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Inappropriate use of suppressive doses of thyroid hormone in thyroid nodule management: Results from a nationwide survey

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To the Editor

Prescriptions for thyroid hormone preparations are steadily increasing, with levothyroxine being one of the ten most commonly prescribed medications in the United States (1). Current guidelines endorse synthetic levothyroxine monotherapy as the mainstay of hypothyroidism treatment. Additionally, since 1996, guidelines have recommended against use of thyroid hormone in suppressive doses for thyroid nodule management. This is because the potential harm of iatrogenic hyperthyroidism outweighs benefit, regardless of modest shrinkage of thyroid nodules observed in some patients on thyroid hormone suppressive therapy. Adverse effects of iatrogenic hyperthyroidism include cardiac and skeletal risks, especially in older adults. Despite widespread thyroid hormone prescribing, little is known about current practice patterns regarding thyroid hormone use.

We conducted a nationwide survey of 1000 randomly selected members of the American College of Physicians, American Academy of Family Practice and Endocrine Society. The modified Dillman survey method was used (2). Survey items addressed thyroid hormone preparations prescribed and indications for thyroid hormone use (Appendix). Data were de-identified and entered into a REDCap database (3).

Of the 883 response-eligible physicians, 389 physicians who managed thyroid hormone replacement completed the survey. Most respondents were male (64.5%) and had >20 years practice experience (48.6%). Endocrinologists comprised of 36.2% of physicians, 35.2% were family practitioners, 26.4% were internists and 2.2% other. Practice settings included private practice (49%), academic setting (19.9%), community-based academic affiliate (13.5%) and 17.6% other. Most physicians reported use of synthetic thyroxine (T4)

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preparations (94.1%). However, 29% of physicians also use desiccated thyroid hormone preparations and 25% prescribe liothyronine (T3) monotherapy and T4/T3 combination therapy. Additionally, 16% of physicians use over-the-counter dietary supplements or nutraceuticals as thyroid hormone therapy.

In addition to accepted indications for thyroid hormone use such as hypothyroidism (93.8%) and thyroid cancer (55.2%), almost one-fourth of surveyed physicians use thyroid hormone in suppressive doses for thyroid nodule management (24.5%); including 14% of surveyed endocrinologists. Although other unconventional indications for thyroid hormone use were also reported, including fatigue (4.1%), depression (3.1%) and weight gain (1.8%), these were far less common. Table 1 shows physician characteristics associated with thyroid hormone use in suppressive doses for thyroid nodule management in univariate and multivariable analyses.

Despite American Association of Clinical Endocrinologists and American Thyroid Association guidelines against thyroid hormone use in suppressive doses for thyroid nodule management, we found this practice is still being employed by close to one-fourth of physicians. The preparations of thyroid hormone used are also inconsistent with current guideline recommendations. Although the practice of using suppressive doses of thyroid hormone for thyroid nodule management was more common 16 years ago, when 40% of endocrinologists used thyroid hormone for this indication, it is worrisome that this inappropriate use of thyroid hormone continues. As almost half the population has thyroid nodules, this practice may put many patients at risk, especially the elderly who are more vulnerable to harm from suppressive doses of thyroid hormone. Understanding the practice patterns of physicians most likely to use thyroid hormone for thyroid nodule management will help target educational campaigns and guideline dissemination.

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APPENDIX

Selected Survey Items

- Which of the following thyroid hormone replacement therapies do you choose to treat your (hypothyroid) patients with? **Please check ALL that apply.**
 - ☐ Synthetic preparations, such as levothyroxine sodium (T4)
 - ☐ Desiccated thyroid preparations, such as Armour thyroid
 - ☐ T3 preparations alone, such as Cytomel
 - ☐ Combination therapy, such as with T4+T3 preparations
 - ☐ Over-the-counter dietary supplements and nutraceuticals, such as “thyroid support”
- For what reasons are your patients on thyroid hormone replacement? **Please check ALL that apply.**
 - ☐ Hypothyroidism
 - ☐ Thyroid cancer
 - ☐ Thyroid nodule growth suppression
 - ☐ Depression
 - ☐ Weight gain
 - ☐ Fatigue
 - ☐ Other (please specify) _____

TABLE 1

UNIVARIATE AND MULTIVARIABLE ANALYSES OF PHYSICIAN CHARACTERISTICS
ASSOCIATED WITH USE OF THYROID HORMONE IN SUPPRESSIVE DOSES FOR THYROID
NODULE MANAGEMENT

	Physicians using suppressive doses of thyroid hormone for thyroid nodule management [n (%)]	Univariate p value	Multivariable p value
Gender		0.182	0.935
Male	66 (26.7)		
Female	28 (20.6)		
Specialty		0.001	
Endocrinology	17 (14.2)		Ref
Internal Medicine/Primary Care	34 (35.4)		0.433
Family Practice	40 (30.3)		0.044
Other	4 (11.8)		0.101
Practice setting		<0.001	
Academic tertiary care center	6 (7.8)		Ref
Private practice	63 (33.3)		0.006
Community-based affiliate	14 (26.9)		0.731
Other	11 (16.2)		0.064
Number of patients on thyroid hormone replacement seen in 1 year		0.024	0.046
0–15	4 (9.3)		
16–50	36 (30.3)		
>50	54 (27)		
Years in practice		<0.001	0.002
0–5	2 (4.3)		
6–10	4 (8.3)		
11–20	25 (24.3)		
>20	63 (33.9)		