EDITOR’S COMMENTS                      ................................................. 2

THYROID HORMONE
Hypothyroidism is very common and is treated with thyroid hormone pills, usually in the form of Levothyroxine. In several large population studies, it has been shown that many patients are on too high or too low a dose. In particular, elderly patients are more likely to have a problem if they are over- or under-treated. This study was done to find out how common over- and under-treatment is in elderly hypothyroid patients and what factors may cause this problem.

Somwaru LL, Arnold AM, Joshi N, Fried LP, Cappola AR. High frequency of and factors associated with thyroid hormone over-replacement and under-replacement in men and women aged 65 and over. J Clin Endocrinol Metab 2009;94:1342-5. .......................... 3

THYROID CANCER
There has been a rapid increase in the number of new cases of thyroid cancer over the last 30 years. Most thyroid cancers occur in women and currently thyroid cancer is the 6th most common cancer in women. With the increased use of imaging and biopsy studies, smaller thyroid cancers can be found. This study was done to determine if the increase in new cases of thyroid cancer was due to finding more of these small thyroid cancers or due to an overall increase in all thyroid cancers.


HYPOTHYROIDISM
There appears to be a link between breast cancer, hypothyroidism and thyroid cancer. This may be due to the radiation treatments for breast cancer. This study looked at how many patients treated for breast cancer also developed hypothyroidism. It also looked at whether having radiation therapy as a treatment for breast cancer increased a patient’s risk for developing hypothyroidism.


THYROID CANCER
There are two main types of thyroid cancer: Papillary thyroid cancer and Follicular thyroid cancer. It has long been known that more people died if they had Follicular thyroid cancer than if they had Papillary thyroid cancer. This study is trying to find if this was because the follicular cancer was a worse cancer or if there are other reasons for this difference.


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A publication of the American Thyroid Association
EDITOR'S COMMENTS

Welcome to the first issue of the new format for Clinical Thyroidology for Patients. As before, this will be a collection of summaries of recently published articles from the medical literature that covers the broad spectrum of thyroid disorders. Starting with this issue, Clinical Thyroidology for Patients will be published on a monthly basis and include summaries of research studies that were discussed in the previous month’s issue of Clinical Thyroidology, a publication of the American Thyroid Association for physicians. Over the next few months, we will be adding new features that will focus on issues that hold a particular interest for patients. We will also include a Calendar of Events that will highlight educational forums and support groups that are organized by members of the Alliance for Thyroid Patient Education. The Alliance member groups consist of: the American Thyroid Association, the Graves’ Disease Foundation, the Light of Life Foundation and ThyCa: Thyroid Cancer Survivors Association.

IN THIS ISSUE, STUDIES ASK THE FOLLOWING QUESTIONS:

• Why is the number of new cases of thyroid cancer exploding in recent years?
• What is the smallest effective dose of radioactive iodine for initial treatment after surgery for thyroid cancer?
• Does a diagnosis of Follicular thyroid cancer carry a worse prognosis than a diagnosis of Papillary thyroid cancer?
• Is there a link between breast cancer and hypothyroidism?
• How common is under-treatment or over-treatment in the management of hypothyroid patients over the age of 65?

We welcome your feedback and suggestions on this new format. Let us know what you want to see in this publication. Happy reading!

— Alan Farwell, MD

HOW TO NAVIGATE THIS DOCUMENT: The Table of Contents and the Bookmarks are linked to the articles. To navigate, move your cursor over the article title you wish to see (either in the Contents or in the Bookmarks panel) and the hand will show a pointing finger, indicating a link. Left-click the title and the article will instantly appear on your screen. To return to the Contents, move the cursor to the bottom of the page and left-click Back to Table of Contents which appears on every page. If you would like more information about using Bookmarks please see the help feature on the menu bar of Acrobat Reader.
THYROID HORMONE

WHAT IS THE STUDY ABOUT?
Hypothyroidism is very common and is treated with thyroid hormone pills, usually in the form of Levothyroxine. In several large population studies, it has been shown that many patients are on too high or too low a dose. In particular, elderly patients are more likely to have a problem if they are over- or under-treated. This study was done to find out how common over- and under-treatment is in elderly hypothyroid patients and what factors may cause this problem.


WHAT WAS THE AIM OF THE STUDY?
To determine how often elderly hypothyroid patients are over- or under-treated and what factors may lead to this problem.

WHO WAS STUDIED?
The nation-wide Cardiovascular Health Study enrolled 5201 adults over the age of 65 from 1989 – 1990, which at baseline obtained a medical history, physical examination, assessment of health status and blood tests, including TSH and free thyroxine (FT₄). Among this large group, 339 individuals (9.2%) were taking various thyroid hormone preparations. This study examines these 339 individuals.

HOW WAS THE STUDY DONE?
The 339 patients taking thyroid hormone were divided into one of three groups: low TSH, euthyroid/normal TSH, and high TSH. No patients with thyroid cancer (and who may be intentionally slightly over-replaced) were included in the study. The patients were also divided into those taking Levothyroxine and those taking a combination of Levothyroxine plus Triiodothyronine.

WHAT WERE THE RESULTS OF THE STUDY?
The average age of the individuals studied was 72.9. Only 43% of patients had a normal TSH while 41% had a low serum TSH and 16% had a high TSH. More women were in the low TSH group than the euthyroid group. Among this group, 74% were taking levothyroxine alone and 26% were thyroid hormone products with both levothyroxine (L-FT₄) and triiodothyronine (T₃); the number of individuals with abnormal TSH concentrations were not different between the two groups.

Individuals with low serum TSH levels had lower weight and lower body-mass index and were taking fewer medications as compared with the euthyroid group. Individuals with diabetes mellitus were more likely to have either a low TSH or a high TSH while those with renal insufficiency more likely to have a normal TSH.

HOW DOES THIS COMPARE WITH OTHER STUDIES?
Other studies over large groups of individuals have shown a similar likelihood of abnormal TSH concentrations. Specifically looking at elderly patients, the Framingham Heart study showed a similar frequency of having a low TSH.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?
More elderly hypothyroid patients taking thyroid replacement therapy are either over- or under-replaced than have normal TSH concentrations. Patients at highest risk for having an abnormal TSH are those with lower body weight, lower body-mass-index and Diabetes mellitus. All elderly hypothyroid patients need to have their serum TSH levels more closely monitored and their thyroid replaced doses adjusted to result in a TSH in the normal range in order to avoid potential harmful side effects.

— Alan Farwell, MD

ATA THYROID BROCHURE LINKS
Hypothyroidism: http://thyroid.org/patients/patient_brochures/hypothyroidism.html
Thyroid Hormone Treatment: http://thyroid.org/patients/patient_brochures/hormonetreatment.html

ABBREVIATIONS & DEFINITIONS
Hypothyroidism: a condition where the thyroid gland is underactive doesn’t produce enough thyroid hormone. Treatment requires taking thyroid hormone pills.

Levothyroxine: the major hormone produced by the thyroid gland and available in pill form as Levoxyl™, Synthroid™, Levothroid™, and generic preparations.

Triiodothyronine: the active thyroid hormone, usually produced from Levothyroxine, available in pill form as Cytomel™

TSH: pituitary hormone that regulates the thyroid gland and that is the best initial blood test to determine if the thyroid gland is functioning normally and to determine the best dose of thyroid hormone treatment in hypothyroid patients
THYROID CANCER

WHAT IS THE STUDY ABOUT?
There has been a rapid increase in the number of new cases of thyroid cancer over the last 30 years. Most thyroid cancers occur in women and currently thyroid cancer is the 6th most common cancer in women. With the increased use of imaging and biopsy studies, smaller thyroid cancers can be found. This study was done to determine if the increase in new cases of thyroid cancer was due to finding more of these small thyroid cancers or due to an overall increase in all thyroid cancers.


WHAT WAS THE AIM OF THE STUDY?
This study was done to determine if the increase in new cases of thyroid cancer was due to using more sensitive imaging tests. If this were the case, then one would expect more cases of smaller sized cancers with fewer cases of larger sized cancers.

WHO WAS STUDIED?
For this study, the authors collected information from 47,516 patients who were diagnosed with thyroid cancer between 1980 and 2005 and whose information was stored in nation-wide thyroid cancer registries (SEER-9 and SEER-13) which include 14% of the population of the United States. The patients came from many different ethnic backgrounds, including Whites, Blacks, Hispanics and Asian/Pacific Islanders. Both men and women were included in the study.

HOW WAS THE STUDY DONE?
The authors searched the nation-wide registries for all confirmed cases of thyroid cancers and divided the number of new cases by type of cancer, cancer size, race/ethnic background, and sex.

WHAT WERE THE RESULTS OF THE STUDY?
The authors found that the rate of new thyroid cancers increased 2-3-fold over the 25 year period. This increase in both men and women was due entirely to an increase in new cases of papillary thyroid cancer (the most common type of thyroid cancer) as the rate of new cases of other types of thyroid cancer did not change. They also found, as was expected, a large increase in cases of smaller sized cancers. Unexpectedly, they also found that there was an increase in cases of larger sized cancers. Thus, there has been an increase in new cases of thyroid cancer of all sizes.

HOW DOES THIS COMPARE WITH OTHER STUDIES?
Previous studies in the United States and in Canada showed a similar increase in the rate of new Papillary thyroid cancers. In these prior studies it was suggested that this increase was due to an increase in small thyroid cancers. The study from Canada also showed an increase in large thyroid cancers. The current study is the only one to show an increase in all sizes of thyroid cancer.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?
The rapid increase in new cases of thyroid cancer detected over time can be partly, but not fully, explained by increased use of improved imaging tests. It is important to know the other causes that are responsible for the new cases to help identify patients who are at risk of developing thyroid cancer.

— Mona Sabra, MD

ATA THYROID BROCHURE LINKS
Thyroid cancer: http://thyroid.org/patients/patient_brochures/cancer_of_thyroid.html

ABBREVIATIONS & DEFINITIONS
Papillary thyroid cancer – the most common type of thyroid cancer

SEER: Surveillance, Epidemiology and End Results program, a nation-wide anonymous cancer registry generated by the National Cancer Institute that contains information on 26% of the United States population. Website: http://seer.cancer.gov/
THYROID CANCER

WHAT IS THE STUDY ABOUT?
Patients with thyroid cancer are often treated with radioactive iodine (I-131) after surgery to destroy any normal and/or cancerous thyroid tissue that may be left in the neck. This study looked at how well several different doses of radioactive iodine destroyed this thyroid tissue remaining in the neck.


WHAT WAS THE AIM OF THE STUDY?
The aim of this study was to determine the lowest dose of radioactive iodine necessary to destroy any thyroid tissue remaining in the neck following thyroid cancer surgery.

WHO WAS STUDIED?
This study took place in a single hospital treatment center in Croatia. They studied 466 patients treated for papillary thyroid cancer. 404 patients were women and 62 were men. The average age of the patients studied was 47 years old.

HOW WAS THE STUDY DONE?
The treatment records of the thyroid cancer patients were reviewed. All patients had surgery to remove the thyroid prior to the radioactive iodine therapy. The dose of radioactive iodine was made by the treating doctor and fell into four groups: 24 mCi, 40 mCi, 50 mCi and 124 mCi. To determine the how well the radioactive iodine worked, patients had repeat scans twice over the next year and a half. A successful treatment meant that there was no uptake in the neck after the follow up scans.

WHAT WERE THE RESULTS OF THE STUDY?
Patients that were treated with either 50 mCi or 124 mCi were more likely to have a successful result than those that were treated with either 24 mCi or 40 mCi. Since there was no difference between 50 mCi and 124 mCi, it appears that the 50 mCi dose was the lowest dose to treat thyroid cancer patients after initial surgery.

HOW DOES THIS COMPARE WITH OTHER STUDIES?
There have been many other smaller studies looking at the best dose of radioactive iodine. Several smaller studies have suggested that 50 mCi was not as good as 100 mCi in destroying thyroid tissue after surgery. Several other studies have shown that 50 mCi was better than lower doses. The current study is the largest one from a single treatment center.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?
Since large doses of radioactive iodine may cause some side effects in a small number of patients, the lowest effective dose of radioactive iodine should be used to destroy thyroid tissue in the neck following initial surgery for thyroid cancer. This study suggests that doses greater than 50 mCi may not be needed.

— Frank Crantz, MD

ATA THYROID BROCHURE LINKS
Thyroid cancer: http://thyroid.org/patients/patient_brochures/cancer_of_thyroid.html
Radioactive iodine therapy: http://thyroid.org/patients/patient_brochures/radioactive.html

ABBREVIATIONS & DEFINITIONS
Papillary thyroid cancer — the most common type of thyroid cancer
Radioactive iodine — this plays a valuable role in diagnosing and treating thyroid problems since it is taken up only by the thyroid gland. There are two types of radioactive iodine used for thyroid problems. I-131 is the destructive form used to destroy thyroid tissue in the treatment of thyroid cancer and with an overactive thyroid. I-123 is the non-destructive form that does not damage the thyroid and is used in scans to take pictures of the thyroid.
HYPOTHYROIDISM

WHAT IS THE STUDY ABOUT?
There appears to be a link between breast cancer, hypothyroidism and thyroid cancer. This may be due to the radiation treatments for breast cancer. This study looked at how many patients treated for breast cancer also developed hypothyroidism. It also looked at whether having radiation therapy as a treatment for breast cancer increased a patient’s risk for developing hypothyroidism.


WHAT WAS THE AIM OF THE STUDY?
This study was done to examine if hypothyroidism was more common in women with breast cancer treated with surgery, radiation therapy and chemotherapy as compared to women in general. The study also looked at the effects of radiation treatment on becoming hypothyroid.

WHO WAS STUDIED?
Women in Norway with stage II/III breast cancer treated with surgery, radiation and chemotherapy from 1998-2002 were studied. These women were under 75 years old. Women of similar age from a general health survey in Norway without breast cancer made of the general population.

HOW WAS THE STUDY DONE?
A total of 861 women were asked to complete a questionnaire and give blood to measure thyroid levels in their blood and a total of 403 women agreed to participate. The women were asked if they had a thyroid problem and, if so, were they diagnosed before or after they were treated for breast cancer?

WHAT WERE THE RESULTS OF THE STUDY?
Almost 1 in 4 women with breast cancer reported having a thyroid problem as compared to 1 in 10 in the general population. Hypothyroidism was the most common thyroid problem in these women and two out of three hypothyroid women were diagnosed with their hypothyroidism after being treated for breast cancer. There was a slight increase in hypothyroidism in patients treated with radiation therapy.

HOW DOES THIS COMPARE WITH OTHER STUDIES?
Other large studies have found that the risk of hypothyroidism is not increased in patients who received radiation therapy. However, overall more breast cancer patients were found to have hypothyroidism than cancer-free patients.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?
This study suggests that women with breast cancer should have thyroid tests checked and be evaluated for hypothyroidism periodically after their treatment.

—Heather Hofflich, MD

ATA THYROID BROCHURE LINKS
Hypothyroidism: http://thyroid.org/patients/patient_brochures/hypothyroidism.html

ABBREVIATIONS & DEFINITIONS
Hypothyroidism: a condition where the thyroid gland is underactive and doesn’t produce enough thyroid hormone. Treatment requires taking thyroid hormone pills.
THYROID CANCER

WHAT IS THE STUDY ABOUT?
There are two main types of thyroid cancer: Papillary thyroid cancer and Follicular thyroid cancer. It has long been known that more people died if they had Follicular thyroid cancer than if they had Papillary thyroid cancer. This study is trying to find if this was because the follicular cancer was a worse cancer or if there are other reasons for this difference.


WHAT WAS THE AIM OF THE STUDY?
To determine if the type of thyroid cancer, papillary or follicular, by itself affects how many people die of the cancer.

WHO WAS STUDIED?
The investigators reviewed the records of 875 patients with Papillary thyroid cancer and 350 with Follicular thyroid cancer who were treated at the University of Würzburg (Germany) from January 1978 through December 2002. All patients had been treated with surgery to remove the entire thyroid followed by radioactive iodine therapy, except for patients with a very small papillary thyroid cancer (<1 cm).

HOW WAS THE STUDY DONE?
The records of the patients were reviewed for many factors including age, sex, size of the tumor, whether there was a single or multiple cancers in the thyroid, whether the cancer spread into the surrounding fat and muscle, whether the lymph nodes in the neck were involved with cancer, and whether the cancer had spread beyond the neck to other tissues such as the lung, bone or liver.

WHAT WERE THE RESULTS OF THE STUDY?
The average time the patients were followed was about 10 years. As has been known for a while, most people with either type of thyroid cancer survived their cancer. The 20-year thyroid cancer specific survival for all patients with Papillary thyroid cancer was 90.6% and for Follicular thyroid cancer was 73.7%. When patients with spread of the cancer to areas outside of the neck were not counted, the survival for Papillary thyroid cancer was 93.1% and for Follicular thyroid cancer was 80.2% at 20 years. There was no difference in survival for patients with either type of thyroid cancer when the cancer had spread outside of the neck. Patients were more likely to survive their cancer if (1) it had not spread outside the neck; (2) were younger; (3) had a smaller cancer; and (4) the cancer had not spread into the tissues around the thyroid. More patients with Follicular thyroid cancer died because they were older, had larger cancers, and more frequently had spread of their cancer outside the neck. Thus, the type of cancer, Papillary thyroid cancer or Follicular thyroid cancer, did not by itself affect survival of patients.

HOW DOES THIS COMPARE WITH OTHER STUDIES?
Several other studies have shown that advanced age, large tumor size, and spread outside the neck increase the risk of death from thyroid cancer, and that patients with follicular thyroid cancer usually present with more of these features than those with papillary cancer. Some studies have indicated that how these cancers look under the microscope does predict who are more likely to die of their cancer.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?
While most patients with thyroid cancer do not die as a result of their cancer, the key risk factors for dying from Papillary thyroid cancer or Follicular thyroid cancer are older age, larger cancer size, spread of the cancer into other tissues surrounding the thyroid, and whether there is spread of the cancer outside of the neck. When these factors are taken into consideration, the cancer type is less important in determining prognosis.

— Glenn Braunstein, MD

ATA THYROID BROCHURE LINKS
Thyroid cancer: http://thyroid.org/patients/patient_brochures/cancer_of_thyroid.html

ABBREVIATIONS & DEFINITIONS
Papillary thyroid cancer — the most common type of thyroid cancer
Follicular thyroid cancer — the second most common type of thyroid cancer
GOAL
The goal of our organizations is to provide accurate and reliable information for patients about the diagnosis, evaluation and treatment of thyroid diseases.

WHO WE ARE

AMERICAN THYROID ASSOCIATION
www.thyroid.org
ATA Patient Resources: http://www.thyroid.org/patients/
Find a Thyroid Specialist: www.thyroid.org
Phone (toll-free): 1-800-THYROID
e-mail: thyroid@thyroid.org

ATA Mission: The ATA leads in promoting thyroid health and understanding thyroid biology.
ATA Vision: The ATA is the leading organization focused on thyroid biology and the prevention and treatment of thyroid disorders through excellence and innovation in research, clinical care, education, and public health.
ATA Values: The ATA values scientific inquiry, clinical excellence, public service, education, collaboration, and collegiality.

To further our mission, vision and values the ATA sponsors “Friends of the ATA” online to advance the information provided to patients and the public such as this publication, Clinical Thyroidology for Patients. We welcome your support.

GRAVES’ DISEASE FOUNDATION
www.ngdf.org
Phone (toll-free): 1-877-NGDF-123 or 643-3123
e-mail: Gravesdiseasefd@gmail.com

Founded in 1990, the Graves’ Disease Foundation offers support and resources to Graves’ disease patients, their families, and health care professionals. Their mission is to find the cause of and the cure for Graves’ thyroid disease through research, to improve the quality of life for persons with Graves’ disease and their caregivers and to educate persons with Graves’ disease, their caregivers, healthcare professionals, and the general public about Graves’ disease and its treatment. The website features a monitored bulletin board.

LIGHT OF LIFE FOUNDATION
www.checkyourneck.com
e-mail: info@checkyourneck.com

The Light of Life Foundation, founded in 1997, is a nonprofit organization that strives to improve the quality of life for thyroid cancer patients, educate the public and professionals about thyroid cancer, and promote research and development to improve thyroid cancer care.

THYCA: THYROID CANCER SURVIVORS’ ASSOCIATION, INC.
www.thyca.org
Phone (toll-free): 877 588-7904
e-mail: thyca@thyca.org

ThyCa: Thyroid Cancer Survivors’ Association, Inc., founded in 1995, is an international nonprofit organization, guided by a medical advisory council of renowned thyroid cancer specialists, offering support and information to thyroid cancer survivors, families, and health care professionals worldwide.
## ATA Alliance for Thyroid Patient Education

### CALENDAR OF EVENTS

Educational forums, patient support groups and other patient-oriented meetings

<table>
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<th>DATE</th>
<th>EVENT</th>
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| Saturday, July 25, 2009 | **San Francisco/Northern California Thyroid Cancer Survivors’ Workshop**  
http://www.thyca.org/conferences.htm                                                                                           | Stanford, CA        | ThyCa        |
| August 1, 2009      | **Light of Life Golf Outing**  
www.checkyourneck.com                                                                                                               | Long Island, NY     | Light of Life |
| September 2009      | **Thyroid Cancer Awareness Month**  
www.ThyCa.org                                                                                                                        |                     | ThyCa        |
| September 12, 2009  | **Light of Life Educational Symposium**  
www.checkyourneck.com                                                                                                               | New York, NY        | Light of Life |
| September 12, 2009  | **ThyCa Workshop and Symposium**  
www.ThyCa.org                                                                                                                        | Denver, CO          | ThyCa        |
| September 23–27, 2009 | **ATA 80th Annual Meeting**  
www.thyroid.org  
http://www.thyroid.org/ann_mtg/2009_80th/index.html                                                                                 | The Breakers Hotel  | ATA          |
| September 29, 2009  | **Light of Life Annual Fundraiser**  
www.checkyourneck.com                                                                                                               | New York, NY        | Light of Life |
| October 16-18, 2009 | **ThyCa 12th International Thyroid Cancer Survivors’ Conference**  
http://www.thyca.org/conferences.htm                                                                                               | Boston, MA          | ThyCa        |
| October 16–18, 2009 | **Patient & Family Conference**  
www.ngdf.org  
http://www.ngdf.org/conference.php                                                                                                 | Charlotte, NC       | Graves’ Disease Foundation |