Thyroid Surgery

Saturday September 14, 2019

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The rule of 20: Only 20% of the people will remember 20% of what you said 20 minutes after your lecture.

Shaha's Aphorisms

Thyroid Literature

Medline-Last Ten Years

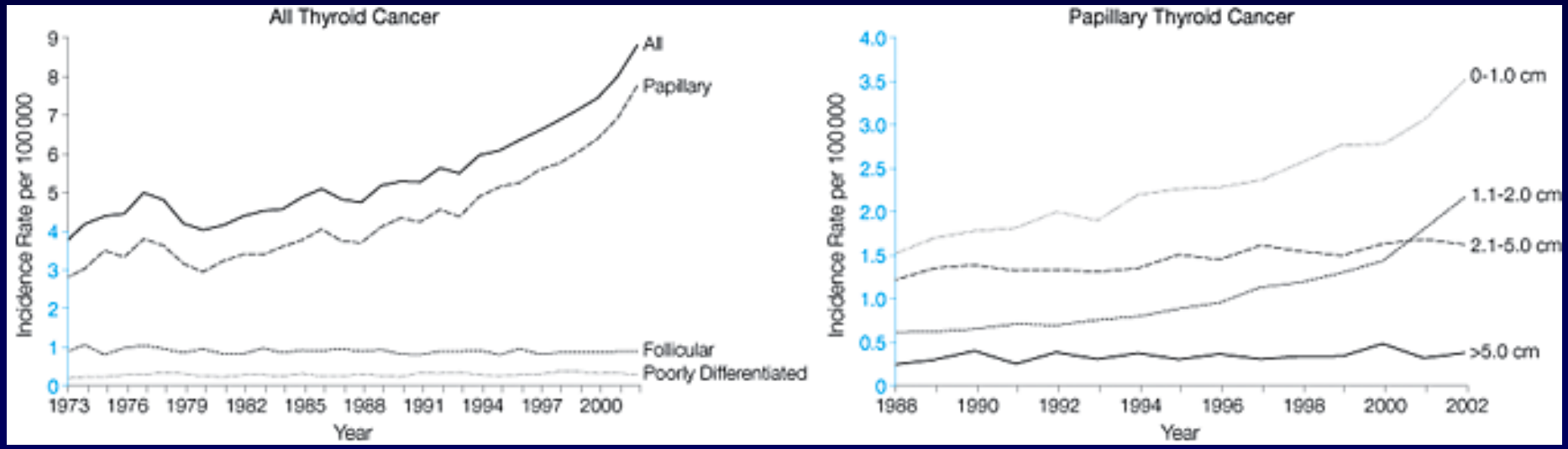
Thyroid Disease	**45,050**
Thyroid Tumors	**17,379**

- New Paper on Thyroid Disease – Every 2 Hours
- New Paper on Thyroid Tumors– Every 6 Hours

Thyroid Google search **20 million**

Thyroid Cancer Google search **13 million**

Trends in Incidence of Thyroid Cancer and Papillary Tumors by Size in the United States



Davies, L. et al. JAMA 2006;295:2164-2167.

The New York Times

The Opinion Pages | OP-ED CONTRIBUTOR

An Epidemic of Thyroid Cancer?

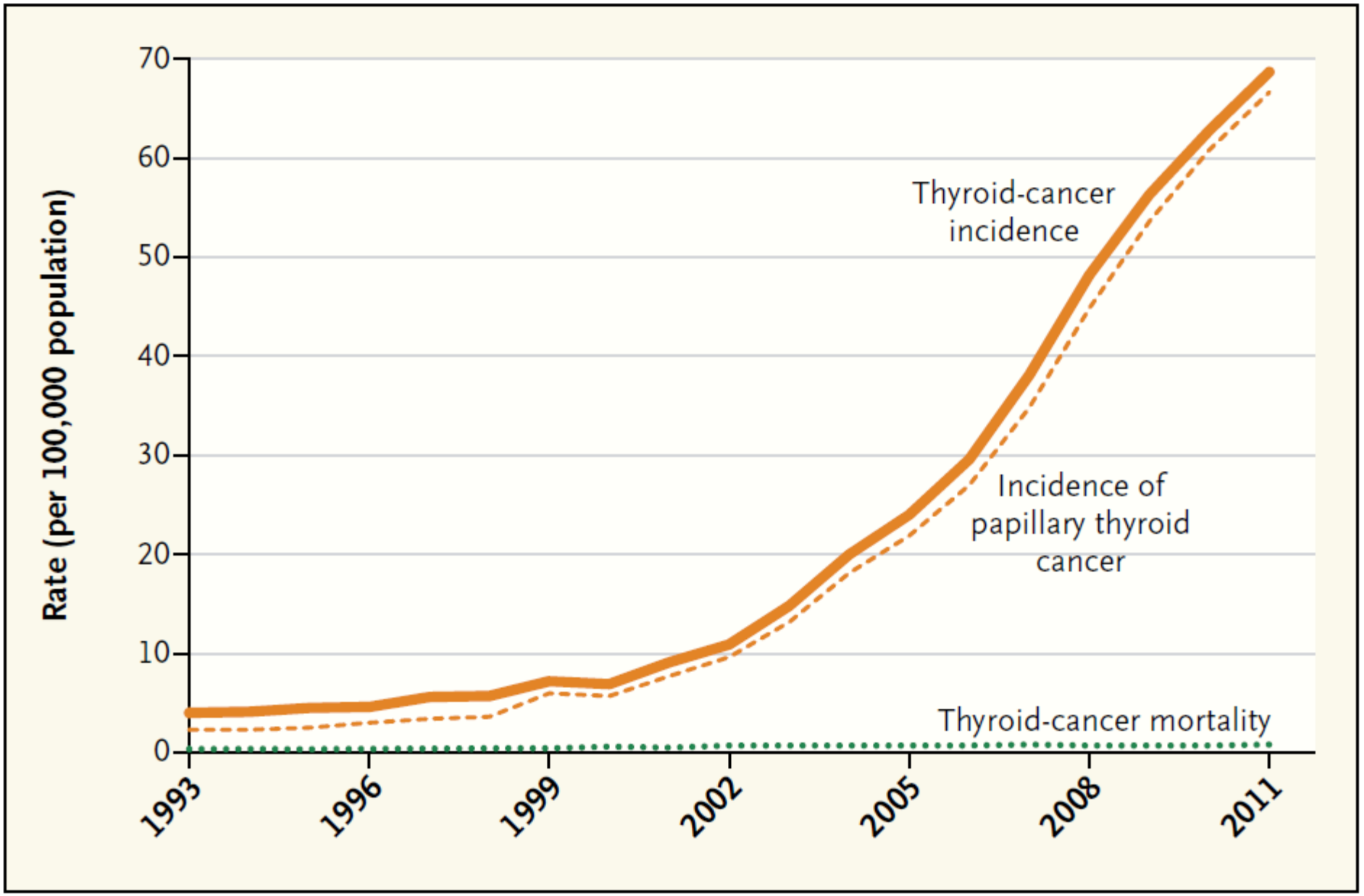
By H. GILBERT WELCH NOV. 5, 2014

Thyroid Cancer

Epidemic

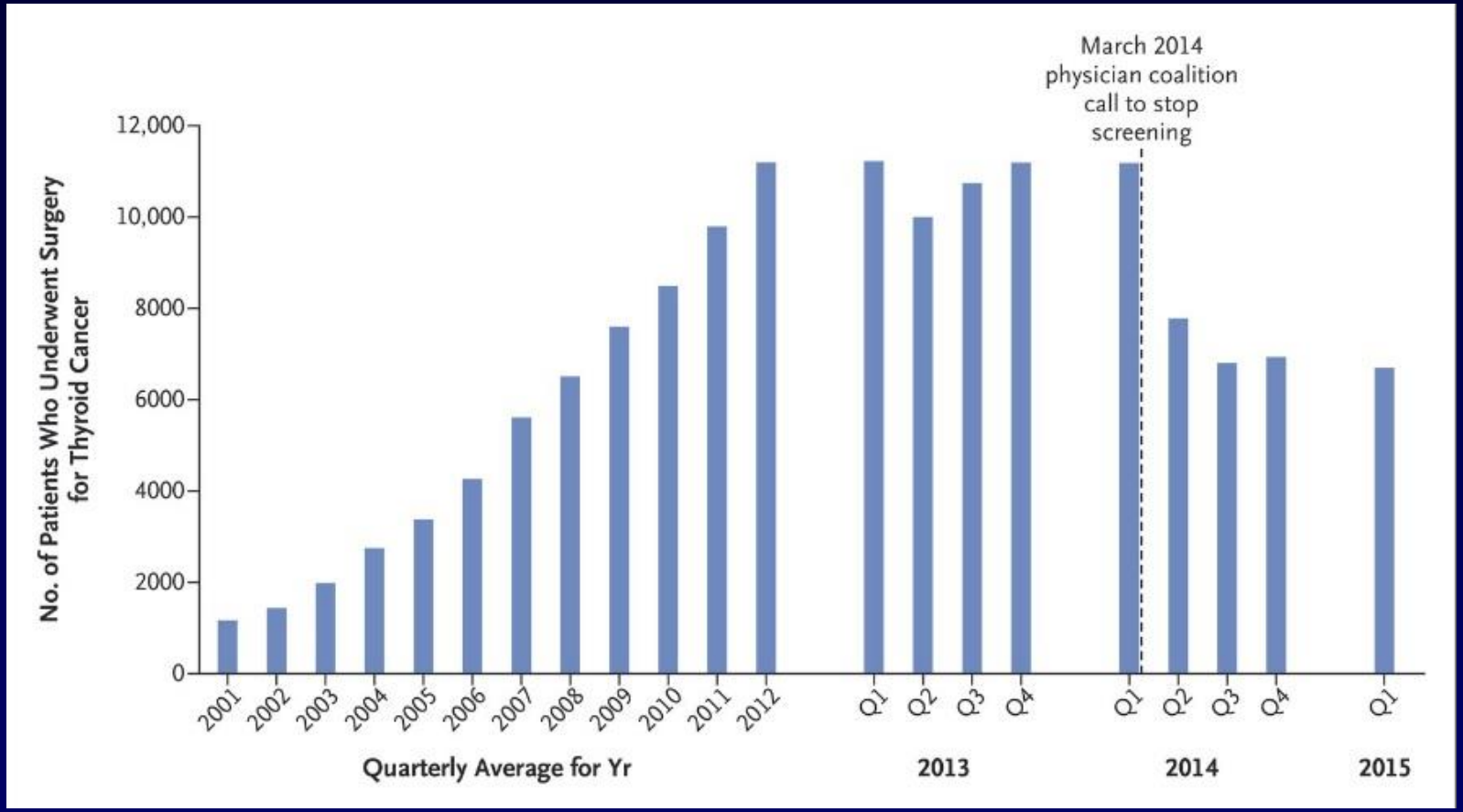
or

Pandemic



Thyroid-Cancer Incidence and Related Mortality in South Korea, 1993–2011.

Trend in the Number of Operations for Thyroid Cancer in South Korea 2001-2015



Ahn, HS … Welch, HG. *New England Journal of Medicine* December 10, 2015 373(24):2389

Incidentaloma of the Thyroid

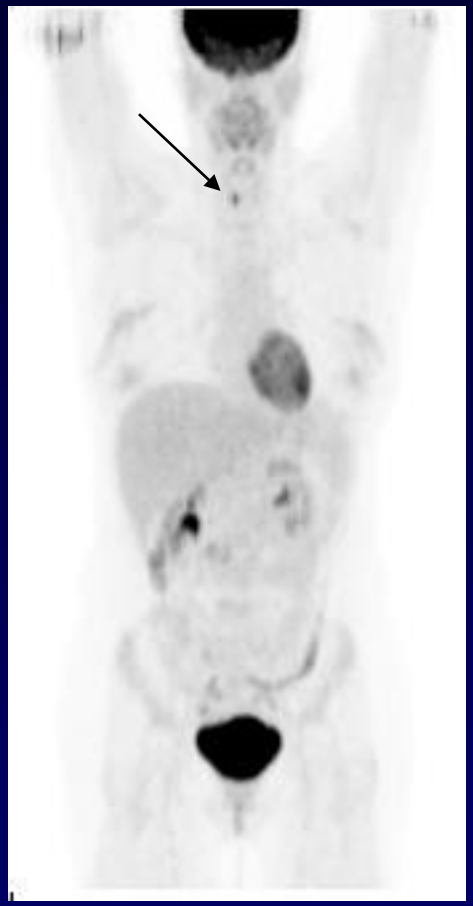
Clinical –

- Routine physical exam
- Obstetrics – Check up
- Pregnancy – Prenatal

Imaging –

- CT
- MRI – Trauma, cervical spine
- Ultrasound – Carotid, breast

PET Scan –



PET Incidentaloma

PET Associated Incidental Neoplasms (PAIN)

- Focal vs Diffuse Uptake
- 50% malignancy in patients with focal uptake
- Oncocytic pathology, tall cell or insular tumors

Katz/Shaha. J Am Coll Surg 2008

Diagnostic Evaluation of Thyroid Nodule

- Ultrasound Guided FNA
- Bethesda Classification
- Bethesda III- Afirma testing and molecular testing

Thyroid Cancer

A Unique Human Neoplasm

- Age is the most important prognostic factor
- No stage III & IV cancers in pts below 45
- Multicentricity of thyroid cancer is frequent – no prognostic impact
  Microscopic tumor – “laboratory cancer”
- Nodal metastasis has no impact on outcome
- Impact of extrathyroidal spread
- Grade of the tumor & histologic poorly differentiated features

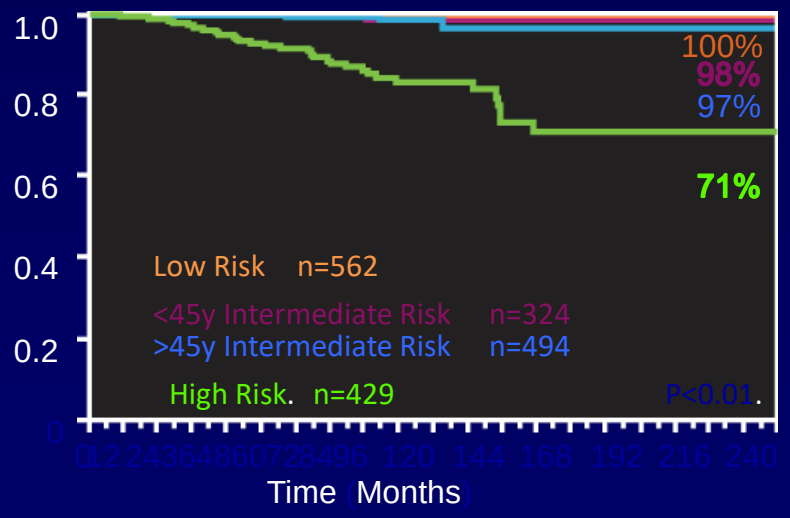
Surgical Principles

- Evaluate the risk groups
- Evaluate the prognostic factors
- Evaluate the extent of disease
- Evaluate extrathyroidal extension
- Cost effective/Evidence based management
- Avoid overtreatment and treatment related surgical & medical complications


CLINT EASTWOOD
THE GOOD
AND THE BAD
UGLY

Risk Groups

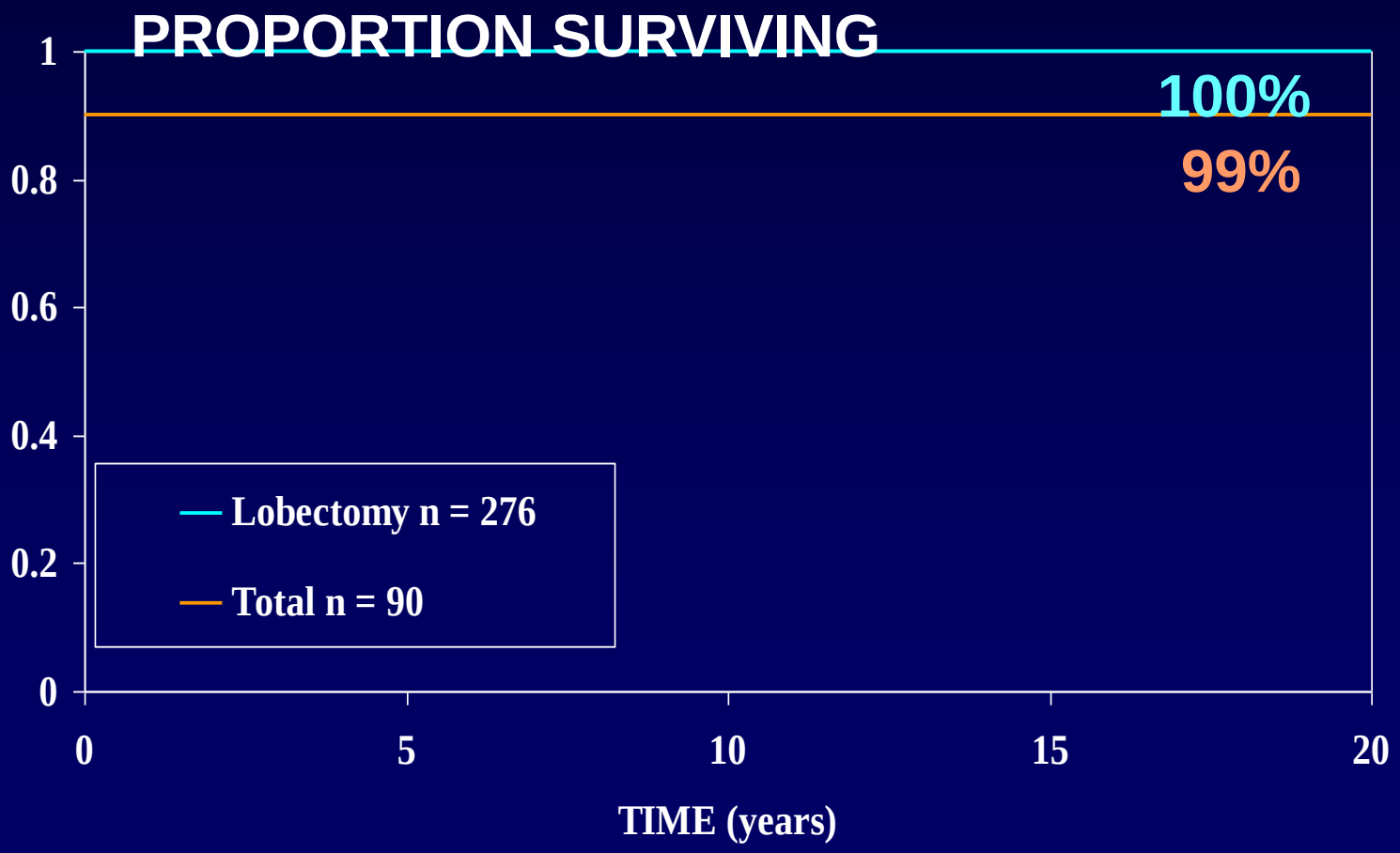
Prognostic Factors	Low	Intermediate		High
Age	<45	>45	<45	>45
Gender	Female			Male
Size	< 4 cms.			> 4 cms.
Extent	Intraglandular			Extraglandular
Grade	Low			High
Dist. Mets.	Absent			Present



Differentiated Thyroid Cancer 1980-1980

SURVIVAL: Lobectomy vs. Total

Low Risk Group

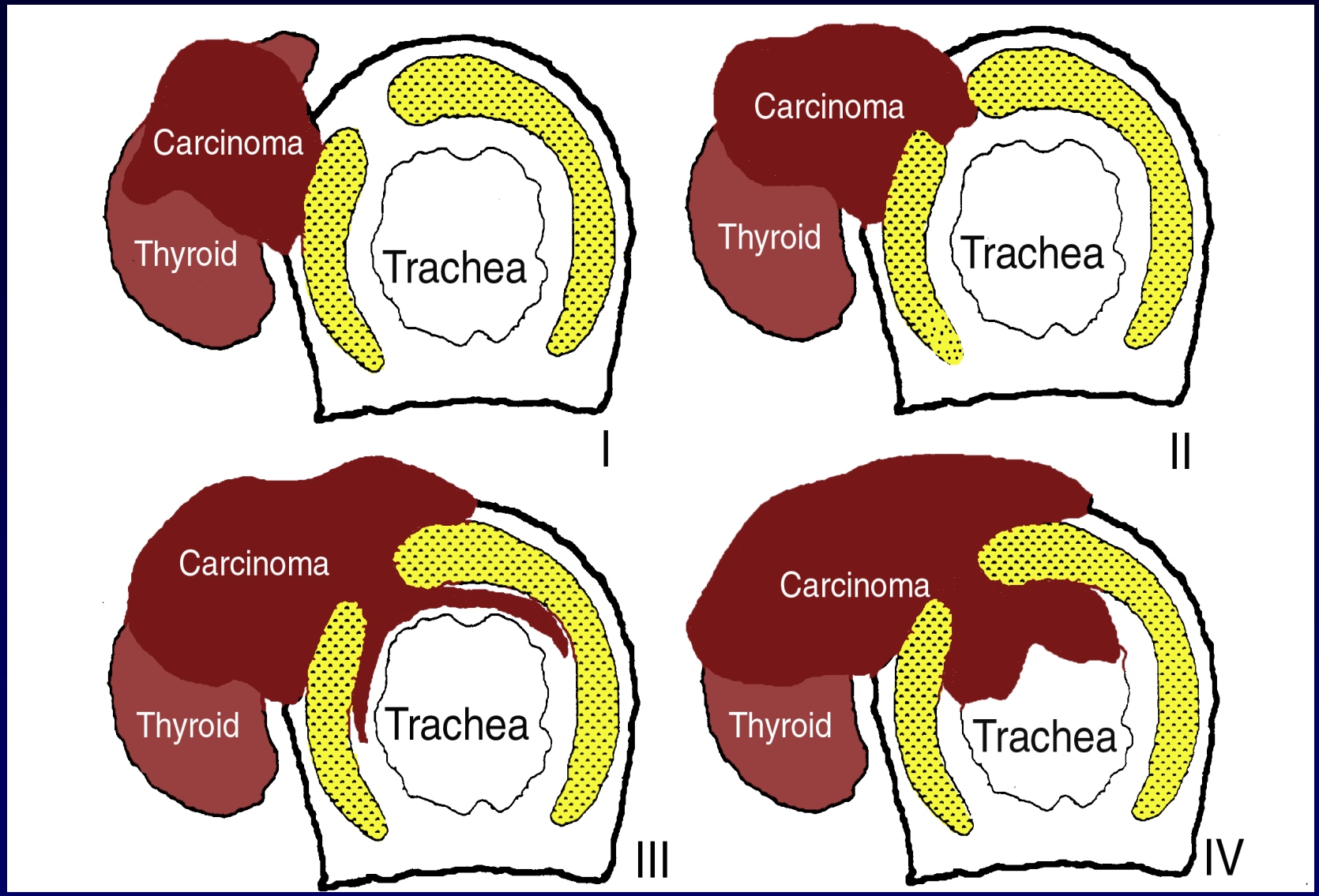


“The fact that total thyroidectomy can be performed safely does not necessarily mean that it is indicated in all patients with thyroid cancer...”

“An operation not worth doing is not worth doing well.”

Collin Thomas
Chapel Hill

Let the punishment fit the crime.

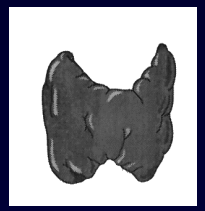


Extent of tracheal involvement

Good judgment comes from experience; and experience comes from bad judgment!

Clinically Negative Intraoperative Management

- Look for TE groove nodes
- Look for sup mediastinal nodes
- Look for jugular nodes
- If any of these enlarged - do the respective clearance
- Central compartment clearance



Clinically Positive Intraoperative Management

- "Berry picking" not recommended, higher incidence of neck recurrence
- Modified neck dissection
- Preserving SCM
  - IJV
  - Accessory nerve
  - Submandibular sal gland (Level I)
- RND - rarely indicated

ATA Guidelines 2015

- Implications of markers
- Less FNA of non-suspicious nodules
- More emphasis on Quality of Life
- Extent of thyroidectomy – lobectomy up to 4cm
- Selective nodal dissection
- Less use of RAI in low risk groups

LESS IS MORE

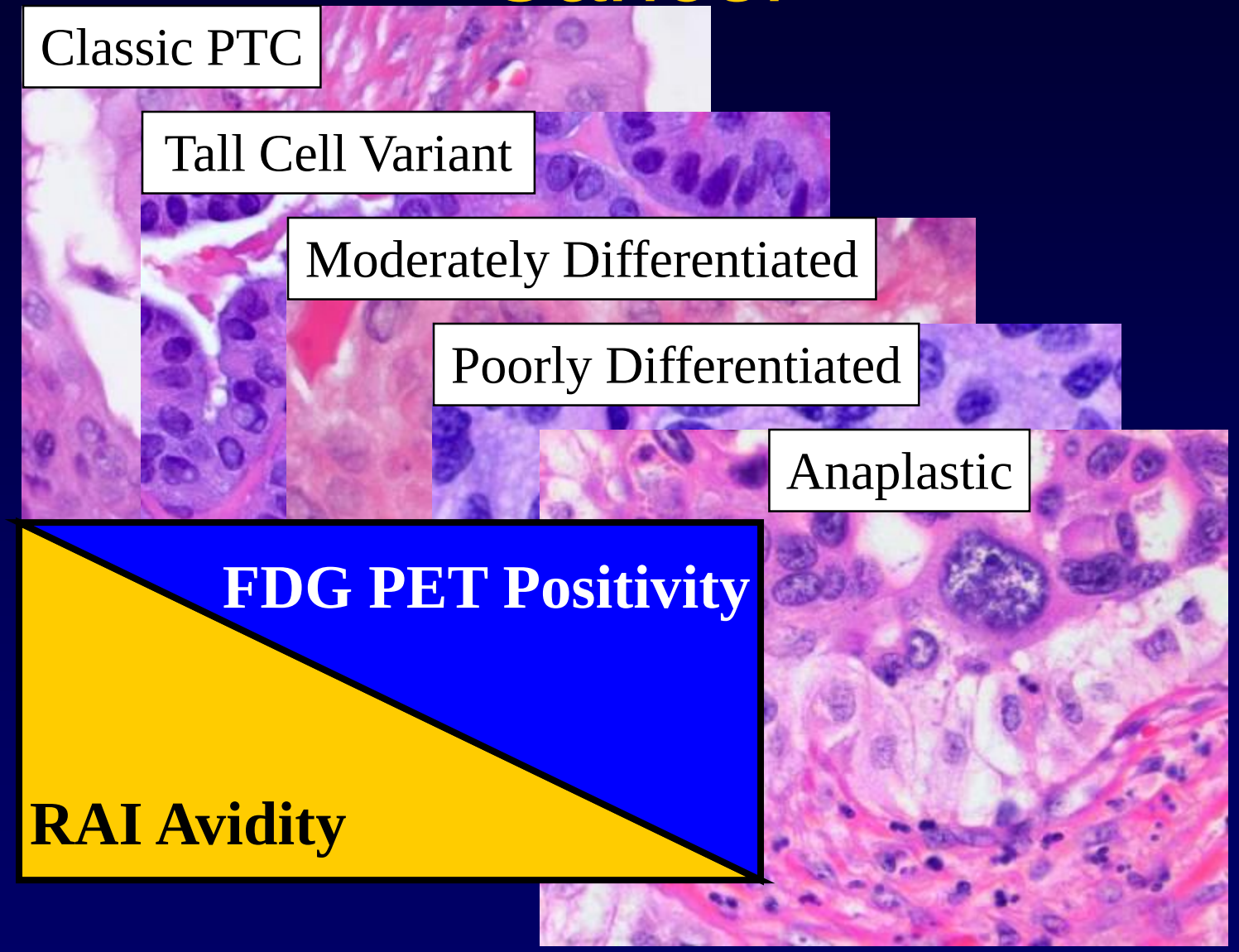
ATA Guidelines 2015 Continued…

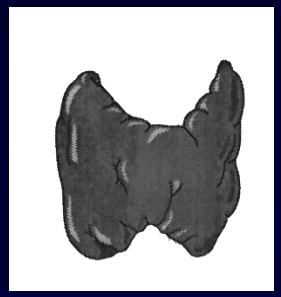
- Voice evaluations
- CT with contrast
- Observations - active surveillance or deferred intervention
- Treatment bases on biology and risk groups

Paradigm Shift in Staging of Thyroid Cancer 2017

- New age classification – 55 yrs
- T- staging – T3a - More than 4cm
  T3b - Anterior extrathyroidal extension
- N- staging – N1a – Central Neck Node
  N1b – Lateral Neck Nodes
  Level VI and VII – group together
- Down grading of approximately 35% patients
- Impact on less use of adjuvant treatment

Continuum of Papillary Thyroid Cancer





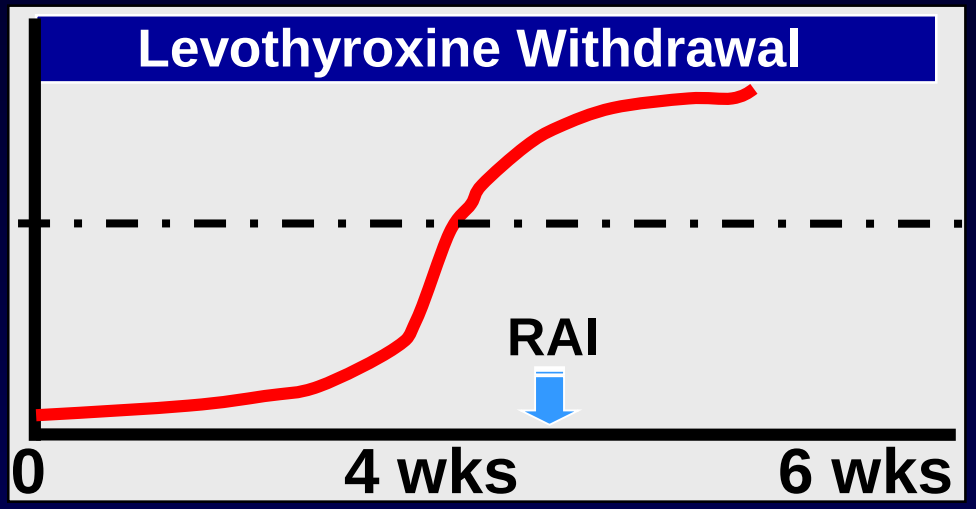
Thyrogen - Recombinant TSH

- No need to make patients hypothyroid
- Can be done post-op/follow-up
- Low iodine diet
- Ease of treating with RAI

MSKCC Experience

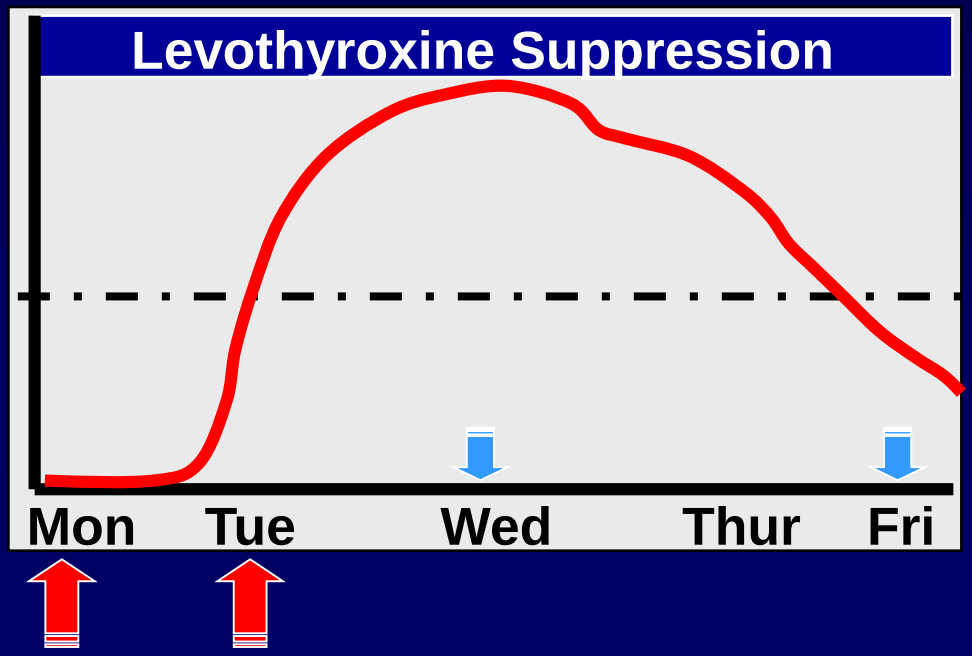
Traditional thyroid hormone withdrawal

(Prior to 1999)



rhTSH Stimulation

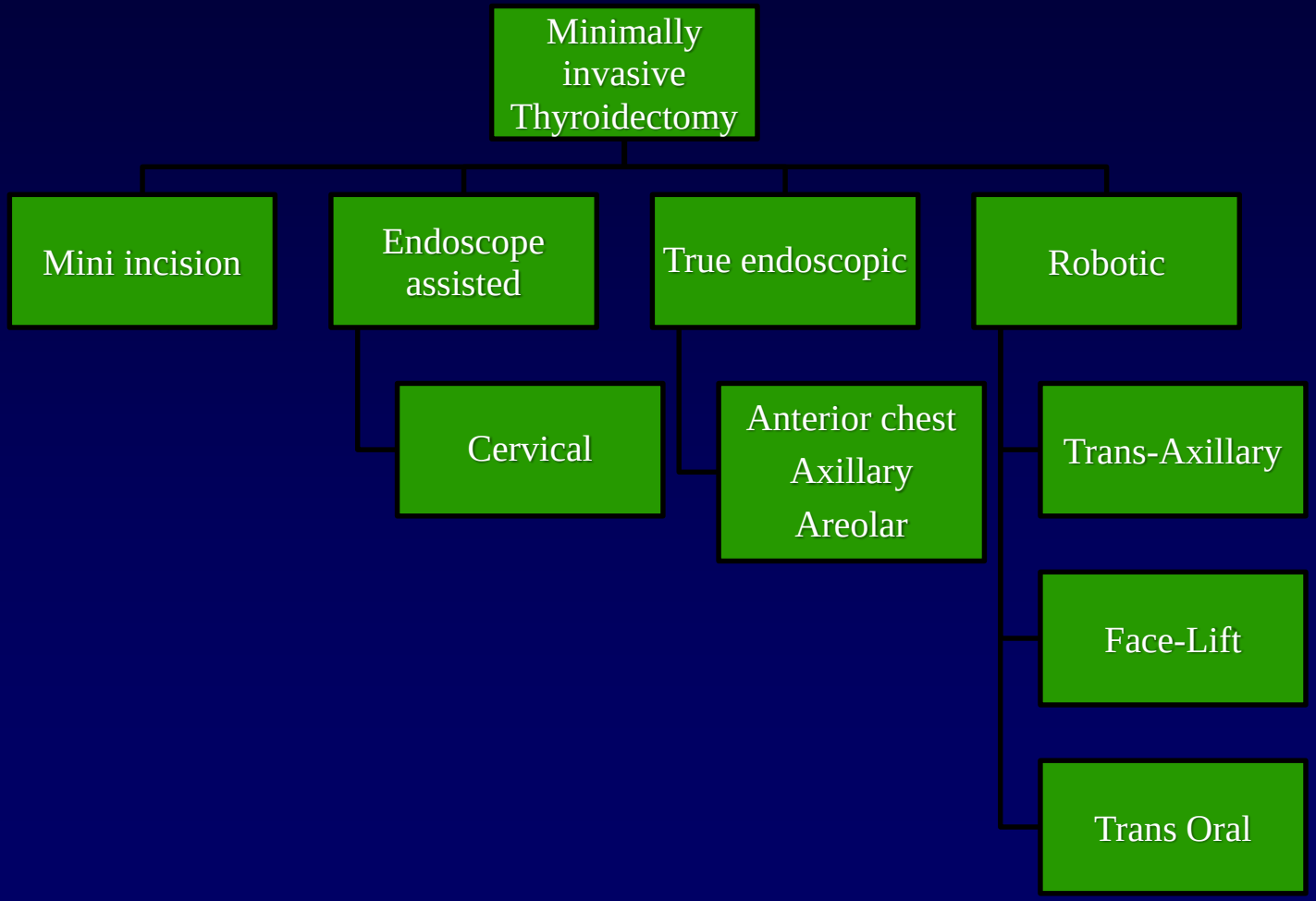
(1999-2000)



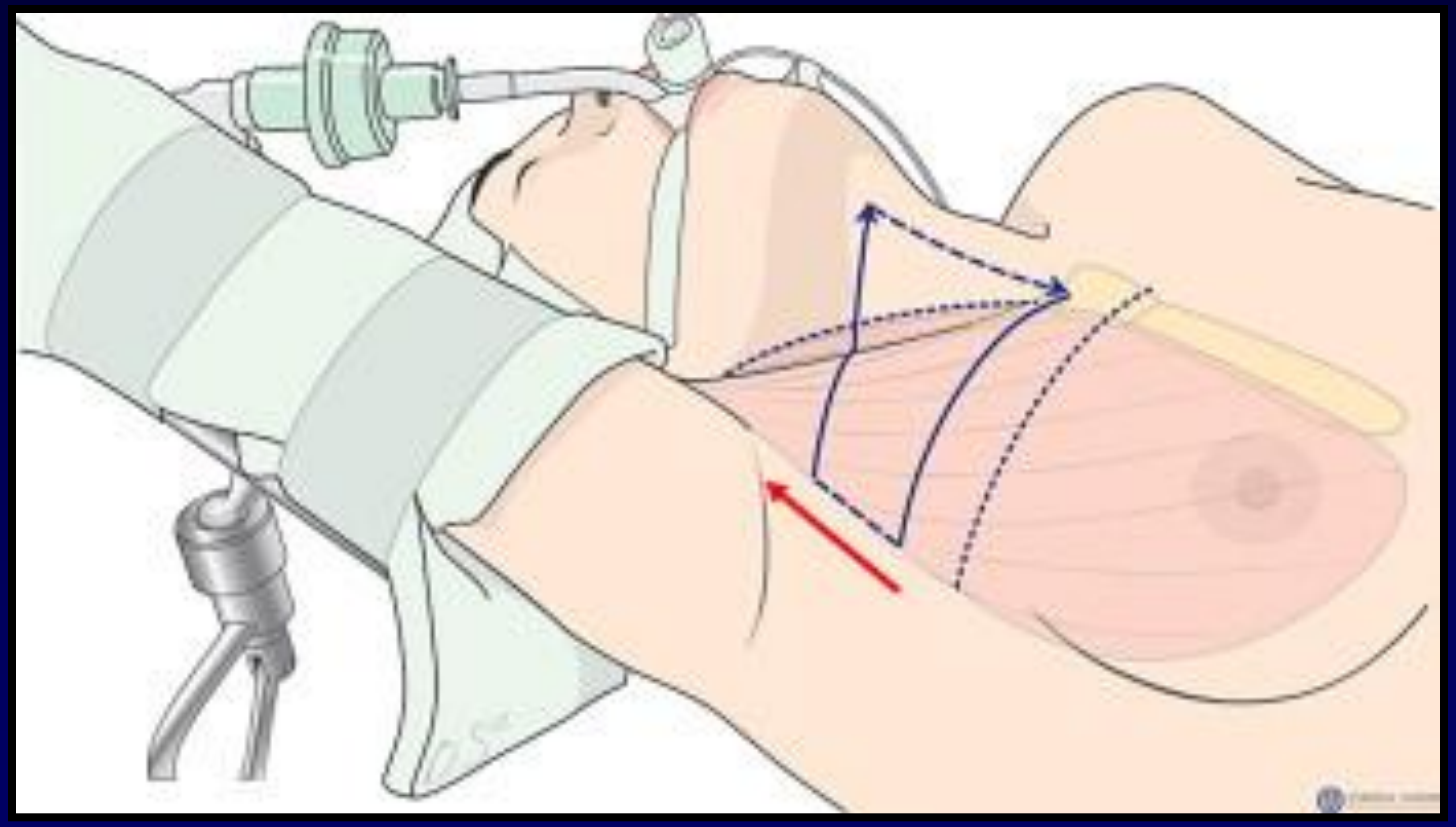
Technology in Thyroid Surgery

- **Harmonic / Ligasure**
- **Nerve Monitor**
- **Endoscopic Thyroidectomy**
- **Robotic Thyroidectomy**

Minimally Invasive Thyroid Surgery



Axillary Incision

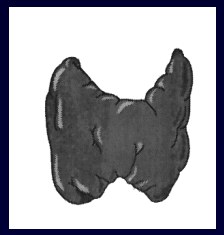


- 6cm axillary incision
- Dissect subcutaneous tunnel over pectoralis major muscle

Transrectal Thyroidectomy

“Modern technology will turn a third class surgeon into a second class one, but will never turn a second class surgeon into a first class one.”

To be a good endoscopic surgeon one needs to be a better open surgeon!

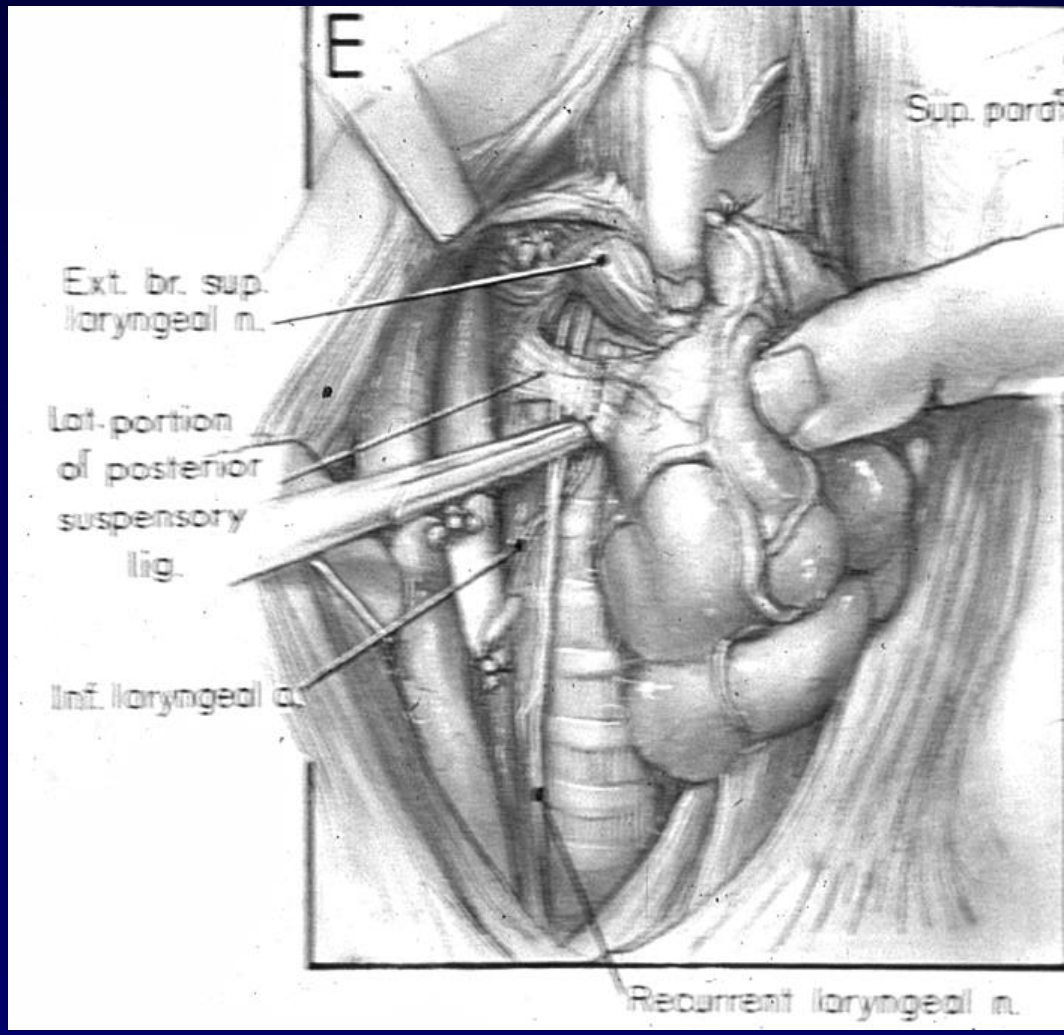


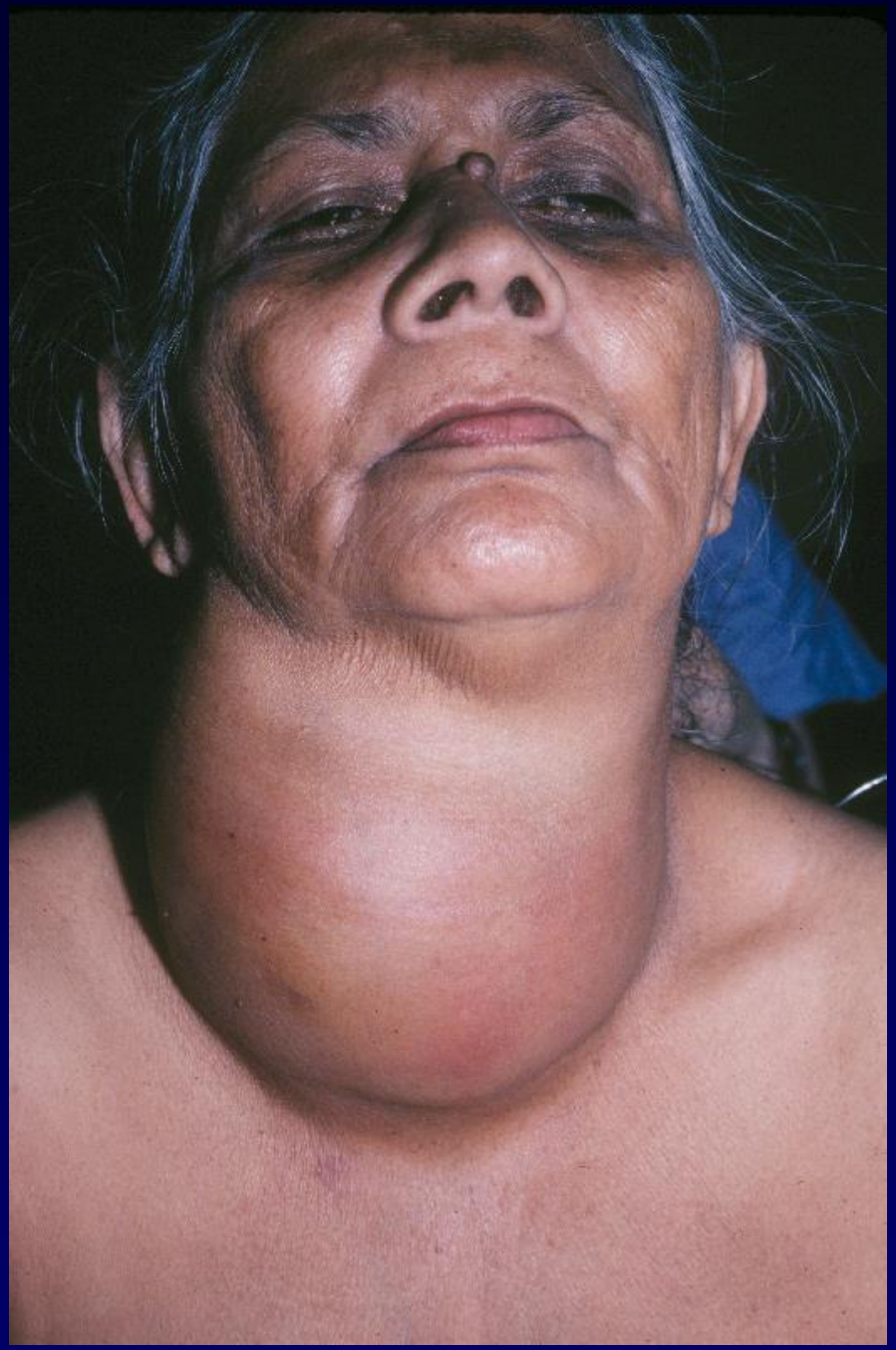
Thyroidectomy

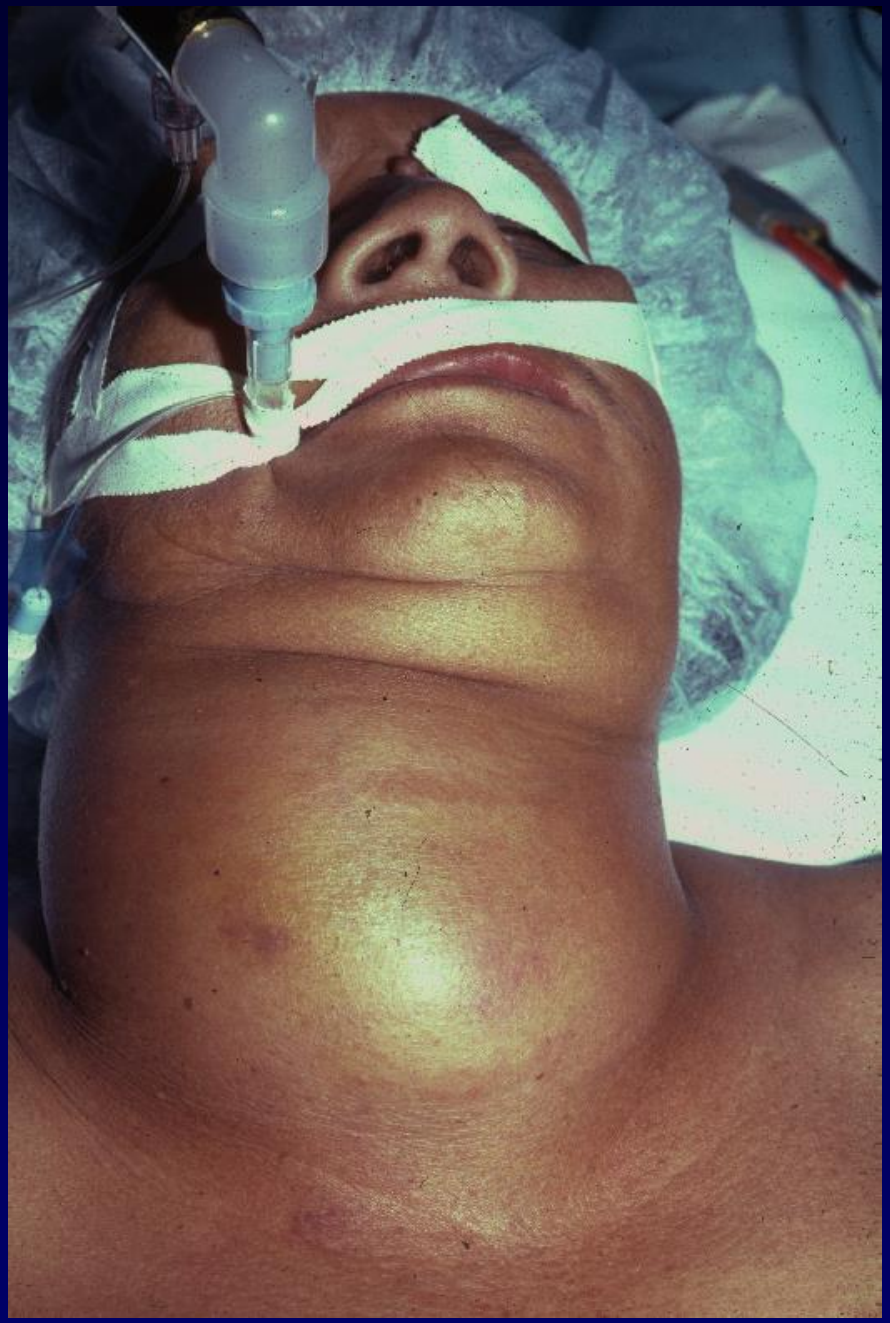
RLN Injury

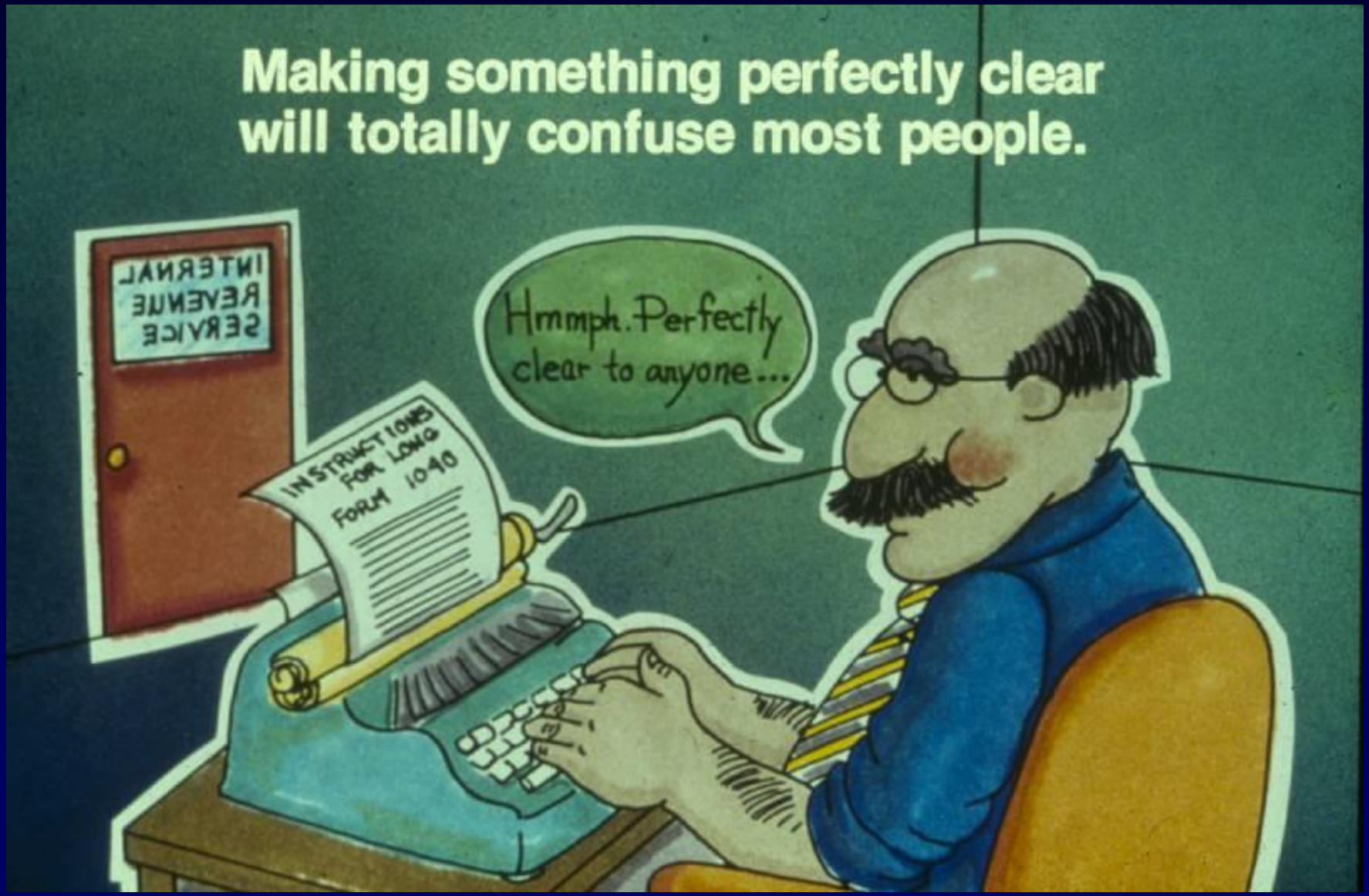
- **In the TE groove (nodal dissection)**
- **At the crossing of the inferior thyroid artery**
- **Near the ligament of Berry – small vessels**

Traversing: Bipolar cautery








Making something perfectly clear will totally confuse most people.
INTERNAL REVENUE SERVICE
Hmmph. Perfectly clear to anyone...
INSTRUCTIONS FOR LONG FORM 1040

Thyroid Cancer

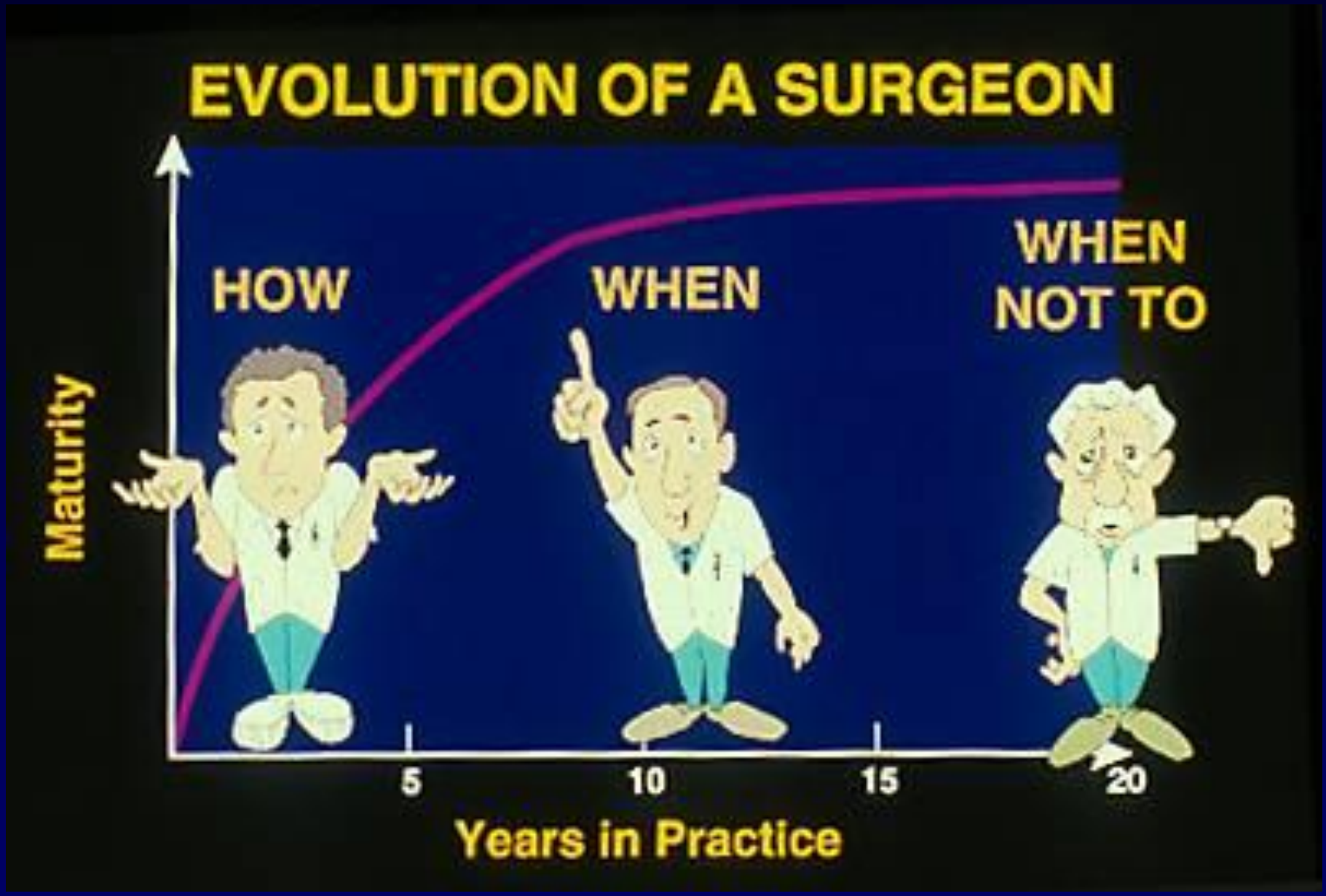
	20 yr survival	Treatment
Good Low	99%	Lobectomy. Appropriate surgery based on extent of disease.
Bad Intermediate	85%	Total thyroidectomy. Select extent of thyroidectomy based on extent of disease. RAI in select cases.
Ugly High	57%	Total thyroidectomy. RAI. Ext RT in selected cases.

“Commonplace clinical problems in surgery are approached in diametrically opposite ways - by surgeons with similar training backgrounds, having read the literature but interpreting the available information differently, based on unique personal experience, vision or surgical prejudice.”

-- Richard Simmons

Multidisciplinary Group

Courtesy Keith Heller, MD



The 4th Stage – when to dump the patient to somebody else

During the difficult part of the operation, step out of the operating room for an emergency phone call or to have an important meeting with the Chairman or visiting professor.

Shaha's Aphorisms

When you don’t know what to do in the operating room, use irrigation.

When you don’t know what to do in the ICU, use steroids.

Shaha’s Aphorisms

Thyroid Cancer

Call: 1-800-ARSHAHA

Or:

1-800-GO SHAHA

ATA Guidelines 2015

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- Extent of thyroidectomy – lobectomy up to 4cm
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ATA Guidelines 2015 Continued…

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Surgical management: thyroid

Extent of surgery	Clinical presentation	Recommendation
Total thyroidectomy	>4 cm Gross extrathyroidal extension (ETE) Positive central and lateral lymph nodes (LN)	strong
Total thyroidectomy or lobectomy	1-4 cm primary (encapsulated, without ETE) No central LN Low risk PTC or FTC	strong
Lobectomy or observation	<1 cm primary tumor	Strong

Difference compared to 2009 guidelines:

In 2009, total thyroidectomy was universally recommended for WDTC > 1 cm

Surgical management: central compartment

Central neck dissection	Situation	Recommendation
No	T1 or T2 primary tumor Noninvasive cancer Central neck negative disease Most follicular thyroid cancers	Strong
Yes	Central neck positive disease	Strong
Consider	T3 or T4 primary tumor cN+ lateral disease or Need for more staging information	Weak

Difference compared to 2009 guidelines

Recommendations more differentiated

Paradigm Shift in Staging of Thyroid Cancer 2017

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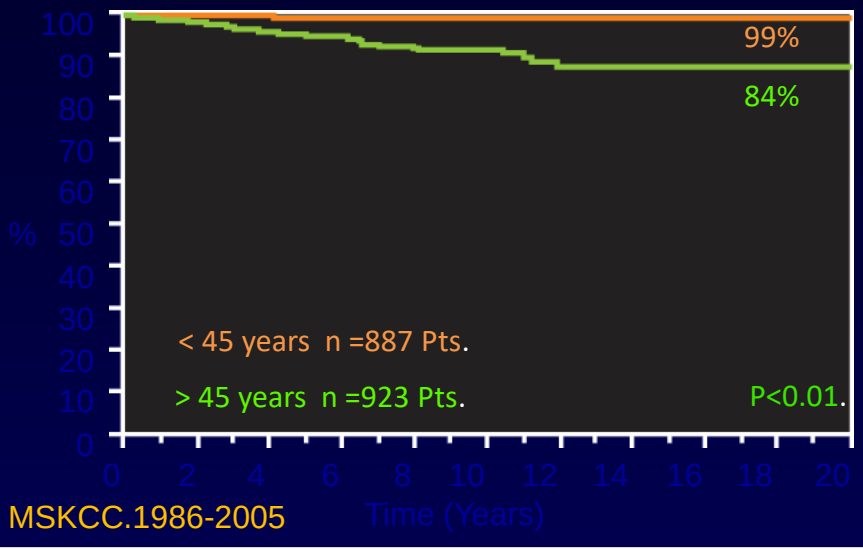
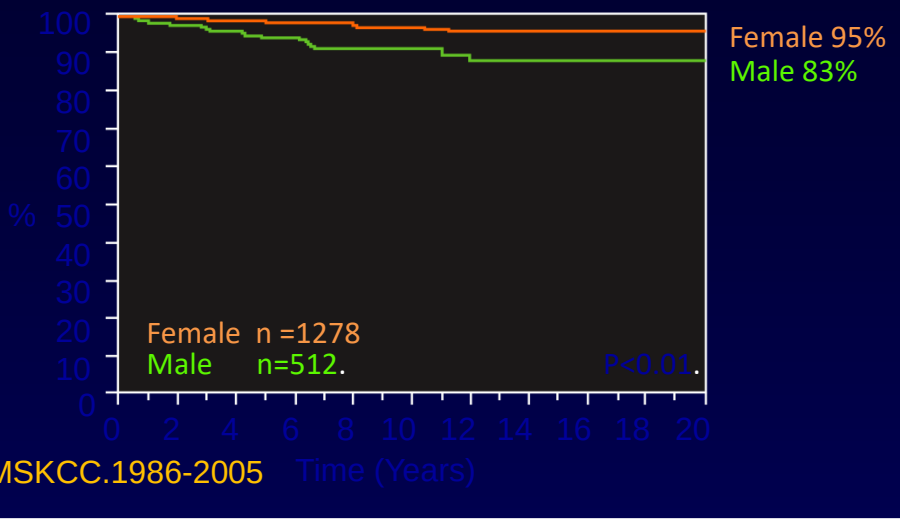
  Level VI and VII – group together
- Down grading of approximately 35% patients
- Impact on less use of adjuvant treatment

Differentiated Carcinoma of the Thyroid
SURVIVAL: Age



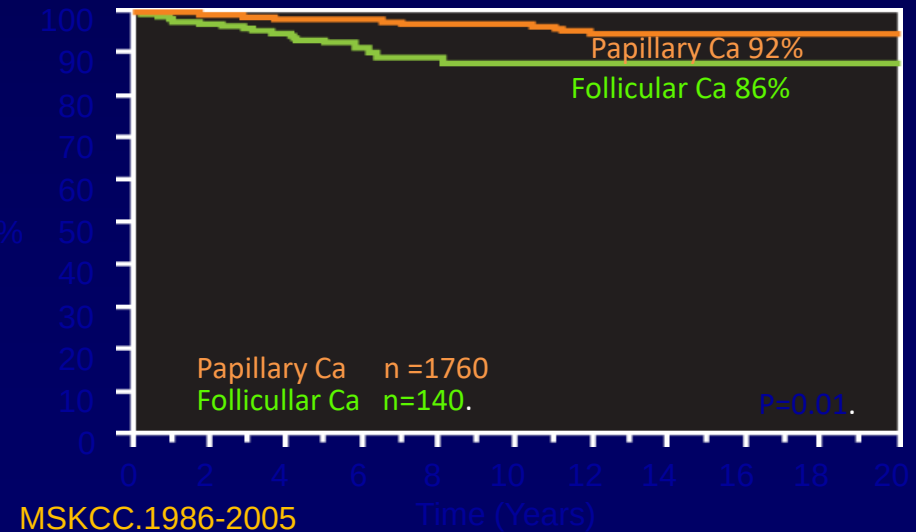
MSKCC.1986-2005

Differentiated Carcinoma of the Thyroid
SURVIVAL: Gender



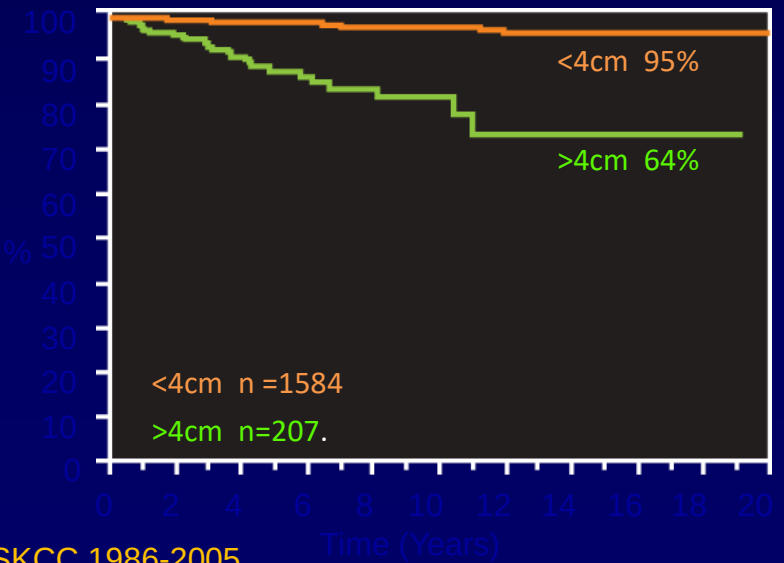
MSKCC.1986-2005

Differentiated Carcinoma of the Thyroid
SURVIVAL: Histology



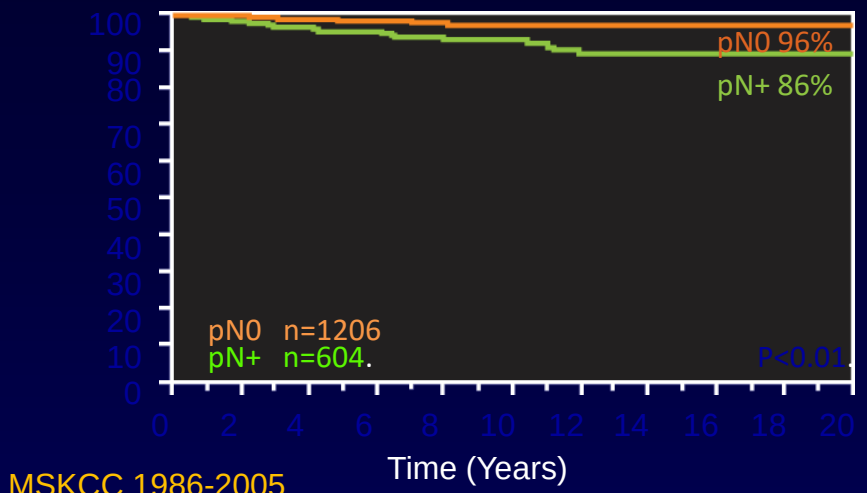
MSKCC.1986-2005

Differentiated Carcinoma of the Thyroid
SURVIVAL: Size



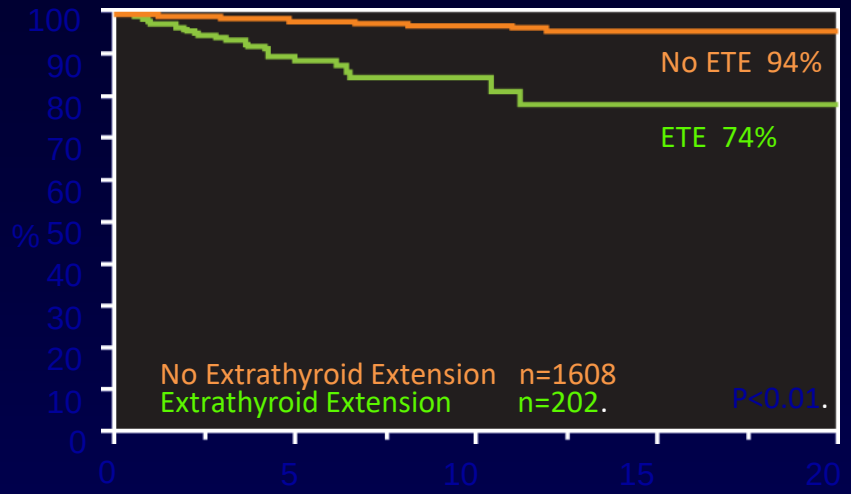
MSKCC.1986-2005

Differentiated Carcinoma of the Thyroid
SURVIVAL: pN Status

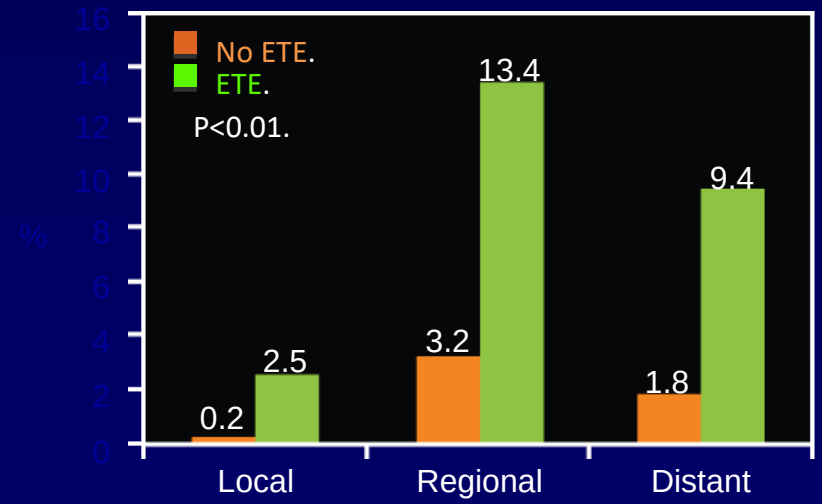


MSKCC 1986-2005

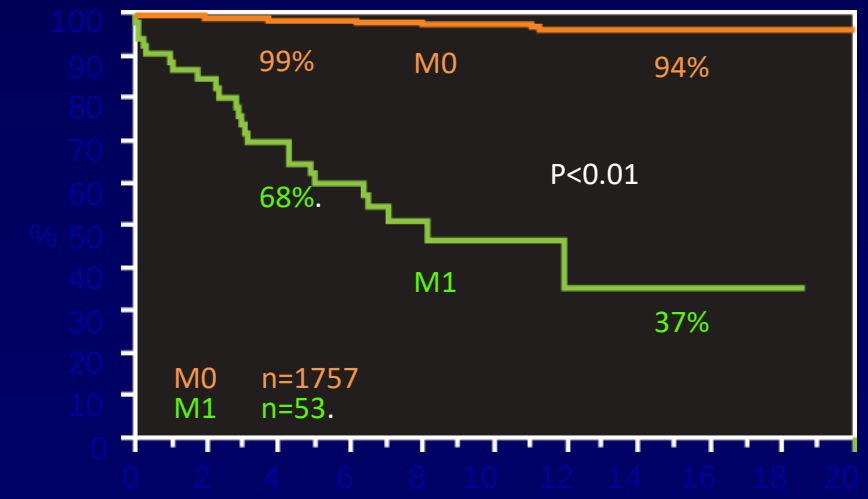
Differentiated Carcinoma of the Thyroid
SURVIVAL: Extrathyroid Extension



Differentiated Carcinoma of the Thyroid
ETE and Recurrence



Differentiated Carcinoma of the Thyroid
SURVIVAL: M Status



MSKCC 1986-2005

Management Guidelines for Patients with Thyroid Nodules and Differentiated Thyroid Cancer

Estimating Risk of Recurrence
2009 Update

Low Risk

Classic PTC
No local or distant mets
Complete resection
No tumor invasion
No vascular invasion
If given, no RAI uptake outside TB

Intermediate Risk

Microscopic ETE
Cervical LN mets
Aggressive Histology
Vascular invasion

High Risk

Macroscopic gross ETE
Incomplete tumor resection
Distant Mets
Inappropriate Tg elevation

Increasing Incidence of Total Thyroidectomy

- Preop U/S showing bilateral nodules
- Preop consultation with Endocrinologist suggesting total and RAI
- Patients perceive fear of recurrence and paper confirmation of negative scan
- Thyroglobulin follow up
- Follow up with repeated U/S showing tiny nodules (Hashimoto's)
- Dr. Google

Minimally Invasive Thyroid Surgery

- Majority of thyroid surgery in the U.S. is performed for proven or suspected malignancy
- Paratracheal and nodal evaluation are difficult
- 20% of patients with thyroid cancer have extrathyroidal extension, which requires adequate exposure and excision
- Ultrasound detecting bilateral thyroid nodules requires total thyroidectomy

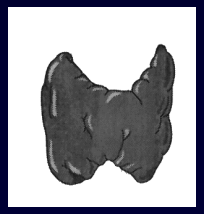
“The decision is more important than the incision.”

“When technology is the Master, the result is Disaster.”

Medical malpractice and the thyroid gland

Lydiatt DD. Head Neck 25:429-431, 2003.

- Jury verdict reviews from 1987-2000 were obtained from a computerized database
- 30 suits from 9 states occurred
- Plaintiffs were women in 80% of the cases, with a mean age of 41
- 50% of pts (15 of 30) had a bad outcome, (9 of 30 dead, 4 of 30 with neurologic deficits, 1 blind & 1 alive w/ cancer)
- 30% alleged surgical complications, most RLN injury, and 75% of cancer pts alleged a delay, either through falsely negative biopsies or no biopsy taken
- Respiratory events occurred in 43% and frequently resulted in large awards



Patients with multiple positive neck nodes from papillary ca may have additional paratracheal, sup mediastinal, or lateral neck nodes, and may remain with persistent mild hyperthyroglobulinemia. We may not achieve biochemical cure.

Shaha, 2004

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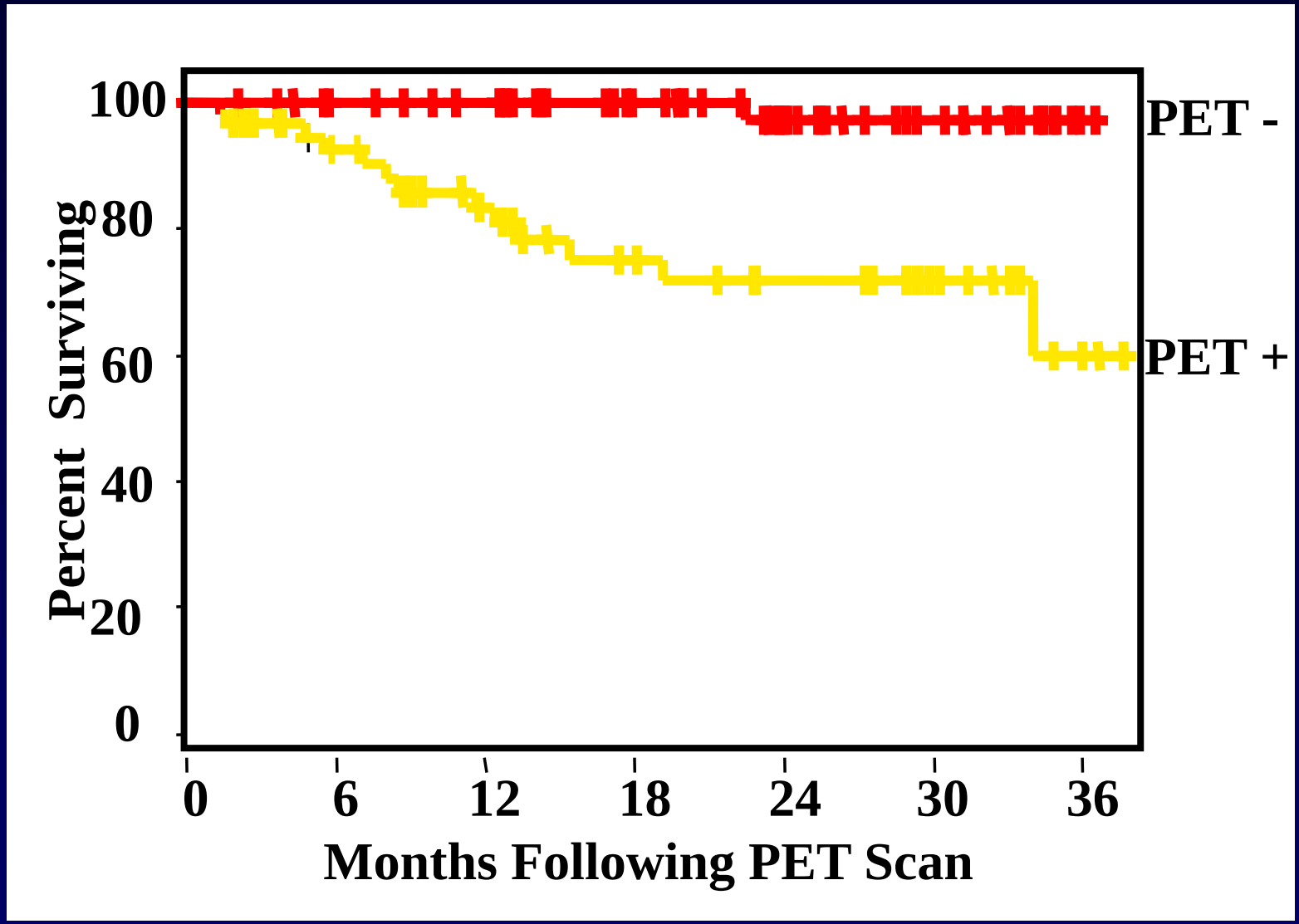
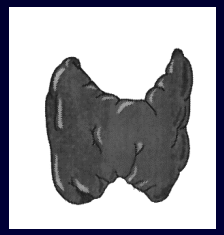
Prognostic Implication of ^{18}FDG PET



n=125 (14 deaths)

Wang et el. JCEM 85:1107-1113, 2000



Post Thyroidectomy Central Compartment Syndrome

- Submental anesthesia/paresthesia
- Vague voice changes
- Chronic throat discomfort
- Swallowing difficulties
- Feeling of choking

(Shaha)

Indications for Total Thyroidectomy

- Grossly palpable disease in both lobes
- High risk patient with high risk tumor
- Radiated patient
- Young patient with large nodal metastasis to facilitate RAI
- Patient with distant metastasis likely to require RAI

Elective ND
Radical ND

U/S & U/S FNA
No clinical finding
Rising TGB

No prognostic implication

Thyroglobulin follow-up

Only therapeutic ND

Clinical follow-up

Central compartment ND