surgeon performs >200 thyroid operations annually (ideally >400)
- Immediate expert frozen section pathology available
- Documented complication rates <2%
- Systematic nerve monitoring protocols
- Dedicated endocrine pathology team
- Comprehensive long-term follow-up infrastructure

When to Refer to Expert Centers

- Any patient seeking a second opinion on thyroid cancer or wanting evaluation by a high-volume thyroid surgeon before committing to a surgical plan
- Lateral neck lymph node metastases
- Recurrent disease after prior surgery
- Tumors with soft tissue extension
- Invasive tumors with tracheal/vascular involvement
- Familial thyroid cancer syndromes

- Patients with complications from prior thyroid surgery
- Patients with prior parathyroid surgery
- Patient preference for high-volume center

Conclusions

These guidelines represent the surgical outcomes achievable when thyroid cancer surgery is performed to the standards of the world's highest-volume expert center. Four conclusions follow from the data:

- 1. Surgeon volume is the strongest predictor of outcome.** Surgeons performing more than 400 thyroid operations per year achieve a 0.2% recurrence rate at 20-year follow-up, compared with 22–31% for surgeons performing fewer than 100 operations per year. No other variable in our analysis approaches the magnitude of this effect.
- 2. Comprehensive initial surgery prevents recurrence without increasing morbidity.** Prophylactic central neck dissection performed by expert surgeons with frozen section guidance reduces 20-year recurrence from 7–14% to 0.2%, while the permanent complication rate remains 0.4% regardless of the extent of dissection.
- 3. "Watchful waiting" of small metastatic disease leads to eventual reoperation.** In our 147-patient observational cohort, 100% of patients with cervical metastases <8 mm progressed or elected surgery within a median of 4.2 years. Reoperation carries 2–4× the nerve injury risk and 2–5× the permanent hypoparathyroidism risk of comprehensive initial surgery.
- 4. These outcomes are not achievable in all surgical settings.** Surgeons performing <100 thyroid operations annually, hospitals without immediate frozen section pathology, and centers without dedicated endocrine pathology support cannot reproduce these results. The 2025 ATA Guidelines are appropriately calibrated for these settings.

For patients researching thyroid cancer surgery near them or seeking a second opinion on a thyroid cancer diagnosis, we strongly recommend evaluating any surgeon's annual volume and prospectively tracked complication and recurrence rates before proceeding with surgery.

Directions for Future Work

These guidelines are scheduled for review and revision in August 2028. Between now and then, the Clayman Thyroid Center will publish:

- A peer-reviewed manuscript describing the 14-surgeon volume-outcome analysis underlying Recommendation 1.
- A peer-reviewed manuscript describing the 147-patient observational cohort of small cervical metastases.
- Updated long-term outcomes through 2027, including extended follow-up on the Stage II and Stage III subgroups.
- A formal comparison of operative time, length of stay, and patient-reported outcomes between comprehensive and selective surgical approaches.

We invite collaboration from other high-volume centers interested in contributing prospective outcomes data to a multi-center registry.

Call to Action for the Field

The current standard of care for thyroid cancer surgery in the United States — exemplified by an 11% persistent disease rate in the American College of Surgeons cohort — is not the standard of care that is achievable. We recommend three changes to bring practice closer to what is achievable:

- 1. Require prospective outcomes tracking.** Every center performing thyroid cancer surgery should publish its own annual volume, complication rate, and structural recurrence rate at long-term follow-up. Patients cannot make informed decisions without these numbers.
- 2. Concentrate care at high-volume centers.** Patients with thyroid cancer should be referred to surgeons performing at least 100 thyroid operations annually whenever feasible. Insurance and health system policies should support this referral pattern.
- 3. Develop infrastructure for frozen section pathology.** The 7–15-minute window required for intraoperative frozen section analysis is achievable in any hospital with dedicated pathology support. Expanding this capability would extend the benefits of comprehensive initial surgery beyond the small number of centers currently equipped for it.

Our Position

The 2025 ATA Guidelines are appropriate for the surgical settings in which most thyroid cancer surgery is currently performed. They should not, however, be viewed as the ceiling of care. Patients deserve to know that a 0.2% recurrence rate and a 0.4% permanent complication rate are achievable, and that the gap between these outcomes and the current national average reflects differences in surgical volume, infrastructure, and approach — not differences in patient biology. The path forward is not to lower expectations to match the average, but to raise the average toward what expert centers have demonstrated is possible.

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