Same thyroid cancer, different national practice guidelines: When discordant American Thyroid Association and National Comprehensive Cancer Network surgery recommendations are associated with compromised patient outcome

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Background. *The American Thyroid Association (ATA) and National Comprehensive Cancer Network (NCCN) guidelines have discordant recommendations for managing patients with differentiated thyroid cancer (DTC). We hypothesized that physician adherence to either of the 2009 extent of surgery guidelines of the ATA or NCCN was associated with improved survival, and that practice is most standardized nationally when guidelines are concordant.*

Methods. *Adult patients undergoing surgery for DTC were included from the National Cancer Database. Multivariable modeling was used to identify factors associated with nonadherence to the 2009 ATA or NCCN guidelines (2010–2011) and hypothetically examine the association of retrospective adherence to guidelines with survival (1998–2006).*

Results. *A total of 39,687 patients with DTC were included; 2,249 were not treated in accordance with ATA or NCCN guidelines. Factors independently associated with nonadherence were discordance between ATA and NCCN recommendations, black race, and treatment at nonacademic centers (*$P < .01$*). After adjustment, care not in accordance with either set of guidelines was associated with compromised survival (hazard ratio 1.16,* $P = .02$*).*

Conclusion. *A minority of patients received surgery for DTC not aligned with guidelines; nonadherent care was associated with compromised survival. Discordance in recommendations between guidelines is associated with reduction in adherent care, suggesting that standardizing guidelines could decrease confusion, increase adherence, and thereby may improve outcomes. (Surgery 2016;159:41-51.)*

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Differentiated thyroid cancer is the most common endocrine malignancy; its incidence is increasing faster than any other cancer in the United States.[1,2] Operative resection remains the mainstay of treatment, sometimes with the addition of radioactive iodine for the purpose of ablation or treatment.[3,4] Generally, prognosis is excellent when appropriate therapy is undertaken.[4]

As management of thyroid cancer has become more sophisticated, professional societies and

The data used in the study are derived from a de-identified NCDB file. The American College of Surgeons and the Commission on Cancer have not verified and are not responsible for the analytic or statistical methodology employed, or the conclusions drawn from these data by the investigator.

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Table I. Clinical and pathologic characteristics of the DTC risk categories, NCDB 2010–2011

Characteristic	*PTMC*	*Low-risk PTC*	*Intermediate/ High-risk PTC**	*FTMC*	*MI-FTC*
Category					
Histology	PTC	PTC	PTC	FTC	MI-FTC
Tumor size, cm	0.1–1.0	1.1–4.0	>4.0	0.1–1.0	1.1–4.0
Multifocality	–	–	+	–	–
Extrathyroidal extension	–	–	+	–	–
Lymph node metastases	–	–	+	–	–
Distant metastases	–	–	+	–	–
Patient age, yrs	<45	<45			
Surgical guidelines (2009)					
ATA	Lobectomy	Total thyroidectomy	Total thyroidectomy	Lobectomy	Total thyroidectomy
NCCN	Lobectomy	Lobectomy/total thyroidectomy	Total thyroidectomy	Total thyroidectomy	Lobectomy/total thyroidectomy

*Intermediate/high-risk PTC group was defined by presence of any of the listed characteristics.
ATA, American Thyroid Association; *DTC*, differentiated thyroid cancer; *FTMC*, follicular thyroid microcarcinoma; *MI-FTC*, minimally invasive follicular thyroid carcinoma; *NCCN*, National Comprehensive Cancer Network; *NCDB*, National Cancer Data Base; *PTC*, papillary thyroid carcinoma; *PTMC*, papillary thyroid microcarcinoma.

cooperative groups have developed "evidence-based" practice guidelines that provide specific recommendations regarding different aspects of thyroid cancer diagnosis, treatment, and surveillance.[5] During the past decade, treatment recommendations for differentiated thyroid cancer have evolved, with several professional organizations putting forth guidelines formulated by multidisciplinary task forces. In the United States, the American Thyroid Association (ATA) and the National Comprehensive Cancer Network (NCCN) represent the 2 major organizations that publish guidelines for the management of differentiated thyroid cancer.[5] These guidelines are developed by task forces comprising a multidisciplinary team of experts and assembled based on the strength of the best current evidence and consensus interpretation.[4-6]

Although physician adherence to thyroid cancer guidelines has been shown to be associated with improved patient outcomes,[4,6,7] data suggest that adoption of these guidelines at the population level remains inconsistent.[7,8] In a study from the Surveillance, Epidemiology, and End Results (SEER) dataset, introduction of the 2006 ATA guidelines for thyroid nodules and differentiated thyroid cancer[9] was associated with only a small increase (1%) in adherence to guidelines pertaining to the recommendation for total thyroidectomy for thyroid cancers >1 cm and/or cancers with high-risk features.[7] Previous studies have focused on identifying patient and clinical factors associated with nonadherence to guidelines, such as patient demographic, clinical, and pathologic characteristics[7,8,10]; however, data suggest that there are other factors associated with variation in practice patterns pertaining to the management of thyroid cancer in the United States, such as racial disparity, experience of providers, and other unmeasured nonclinical characteristics.[11]

Previous work investigating barriers to physician adherence to guidelines has identified discordance in recommendations between different sets of guidelines as a barrier to clinicians being able to use the evidence to support their day-to-day practice; as a result, practice variation persists.[12,13] The 2009 ATA and NCCN guidelines have some discordant recommendations pertaining to the operative management of differentiated thyroid cancer.[4,6] We hypothesized that practice patterns are most consistent nationally when the ATA and NCCN guidelines are concordant in their surgical recommendations, and that surgeon adherence to either set of surgical guidelines is associated with improved overall survival.

METHODS

The National Cancer Database (NCDB) is a joint program of the Commission on Cancer of the American College of Surgeons and the American Cancer Society. The NCDB is a nationwide clinical surveillance dataset that currently captures 70% of incident cancers across the United States. More than 85% of all thyroid cancer cases in the United States are captured in the database.[14] Data were coded according to the Commission on Cancer Registry Operations and Data Standards Manual, the American Joint Committee for Cancer Manual for Staging of Cancer, and the *International Classification of Disease for Oncology*. The Duke University Institutional Review Board granted this study an exemption status.