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\textit{What does it mean to say Graves is associated with thyroid dz, but not caused by it?}
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Thyroid eye dz (TED) is an autoimmune dz. Research suggests that, moreso than those elsewhere in the body, orbital cells are highly sensitive to circulating TSH-receptor antibodies (TSH-R Ab)--the same circulating antibodies implicated in many forms of autoimmune thyroid disease.
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Stimulation of orbital fibroblasts by TSH-R Ab has what effects on these cells?
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Stimulation of orbital fibroblasts by TSH-R Ab has what effects on these cells?

It induces them to secrete glycosaminoglycans (GAGs), as well as pro-inflammatory cytokines (which attract inflammatory cells to the orbit). Stimulation even causes some fibroblasts to differentiate into adipocytes. Thus, much of the histopathology of TED (ie, an orbit full of ground substance, inflammatory cells, etc) can be traced directly to the effects of TSH-R Ab on orbital fibroblasts.
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But to the original question: Note that the above activities are not caused by what’s going on in the thyroid gland itself. Thus, while TED often coincides with thyroid dysfunction, it does not result from it.
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Speaking of thyroid dysfunction... Is Graves more likely to be associated with hyperthyroidism, or hypothyroidism?
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What percent of Graves cases are associated with hyperthyroidism at presentation?
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**Speaking of thyroid dysfunction…Is Graves more likely to be associated with hyperthyroidism, or hypothyroidism?**

Hyperthyroidism

**What percent of Graves cases are associated with hyperthyroidism at presentation?**

About 90

**Graves aka Thyroid Eye Disease: True/False**

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Speaking of thyroid dysfunction…Is Graves more likely to be associated with hyperthyroidism, or hypothyroidism?

Hyperthyroidism

Can Graves dz present in association with euthyroid status?

About 90

What percent of Graves cases are associated with hyperthyroidism at presentation?

About 90

What proportion of Graves pts are euthyroid at presentation?

About 6%

Of the euthyroid presentations, what percent will develop thyroid disease over the next 5 years?

About half
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What proportion of Graves pts are euthyroid at presentation?
About 6%

Of the remaining 94%, what percent will develop thyroid disease over the next 5 years?
About half

Can Graves dz present in association with hypothyroidism?
Yes—the remaining 4% are hypothyroid

Most of these pts have a specific condition—what is it?
Hashimoto's thyroiditis
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Yes, albeit uncommonly

What proportion of Graves pts are euthyroid at presentation?

About 6%

Can Graves dz present in association with hypothyroidism?

Yes—the remaining 4% are hypothyroid

Of the hypothyroid Graves pts, what specific condition do the majority have?

Hashimoto's thyroiditis
Graves orbitopathy is secondary to thyroid disease
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Speaking of thyroid dysfunction…Is Graves more likely to be associated with hyperthyroidism, or hypothyroidism?
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Yes, albeit uncommonly

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Is Graves more likely to be associated with hyperthyroidism, or hypothyroidism?
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**What percent of Graves cases are associated with hyperthyroidism at presentation?**
- About 90

**Can Graves dz present in association with euthyroid status?**
- Yes, albeit uncommonly

**What proportion of Graves pts are euthyroid at presentation?**
- About 6%

**Of the euthyroid presentations, what percent will develop thyroid disease over the next 5 years?**
- About half

**Can Graves dz present in association with hypothyroidism?**
- Yes—the remaining 4% are hypothyroid

**Most of these pts have a specific condition—what is it?**
- Hashimoto’s thyroiditis
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Graves is aggravated by smoking
Graves orbitopathy is secondary to thyroid disease

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Graves is aggravated by smoking  True; Graves patients should be urged to stop smoking
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*Smoking increases the likelihood of developing TED by how much?*
Graves aka Thyroid Eye Disease: True/False

- Graves orbitopathy is secondary to thyroid disease
  Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it

- **Graves is aggravated by smoking** True; Graves patients should be urged to stop smoking

  *Smoking increases the likelihood of developing TED by how much?*
  A smoker is 7x more likely to develop TED than a nonsmoker!
Graves orbitopathy is secondary to thyroid disease
Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it

Graves is aggravated by smoking True; Graves patients should be urged to stop smoking

Graves is associated with MS (multiple sclerosis)
Graves orbitopathy is secondary to thyroid disease
Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it

Graves is aggravated by smoking  True; Graves patients should be urged to stop smoking

Graves is associated with MS  False; it is associated with MS

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Graves is aggravated by smoking True; Graves patients should be urged to stop smoking
Graves is associated with MS False; it is associated with MG
Graves orbitopathy is secondary to thyroid disease: 
Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.

Graves is aggravated by smoking: True; Graves patients should be urged to stop smoking.

Graves is associated with MS: False; it is associated with **MG**.

*What does MG stand for in this context?*
Graves orbitopathy is secondary to thyroid disease. Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.

Graves is aggravated by smoking. True; Graves patients should be urged to stop smoking.

Graves is associated with MS. False; it is associated with MG.

What does MG stand for in this context? Myasthenia gravis.
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Graves is associated with MS  False; it is associated with MG.

Graves myopathy usually results in an ET and/or a hypotropia.
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Graves myopathy usually results in an ET and/or a hypotropia True
Graves *aka* Thyroid Eye Disease: True/False

- Esotropia
- Hypotropia

TED: Strabismus
Graves orbitopathy is secondary to thyroid disease
Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.

- Graves is aggravated by smoking: True; Graves patients should be urged to stop smoking.
- Graves is associated with MS: False; it is associated with MG.
- Graves myopathy usually results in an ET and/or a hypotropia: True.
- The medial rectus is more likely than the inferior rectus to be affected.
Graves orbitopathy is secondary to thyroid disease
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Graves is aggravated by smoking  True; Graves patients should be urged to stop smoking.

Graves is associated with MS  False; it is associated with MG.

Graves myopathy usually results in an ET and/or a hypotropia  True.

The medial rectus is more likely than the inferior rectus to be affected  False; the order (most to least likely) is (all 4 rectus muscles).
Graves orbitopathy is secondary to thyroid disease
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Graves is aggravated by smoking  True; Graves patients should be urged to stop smoking

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Graves myopathy usually results in an ET and/or a hypotropia  True

The medial rectus is more likely than the inferior rectus to be affected  False; the order (most to least likely) is IR>MR>SR>LR
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Men and women are at equal risk of TED
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Men and women are at equal risk of TED Nope.
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Men and women are at equal risk of TED Nope

**Graves aka Thyroid Eye Disease: True/False**

- **M vs F: Who is at higher risk for developing TED?**
  - Women are 6x more likely to develop TED than men.
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Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.

- Graves is aggravated by smoking. True; Graves patients should be urged to stop smoking.
- Graves is associated with MS. False; it is associated with MG.
- Graves myopathy usually results in an ET and/or a hypotropia. True.
- The medial rectus is more likely than the inferior rectus to be affected (most to least likely) is MR > IR > SR > LR.

Men and women are at equal risk of TED. Nope.
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The medial rectus is more likely than the inferior rectus to be affected (most to least likely) False; the order (most to least likely) is IR>MR>SR>LR

Men and women are at equal risk of TED Nope

M vs F: Who is at higher risk for developing TED? Women

How much higher is the risk for women?
Graves orbitopathy is secondary to thyroid disease
Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it

Graves is aggravated by smoking  True; Graves patients should be urged to stop smoking

Graves is associated with MS  False; it is associated with MG

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The medial rectus is more likely than the inferior rectus to be affected (most to least likely) is

Men and women are at equal risk of TED  Nope
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- The medial rectus is more likely than the inferior rectus to be affected  False; the order (most to least likely) is IR>MR>SR>LR
- Men and women are at equal risk of TED  Nope

What is/are the diagnostic criteria for TED?

Pt must have at least two of the following:
- Autoimmune thyroid dz
- Typical orbital signs of TED
- Imaging findings c/w TED

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- Men and women are at equal risk of TED  Nope

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- Men and women are at equal risk of TED: Nope.

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- Typical orbital signs of TED
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- Men and women are at equal risk of TED Nope

What is/are the diagnostic criteria for TED? Pt must have at least two of the following:

- Autoimmune thyroid dz
- Typical orbital signs of TED
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How is this defined?

Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies

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- **Autoimmune thyroid dz**
- Typical orbital signs of TED
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How is this defined?
Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies

What are the typical orbital signs?
- Eyelid retraction
- Proptosis
- Restrictive strabismus (in a manner c/w TED myopathy)
- Compressive optic neuropathy
- Edema of the lids and/or conj

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**Graves aka Thyroid Eye Disease: True/False**

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- Autoimmune thyroid dz
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Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies.

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- Eyelid retraction
- Proptosis
- Restrictive strabismus (in a manner c/w TED myopathy)
- Compressive optic neuropathy
- Edema of the lids and/or conj (ie, chemosis)

*Is the eyelid retraction unilateral, or bilateral?*

'Temporal flare' refers to the fact that the retraction is more pronounced at the temporal aspect of the lid.

*What are the diagnostic criteria for TED?* Pt must have at least two of the following:

- Autoimmune thyroid dz
- Typical orbital signs of TED
- Imaging findings c/w TED
Graves orbitopathy is secondary to thyroid disease. Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.

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Graves myopathy usually results in an ET and/or a hypotropia. True.

The medial rectus is more likely than the inferior rectus to be affected. False; the order (most to least likely) is IR>MR>SR>LR.

Men and women are at equal risk of TED. Nope.

### Graves aka Thyroid Eye Disease: True/False

<table>
<thead>
<tr>
<th>Question</th>
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Graves *aka* Thyroid Eye Disease: True/False

TED: Lid retraction

*Unilateral*

*Bilateral*

*Or highly asymmetric, at least*
Graves *aka* Thyroid Eye Disease: True/False

**What is/are the diagnostic criteria for TED?** Pt must have at least two of the following:

- Autoimmune thyroid dz
- Typical orbital signs of TED
- Imaging findings c/w TED

**Sort of, but not really.** Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.

- Graves is aggravated by smoking  True; Graves patients should be urged to stop smoking
- Graves is associated with MS  False; it is associated with MG
- Graves myopathy usually results in an ET and/or a hypotropia  True
- The medial rectus is more likely than the inferior rectus to be affected  False; the order (most to least likely) is IR>MR>SR>LR
- Men and women are at equal risk of TED  Nope

---

**How is this defined?**

Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies.

**What are the typical orbital signs?**

- Eyelid retraction
- Proptosis
- Restrictive strabismus (in a manner c/w TED myopathy)
- Compressive optic neuropathy
- Edema of the lids and/or conj (ie, chemosis)

**Is the eyelid retraction unilateral, or bilateral?**

It can be either

**TED is characterized by a particular pattern of retraction--what is it?**

'Temporal flare'

What does *temporal flare* refer to/mean?

The fact that the retraction is more pronounced at the temporal aspect of the lid.
Graves orbitopathy is secondary to thyroid disease. 

- Graves is aggravated by smoking  True; Graves patients should be urged to stop smoking.
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Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies.

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Men and women are at equal risk of TED. Nope.

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Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies.

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Is the eyelid retraction unilateral, or bilateral?
It can be either.

TED is characterized by a particular pattern of retraction--what is it?
‘Temporal flare’

What does temporal flare refer to/mean?
The fact that the retraction is more pronounced at the temporal aspect of the lid.
Graves *aka* Thyroid Eye Disease: True/False

TED: Lid retraction with temporal flare
Graves *aka* Thyroid Eye Disease: True/False

**What is/are the diagnostic criteria for TED?** Pt must have at least two of the following:
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**How is this defined?**
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**Is the eyelid retraction unilateral, or bilateral?** It can be either.

**TED is characterized by a particular pattern of retraction—what is it?**
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**What does temporal flare refer to/mean?**
The fact that the retraction is more pronounced at the temporal aspect of the lid.

**There is an important exception to the ‘absence of lid retraction indicates it isn’t Graves dz’ contention—in fact, such pts can present with ptosis.** Under what circumstance might a Graves pt present with no lid retraction, or even frank ptosis?
Graves aka Thyroid Eye Disease: True/False

Q/A

What is/are the diagnostic criteria for TED? Pt must have at least two of the following:

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Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it caused by smoking. True; Graves patients should be urged to stop smoking.

- Graves is associated with MS False; it is associated with MG
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What are the typical orbital signs?
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What one word best characterizes the clinical course of ptosis in MG?
Variable. That is, one would expect the degree of ptosis to vary from exam to exam.

Graves...
Graves aka Thyroid Eye Disease: True/False

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What are the typical orbital signs?
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Is the eyelid retraction unilateral, or bilateral? It can be either

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Is the proptosis unilateral, or bilateral?

It can be either

Where does TED rank as a cause of unilateral proptosis in adults?

#1

Where does TED rank as a cause of bilateral proptosis in adults?

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- Men and women are at equal risk of TED Nope

Graves is secondary to thyroid disease

Pt must have at least two of the following:

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TED: Proptosis

*Or highly asymmetric, at least*
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**Is the proptosis unilateral, or bilateral?** It can be either.

**Where does TED rank as a cause of unilateral proptosis in adults?** #1

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What about in the pediatric population--is the relationship between proptosis and Graves dz as strong?
No. Graves is rare in children, and when it does occur, only about 10% of pts present with proptosis. (Rule of thumb: In children, proptosis is more likely to be infectious or neoplastic than to be inflammatory.)

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- Edema of the lids and/or conj (ie, chemosis)

What does this mean, ‘in a manner c/w TED myopathy’?

Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it

- Graves is aggravated by smoking True; Graves patients should be urged to stop smoking
- Graves is associated with MS False; it is associated with MG
- Graves myopathy usually results in ET and/or a hypotropia True
- The medial rectus is more likely than the inferior rectus to be affected False; the order (most to least likely) is IR>MRI>SRI>LR
- Men and women are at equal risk of TED Nope
Graves orbitopathy is secondary to thyroid disease. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.

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The medial rectus is more likely than the inferior rectus to be affected. False; the order (most to least likely) is IR > MR > SR > LR.

Men and women are at equal risk for TED. Nope.

How is this defined? Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies.

What are the typical orbital signs? --Eyelid retraction --Proptosis --Restrictive strabismus (in a manner c/w TED myopathy) --Compressive optic neuropathy --Edema of the lids and/or conj (ie, chemosis)

What does this mean, 'in a manner c/w TED myopathy'? It means in this order:

What are the diagnostic criteria for TED? Pt must have at least two of the following: Autoimmune thyroid dz Typical orbital signs of TED Imaging findings c/w TED

Graves aka Thyroid Eye Disease: True/False

75
Graves orbitopathy is secondary to thyroid disease. Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.

- Graves is aggravated by smoking: True; Graves patients should be urged to stop smoking.
- Graves is associated with MS: False; it is associated with MG.
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- The medial rectus is more likely than the inferior rectus to be affected: False; the order (most to least likely) is IR>MR>SR>LR.
- Men and women are at equal risk of TED: Nope.

**Graves aka Thyroid Eye Disease: True/False**

**What is/are the diagnostic criteria for TED?**
- Pt must have at least two of the following:
  - Autoimmune thyroid dz
  - Typical orbital signs of TED
  - Imaging findings c/w TED

**Which of these is the most common orbital sign in TED?**
- Lid retraction

**What are the typical orbital signs?**
- Eyelid retraction
- Proptosis
- Restrictive strabismus (in a manner c/w TED myopathy)
- Compressive optic neuropathy
- Edema of the lids and/or conj (ie, chemosis)
Graves orbitopathy is secondary to thyroid disease. Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.

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- Men and women are at equal risk of TED. Nope.

**What is/are the diagnostic criteria for TED?**

Pt must have at least two of the following:

- Autoimmune thyroid dz
- Typical orbital signs of TED
- Imaging findings c/w TED

**How is this defined?**

Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies.

**What percent of TED pts will demonstrate lid retraction at presentation?**

About 75%

**What percent will demonstrate it at some point during the disease process?**

Over 90%

**What are the typical orbital signs?**

--Eyelid retraction
--Proptosis
--Restrictive strabismus (in a manner c/w TED myopathy)
--Compressive optic neuropathy
--Edema of the lids and/or conj (ie, chemosis)

**Graves aka Thyroid Eye Disease: True/False**

- True/False: Graves is Thyroid Eye Disease: True/False: True

- True/False: Graves is an autoimmune disease: True

- True/False: Graves is aggravated by smoking: True

- True/False: Graves is associated with MS: False

- True/False: Graves myopathy usually results in an ET and/or a hypotropia: True

- True/False: The medial rectus is more likely than the inferior rectus to be affected: False

- True/False: Men and women are at equal risk of TED: False
Graves aka Thyroid Eye Disease: True/False

**What is/are the diagnostic criteria for TED?** Pt must have at least two of the following:
- Autoimmune thyroid dz

**Typical orbital signs of TED**
- Eyelid retraction
- Proptosis
- Restrictive strabismus (in a manner c/w TED myopathy)
- Compressive optic neuropathy
- Edema of the lids and/or conj (ie, chemosis)

**Imaging findings c/w TED**

**Which of these is the most common orbital sign in TED?**
- Lid retraction

**What percent of TED pts will demonstrate lid retraction at presentation?**
- About 75%
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**What are the typical orbital signs?**
- Eyelid retraction
- Proptosis
- Restrictive strabismus (in a manner c/w TED myopathy)
- Compressive optic neuropathy
- Edema of the lids and/or conj (ie, chemosis)

**Graves is/are:**
- Thyroid Eye Disease: True/False

**Sort of, but not really.** Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.

**Graves is aggravated by smoking?** True; Graves patients should be urged to stop smoking.

**Graves is associated with MS?** False; it is associated with MG.

**Graves myopathy usually results in an ET and/or a hypotropia?** True

**The medial rectus is more likely than the inferior rectus to be affected?** False; the order (most to least likely) is IR>MRI>SRI>LR.

**Men and women are at equal risk of TED?** Nope.
Graves aka Thyroid Eye Disease: True/False

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- Typical orbital signs of TED
- Imaging findings c/w TED

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- Edema of the lids and/or conj (ie, chemosis)
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What is/are the diagnostic criteria for TED? Pt must have at least two of the following:
- Autoimmune thyroid dz

Typical orbital signs of TED
- Lid retraction
- Proptosis
- Restrictive strabismus (in a manner c/w TED myopathy)
- Compressive optic neuropathy
- Edema of the lids and/or conj (ie, chemosis)

Imaging findings c/w TED

Which of these is the most common orbital sign in TED?
- Lid retraction

What percent of TED pts will demonstrate lid retraction at presentation?
- About 75

What percent will demonstrate it at some point during the disease process?
- Over 90

How is this defined?
- Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies.

80
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The medial rectus is more likely than the inferior rectus to be affected. False; the order (most to least likely) is IR>MRI>SRI>LR.

Men and women are at equal risk of TED. Nope.

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Graves aka Thyroid Eye Disease: True/False

*What is/are the diagnostic criteria for TED?* Pt must have at least two of the following:
- Autoimmune thyroid dz

*Typical orbital signs of TED*

- Lid retraction
- Proptosis
- Restrictive strabismus (in a manner c/w TED myopathy)
- Compressive optic neuropathy
- Edema of the lids and/or conj (ie, chemosis)

*Imaging findings c/w TED*

*Which of these is the most common orbital sign in TED?*
- Lid retraction

*What percent of TED pts will demonstrate lid retraction at presentation?*
- About 75

*What percent will demonstrate it at some point during the disease process?*
- Over 90

---

How is this defined?
Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies.
Graves orbitopathy is secondary to thyroid disease

- Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.
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- Men and women are at equal risk of TED. Nope.

**Graves aka Thyroid Eye Disease: True/False**

What is/are the diagnostic criteria for TED? Pt must have at least two of the following:
- Autoimmune thyroid dz
- Typical orbital signs of TED
- Imaging findings c/w TED

How is this defined?
Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies.

What are the typical orbital signs?
- Eye lid retraction
- Proptosis
- Limitations of downgaze
- Convergence insufficiency

In the present context, to what does the term lid lag refer?

When a person who doesn’t have TED moves into downgaze, their upper lid margin will follow the globe. In contrast, when a TED pt looks down, their upper lid remains elevated, ie, it ‘lags.’ This is a classic TED finding.

What is the eponymous name for lid lag?
von Graefe’s sign
Graves orbitopathy is secondary to thyroid disease. Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it. Graves is aggravated by smoking. True; Graves patients should be urged to stop smoking.

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- Men and women are at equal risk of TED. Nope.

What is/are the diagnostic criteria for TED? Pt must have at least two of the following:

- Autoimmune thyroid dz
- Typical orbital signs of TED
- Imaging findings c/w TED

How is this defined? Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies.

What are the typical orbital signs?

- Eyelid retraction
- Proptosis
- Compressive optic neuropathy
- Edema of the lids and/or conj (ie, chemosis)

In the present context, to what does the term lid lag refer? When a person who *doesn’t* have TED moves into downgaze, their upper lid margin will follow the globe. In contrast, when a TED pt looks down, their upper lid remains elevated, ie, it ‘lags.’ This is a classic TED finding.

Graves aka Thyroid Eye Disease: True/False
Graves *aka* Thyroid Eye Disease: True/False

TED: Lid lag

*Or highly asymmetric, at least*
Graves orbitopathy is secondary to thyroid disease. 

- Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.
- Graves is aggravated by smoking. True; Graves patients should be urged to stop smoking.
- Graves is associated with MS. False; it is associated with MG.
- Graves myopathy usually results in an ET and/or a hypotropia. True.
- The medial rectus is more likely than the inferior rectus to be affected. False; the order (most to least likely) is IR > MR > SR > LR.
- Men and women are at equal risk of TED. Nope.

**What is the etiologic name for lid la?**

Their upper lid remains elevated, i.e., it lags. This is a classic TED finding. When a person who doesn’t have TED moves into downgaze, their upper lid margin will follow the globe. In contrast, when a TED pt looks down, their upper lid remains elevated, i.e., it lags. This is a classic TED finding. In the present context, to what does the term lid la refer?

**What is the eponymous name for lid la?**

von Graefe’s sign

**Autoimmune thyroid dz vs TED?**

- Graves aka Thyroid Eye Disease: True/False
- Imaging findings c/w TED
- Typical orbital signs of TED
- Autoimmune thyroid dz
- Thyroiditis
- Thyroid condition, or s/he tests positive for anti-thyroid antibodies

How is this defined?

Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies. One (or more) of a host of anti-thyroid antibodies, or s/he tests positive for an autoimmune thyroid condition, or s/he has a known autoimmune thyroid condition.
Graves orbitopathy is secondary to thyroid disease. Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it. Graves is aggravated by smoking. True; Graves patients should be urged to stop smoking. Graves is associated with MS. False; it is associated with MG. Graves myopathy usually results in an ET and/or a hypotropia. True. The medial rectus is more likely than the inferior rectus to be affected. False; the order (most to least likely) is IR > MR > SR > LR. Men and women are at equal risk of TED. Nope.

How is this defined? Either the pt has a known autoimmune thyroid condition, or she tests positive for one (or more) of a host of anti-thyroid antibodies.

What are the typical orbital signs? -- Eye lid retraction
-- Proptosis
-- Restrictive strabismus (in a manner c/w TED myopathy)
-- Compressive optic neuropathy
-- Edema of the lids and/or conj (ie, chemosis)

What is/are the diagnostic criteria for TED? Pt must have at least two of the following: Autoimmune thyroid dz
Imaging findings c/w TED
Lag
Typical orbital signs of TED

In the present context, to what does the term lid lag refer? When a person who doesn’t have TED moves into downgaze, their upper lid margin will follow the globe. In contrast, when a TED pt looks down, their upper lid remains elevated, ie, ‘lags.’ This is a classic TED finding.

What is the eponymous name for lid lag? Von Graefe’s sign

Graves aka Thyroid Eye Disease: True/False
Graves orbitopathy is secondary to thyroid disease. Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.

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Men and women are at equal risk of TED. Nope.

**Graves aka Thyroid Eye Disease: True/False**

What is/are the diagnostic criteria for TED? Pt must have at least two of the following:

- Autoimmune thyroid dz
- Typical orbital signs of TED
- Imaging findings c/w TED

How is this defined? Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies.

What are the typical orbital signs?

- Eye lid retraction
- Proptosis
- Restrictive strabismus (c/w TED myopathy)
- Compressive optic neuropathy
- Edema of the lids and/or conjunctiva (i.e., chemosis)

What is/are the diagnostic criteria for TED?

Pt must have at least two of the following:

- Autoimmune thyroid dz
- Typical orbital signs of TED
- Imaging findings c/w TED

In the present context, to what does the term "lid lag" refer? When a person who doesn't have TED moves downgaze, their upper lid margin will follow the globe. In contrast, when a TED pt looks down, their upper lid remains elevated, ie, it 'lags.' This is a classic TED finding.

What is the eponymous name for lid lag? Von Graefe's sign.

It may be classic for TED, but is it pathognomonic? No.
Graves aka Thyroid Eye Disease: True/False

What is/are the diagnostic criteria for TED? Pt must have at least two of the following:

- Autoimmune thyroid dz
- Typical orbital signs of TED
- Imaging findings c/w TED

Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it. Graves is aggravated by smoking True; Graves patients should be urged to stop smoking. Graves is associated with MS False; it is associated with MG.

- Graves myopathy usually results in an ET and/or a hypotropia True

- The medial rectus is more likely than the inferior rectus to be affected False; the order (most to least likely) is IR>MR>SR>LR

- Men and women are at equal risk of TED Nope

How is this defined? Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies

What are the typical orbital signs?

- Proptosis
- Restrictive strabismus (in a manner c/w TED myopathy)
- Compressive optic neuropathy
- Edema of the lids and/or conj (ie, chemosis)

What is/are the diagnostic criteria for TED? Pt must have at least two of the following:

- Autoimmune thyroid dz
- Typical orbital signs of TED
- Imaging findings c/w TED

It may be classic for TED, but is it pathognomonic? No

In the present context, to what does the term lid lag refer?

When a person who ‘doesn’t’ have TED moves into downgaze, their upper lid margin will follow the globe. In contrast, when a TED pt looks down, their upper lid remains elevated, ie, it ‘lags.’ This is a classic TED finding.

What is the eponymous name for lid lag?

von Graefe's sign

It may be classic for TED, but is it pathognomonic? No
Graves orbitopathy is secondary to thyroid disease, but it is not caused by it. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction.

Graves is aggravated by smoking. True; Graves patients should be urged to stop smoking.

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Graves myopathy usually results in an ET and/or a hypotropia. True.

The medial rectus is more likely than the inferior rectus to be affected. False; the order (most to least likely) is IR > MR > SR > LR.

Men and women are at equal risk of TED. Nope.

How is this defined? Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies.

What are the diagnostic criteria for TED? Pt must have at least two of the following:

- Autoimmune thyroid dz
- Typical orbital signs of TED
- Imaging findings c/w TED

What is/are the diagnostic criteria for TED? Pt must have at least two of the following:

- Autoimmune thyroid dz
- Typical orbital signs of TED
- Imaging findings c/w TED

What is the eponymous name for lid lag when it is present in a non-TED pt? Pseudo-von Graefe’s sign.

What is the eponymous name for lid lag? von Graefe’s sign.

What is lid lag? When a person who ‘doesn’t’ have TED moves into downgaze, their upper lid margin will follow the globe. In contrast, when a TED pt looks down, their upper lid remains elevated, ie, it ‘lags.’

In the present context, to what does the term lid lag refer? When a person who ‘doesn’t’ have TED moves into downgaze, their upper lid margin will follow the globe. In contrast, when a TED pt looks down, their upper lid remains elevated, ie, it ‘lags.’

This is a classic TED finding.
Graves aka Thyroid Eye Disease: True/False

What is/are the diagnostic criteria for TED? Pt must have at least two of the following:

- Autoimmune thyroid dz
- Typical orbital signs of TED
- Imaging findings c/w TED

How is this defined?
Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies

Sort of, but not really: Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it

Graves is aggravated by smoking True; Graves patients should be urged to stop smoking

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Graves myopathy usually results in an ET and/or a hypotropia True

The medial rectus is more likely than the inferior rectus to be affected False; the order (most to least likely) is IR>MR>SR>LR

Men and women are at equal risk of TED Nope

In the present context, to what does the term "lid lag" refer?
When a person who *doesn't* have TED moves into downgaze, their upper lid margin will follow the globe. In contrast, when a TED pt looks down, their upper lid remains elevated, ie, it 'lags.' This is a classic TED finding.

What is the eponymous name for lid lag?

- *von Graefe's sign*

What is the eponymous name for lid lag when it is present in a non-TED pt?

- Pseudo-von Graefe's sign

It may be classic for TED, but is it pathognomonic?
No

What is the eponymous name for lid lag when it is present in a non-TED pt?
Graves orbitopathy is secondary to thyroid disease

Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.

- Graves is aggravated by smoking  True; Graves patients should be urged to stop smoking
- Graves is associated with MS  False; it is associated with MG
- Graves myopathy usually results in an ET and/or a hypotropia  True
- The medial rectus is more likely than the inferior rectus to be affected  False; the order (most to least likely) is IR>MR>SR>LR
- Men and women are at equal risk of TED  Nope

What is/are the diagnostic criteria for TED? Pt must have at least two of the following:
- Autoimmune thyroid dz
- Typical orbital signs of TED
- Imaging findings c/w TED

How is this defined?
Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies

What are the typical orbital signs?
- Eyelid retraction
- Proptosis
- Restrictive strabismus (in a manner c/w TED myopathy)
- Compressive optic neuropathy
- Edema of the lids and/or conj (ie, chemosis)
Graves aka Thyroid Eye Disease: True/False

- Graves orbitopathy is secondary to thyroid disease
  - Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.
- Graves is aggravated by smoking
  - True; Graves patients should be urged to stop smoking
- Graves is associated with MS
  - False; it is associated with MG
- Graves myopathy usually results in an ET and/or a hypotropia
  - True
- The medial rectus is more likely than the inferior rectus to be affected
  - False; the order (most to least likely) is IR > MR > SR > LR
- Men and women are at equal risk of TED
  - Nope

What is/are the diagnostic criteria for TED? Pt must have at least two of the following:
- Autoimmune thyroid dz
- Typical orbital signs of TED
- Imaging findings c/w TED

How is this defined?
- Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies

What are these findings?
- Enlargement of the EOMs (in a manner c/w TED myopathy)

What are the typical orbital signs?
- Eyelid retraction
- Proptosis
- Restrictive strabismus (in a manner c/w TED myopathy)
- Compressive optic neuropathy
- Edema of the lids and/or conj (ie, chemosis)
Graves orbitopathy is secondary to thyroid disease

Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.

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Graves myopathy usually results in an ET and/or a hypotropia True

The medial rectus is more likely than the inferior rectus to be affected False; the order (most to least likely) is IR>MR>SR>LR

Men and women are at equal risk of TED Nope

What is/are the diagnostic criteria for TED? Pt must have at least two of the following:

- Autoimmune thyroid dz
- Typical orbital signs of TED
- Imaging findings c/w TED

How is this defined? Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies

What are the typical orbital signs?--Eyelid retraction--Proptosis--Restrictive strabismus (in a manner c/w TED myopathy)--Compressive optic neuropathy--Edema of the lids and/or conj (ie, chemosis)

What are these findings? Enlargement of the EOMs (in a manner c/w TED myopathy)

What does this mean, ‘in a manner c/w TED myopathy’? Enlargement of the EOMs is fusiform or ‘tendon sparing’

What are the typical orbital signs of TED?--Eyelid retraction--Proptosis--Restrictive strabismus (in a manner c/w TED myopathy)--Compressive optic neuropathy--Edema of the lids and/or conj (ie, chemosis)
Graves orbitopathy is secondary to thyroid disease

- Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.

- Graves is aggravated by smoking: True; Graves patients should be urged to stop smoking.

- Graves is associated with MS: False; it is associated with MG.

- Graves myopathy usually results in an ET and/or a hypotropia: True.

- The medial rectus is more likely than the inferior rectus to be affected: False; the order (most to least likely) is IR>MH>SR>LR.

- Men and women are at equal risk of TED: Nope.

| What is/are the diagnostic criteria for TED? Pt must have at least two of the following: |
|----------------------------------|----------------------------------|----------------------------------|
| Autoimmune thyroid dz            | Typical orbital signs of TED     | Imaging findings c/w TED         |
| How is this defined?             |                                  |                                  |
| Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies |                                  |                                  |
| What are these findings?         | Enlargement of the EOMs (in a manner c/w TED myopathy) |
| What does this mean, ‘in a manner c/w TED myopathy’? | It means two things: |
|                                  | --                               |
| What are the typical orbital signs of TED? | -- Eyelid retraction  |
|                                    | -- Proptosis                     |
|                                    | -- Restrictive strabismus (in a manner c/w TED myopathy) |
|                                    | -- Compressive optic neuropathy  |
|                                    | -- Edema of the lids and/or conj (ie, chemosis) |
Graves aka Thyroid Eye Disease: True/False

What is/are the diagnostic criteria for TED? Pt must have at least two of the following:

- Autoimmune thyroid dz
- Typical orbital signs of TED
- Imaging findings c/w TED

How is this defined?
Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies.

What are the typical orbital signs of TED?
- Eyelid retraction
- Proptosis
- Restrictive strabismus (in a manner c/w TED myopathy)
- Compressive optic neuropathy
- Edema of the lids and/or conj (ie, chemosis)

What does this mean, ‘in a manner c/w TED myopathy’?
It means two things:
- Enlargement of the EOMs is shape, aka ‘two words’
- Enlargement of the EOMs is fusiform, aka ‘tendon sparing’

What are these findings?
- Enlargement of the EOMs (in a manner c/w TED myopathy)
- Involvement of the EOMs occurs in this order: IR>MR>SR>LR

Graves is associated with MG True

Graves myopathy usually results in an ET and/or a hypotropia True

The medial rectus is more likely than the inferior rectus to be affected False; the order (most to least likely) is IR>MR>SR>LR

Men and women are at equal risk of TED Nope
Graves aka Thyroid Eye Disease: True/False

What is/are the diagnostic criteria for TED? Pt must have at least two of the following:

- Autoimmune thyroid dz
- Typical orbital signs of TED
- Imaging findings c/w TED

How is this defined?
Either the pt has a known autoimmune thyroid condition, or s/he tests positive for one (or more) of a host of anti-thyroid antibodies

What are these findings?
- Enlargement of the EOMs (in a manner c/w TED myopathy)

What does this mean, ‘in a manner c/w TED myopathy’?
It means two things:
- Enlargement of the EOMs is fusiform, aka ‘tendon sparing’

What are the typical orbital signs?
- Eyelid retraction
- Proptosis
- Restrictive strabismus (in a manner c/w TED myopathy)
- Compressive optic neuropathy
- Edema of the lids and/or conj (ie, chemosis)

Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.

- Graves is aggravated by smoking; True; Graves patients should be urged to stop smoking
- Graves is associated with MS; False; it is associated with MG
- Graves myopathy usually results in an ET and/or a hypotropia; True
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Graves *aka* Thyroid Eye Disease: True/False

TED: Tendon-sparing EOM enlargement
Graves aka Thyroid Eye Disease: True/False

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It means two things:
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- Involvement of the EOMs occurs…in this order:

  IR > MR > SR > LR

**What are the typical orbital signs?**

- Eyelid retraction
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**Graves is aggravated by smoking** True; Graves patients should be urged to stop smoking.

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*What is the natural history of TED?*
It is a self-limited disease that tends to ‘burn itself out’ over time, but may leave disfiguring sequelae.

*On average, how long does it take to burn itself out?*

- **Mild disease** can be managed symptomatically (ie, maneuvers to lessen surface dryness/irritation)
- **Moderate disease** requires more aggressive surface protection (eg, moisture goggles), and PO steroids
- **Severe disease** involves sight-threatening complications such as corneal decompensation, and/or optic neuropathy. This necessitates more aggressive steroid therapy, and consideration should be given to the use of steroid-sparing IMT and/or orbital radiation therapy. as a last resort.

*On average, how long does it take to burn itself out?*

- **Nonsmokers**: ~1 year
- **Smokers**: 2-3 years
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It is a self-limited disease that tends to ‘burn itself out’ over time, but may leave disfiguring sequelae.

On average, how long does it take to burn itself out?
That depends on whether the pt is a smoker.

How long for nonsmokers?
~1 year

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Graves aka Thyroid Eye Disease: True/False
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A biologic is now FDA-approved for TED. What is the brand name?
Tepezza

What is its trade name?
Teprotumumab

What does it target?
It binds to and blocks the receptor for insulin-like growth factor 1 (IGF-1)
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What does it target?

It binds to and blocks the receptor for insulin-like growth factor 1 (IGF-1).
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What does the stem –mab indicate? It indicates the med is a monoclonal antibody

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--Severe disease involves sight-threatening complications such as corneal decompensation, and/or optic neuropathy. This necessitates more aggressive steroid therapy, and consideration should be given to the use of steroid-sparing IMT and/or orbital radiation therapy. A last resort.

A biologic is now FDA-approved for TED. What is the brand name? Tepezza.

What is its trade name? Teprotum-u-mab.

What does the stem –mab indicate? It indicates the med is a monoclonal antibody.

What does the substem –u- indicate? That the antibody is human, ie, it didn’t derive from work done on another species.

What does the infix –tum- indicate? That the molecule is used against tumors (teprotumumab was developed as an anti-cancer med).
Graves orbitopathy is secondary to thyroid disease. Sort of, but not really. Graves is an autoimmune disease that is strongly associated with thyroid dysfunction, but it is not caused by it.

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What does it target?
It binds to and blocks the receptor for insulin-like growth factor 1 (IGF-1).
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What about orbital surgery? Why not just bust up in there and address these issues directly?

Surgery while the dz is active should be avoided if possible, because dz progression post-surgery may render the results medically or cosmetically unacceptable.
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If surgery during active TED is relatively contraindicated, when should it be considered? Once the pt is euthyroid, and his/her orbital condition has been stable for at least 6 months.

Suppose a pt meeting those criteria needs orbital decompression, has strabismus, and also has malpositioned eyelids. What should the overall surgical strategy be? Because orbital-decompression surgery will affect both EOM and lid position, the decompression surgery must precede strabismus and/or lid surgery. Likewise, because strabismus surgery will affect lid position, the strabismus surgery must precede the lid surgery. Putting it all together, the surgical order is as follows: 1. Decompression 2. Strabismus 3. Eyelids.

Graves aka Thyroid Eye Disease: True/False

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### Rendering the pt euthyroid is an important goal for TED pts (to be pursued by Endo/IM, of course).
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What about treating the concurrent thyroid disease?
Rendering the pt euthyroid is an important goal for TED pts (to be pursued by Endo/IM, of course). However, it is important to note that some treatments in this regard can aggravate the TED by increasing immune activity against the TSH-receptor antigens that are responsible for TED.

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