What does the term "Entropion" mean?
What does the term **Entropion** mean?
It means the eyelid margin is turning **inward**

**Entropion** vs **Ectropion**

**Ectropion**
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The Plastics book identifies six general causes of entropion and/or ectropion. What are they? (Note that while most apply to both entropion and ectropion, a few apply only to one or the other.)
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Let’s take a closer look at involutional entropion vs involutional ectropion...
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:
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- Horizontal lid laxity
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*How can you assess for horizontal laxity of the lower lid?*
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- **Horizontal lid laxity** - BOTH

*How can you assess for horizontal laxity of the lower lid?*

Very simply: By pulling it away from the globe, ie, by **distracting** it.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

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1) the **snapback** test

2) the **distraction** test
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- **Horizontal lid laxity** - *BOTH*

*How can you assess for horizontal laxity of the lower lid?*

Very simply: By pulling it away from the globe, i.e., by *distracting* it. This allows assessment of lid tautness via two tests:

1) the **snapback** test, which is based on the fact that...A taut lower lid will re-appose the globe quickly when released, like a rubber band snapping back into place. (Try it on yourself.) **If clinically significant laxity is present, the lid will re-appose the surface in a much less brisk manner.**

2) the **distraction** test: If the lid can be distracted more than [distance] from the ocular surface, it is lax to a clinically significant degree.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- **Horizontal lid laxity**: BOTH

**How can you assess for horizontal laxity of the lower lid?**

Very simply: By pulling it away from the globe, ie, by *distracting* it. This allows assessment of lid tautness via two tests:

1) the **snapback** test, which is based on the fact that...A taut lower lid will re-appose the globe quickly when released, like a rubber band snapping back into place. (Try it on yourself.) **If clinically significant laxity is present, the lid will re-appose the surface in a much less brisk manner.**

2) the **distraction** test: If the lid can be distracted more than 6 mm from the ocular surface, it is lax to a clinically significant degree.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

*Time out—before we answer this question, let’s take a minute to review the anatomy of the lid retractors*
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

Upper-lid Retraction

Let's start with the upper lid, as its anatomy is likely more familiar.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

Let’s start with the upper lid, as its anatomy is likely more familiar.

*What is the name of the muscle that is the prime retractor (elevator) of the upper lid?*
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional *entropion*, lower-lid involutional *ectropion*, or *both*:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris* m.

Let's start with the upper lid, as its anatomy is likely more familiar.

*What is the name of the muscle that is the prime retractor (elevator) of the upper lid?*

The *levator palpebrae superioris* (levator for short)
Q

For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional *entropion*, lower-lid involutional *ectropion*, or *both*:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the *eyelid retractors*

**Involutional Entropion vs Involutional Ectropion**

Let's start with the upper lid, as its anatomy is likely more familiar.

*What is the name of the muscle that is the prime retractor (elevator) of the upper lid?*

The *levator palpebrae superioris* (levator for short)

*What structural component of the lid is the primary recipient of the force exerted by the levator, the result of which is elevation of the lid margin?*
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

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- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

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*What structural component of the lid is the primary recipient of the force exerted by the levator, the result of which is elevation of the lid margin?*

The *superior tarsal plate*
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional **entropion**, lower-lid involutional **ectropion**, or **both**:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

Let's start with the upper lid, as its anatomy is likely more familiar.

**What is the name of the muscle that is the prime retractor (elevator) of the upper lid?**

The *levator palpebrae superioris* (levator for short)

**What structural component of the lid is the primary recipient of the force exerted by the levator, the result of which is elevation of the lid margin?**

The *superior tarsal plate*
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  • Horizontal lid laxity: BOTH
  • Disinsertion of the eyelid retractors

Let’s start with the upper lid, as its anatomy is likely more familiar.

What is the name of the muscle that is the prime retractor (elevator) of the upper lid?
The levator palpebrae superioris (levator for short)

What structural component of the lid is the primary recipient of the force exerted by the levator, the result of which is elevation of the lid margin?
The superior tarsal plate
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional **entropion**, lower-lid involutional **ectropion**, or **both**:

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Let's start with the upper lid, as its anatomy is likely more familiar. What is the name of the muscle that is the prime retractor (elevator) of the upper lid? The **levator palpebrae superioris** (levator for short).

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Let's start with the upper lid, as its anatomy is likely more familiar. What is the name of the muscle that is the prime retractor (elevator) of the upper lid? The **levator palpebrae superioris** (levator for short).

What structural component of the lid is the primary recipient of the force exerted by the levator, the result of which is elevation of the lid margin? The **superior tarsal plate**.

There is a well-known ring-shaped structure at the apex which is related to muscle origins. What is the eponymous name of this structure? The **annulus of Zinn**.

Is the levator's origin a component of the annulus of Zinn? No, the levator originates from just above the annulus.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

Let's start with the upper lid, as its anatomy is likely more familiar.

What is the name of the muscle that is the prime retractor (elevator) of the upper lid?

**levator palpebrae superioris** (levator for short)

What structural component of the lid is the primary recipient of the force exerted by the levator, the result of which is elevation of the lid margin?

**superior tarsal plate**

Let's start with the upper lid, as its anatomy is likely more familiar.

From where does it originate?

**the apex of the orbit**

We know the levator will insert (or near) the superior tarsal plate, but from where does it originate?

There is a well-known ring-shaped structure at the apex which is related to muscle origins. What is the eponymous name of this structure?

The annulus of Zinn

What is the superior tarsal plate part of?

The eyelid
Involutional Entropion vs Involutional Ectropion

The annulus of Zinn
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
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Let’s start with the upper lid, as its anatomy is likely more familiar.

What is the name of the muscle that is the prime retractor (elevator) of the upper lid?

The *levator palpebrae superioris* (levator for short)

What structural component of the lid is the primary recipient of the force exerted by the levator, the result of which is elevation of the lid margin?

The *superior tarsal plate*

Let’s know the levator will insert (or near) the superior tarsal plate…

…but from where does it originate?

From the apex of the orbit.

There is a well-known ring-shaped structure at the apex which is related to muscle origins. What is the eponymous name of this structure?

The annulus of Zinn

Is the levator’s origin a component of the annulus of Zinn?
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Involutional Entropion vs Involutional Ectropion**

Let’s start with the upper lid, as its anatomy is likely more familiar.

**What is the name of the muscle that is the prime retractor (elevator) of the upper lid?**

*Levator palpebrae superioris* (levator for short)

**What structural component of the lid is the primary recipient of the force exerted by the levator, the result of which is elevation of the lid margin?**

*Superior tarsal plate*

*We know the levator will insert (or near) the superior tarsal plate…*

*…but from where does it originate?*

*From the apex of the orbit*

*There is a well-known ring-shaped structure at the apex which is related to muscle origins. What is the eponymous name of this structure?*

*The annulus of Zinn*

*Is the levator’s origin a component of the annulus of Zinn?*

*No, the levator originates from just above the annulus, result of which is elevation of the lid margin?*

*The superior tarsal plate*
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutinal entropion, lower-lid involutinal ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

### Upper-lid Retraction

**Levator palpebrae superioris m.**

...but from where does it originate?

From the apex of the orbit

We know the levator will insert (or near) the superior tarsal plate

There is a well-known ring-shaped structure at the apex which is related to muscle origins. What is the eponymous name of this structure?

The annulus of Zinn

Is the levator’s origin a component of the annulus of Zinn?

No, the levator originates from just above the annulus, result of which is elevation of the lid margin.

The superior tarsal plate
Involutional Entropion vs Involutional Ectropion

Origin of the levator

Annulus of Zinn

The annulus of Zinn
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

**Levator palpebrae superioris m.**

...but from where does it originate?

From the apex of the orbit

We know the levator will insert (or near) the superior tarsal plate...

OK, if not the levator, which muscles do give rise to the annulus of Zinn?

There is a well-known ring-shaped structure at the apex which is related to muscle origins. What is the eponymous name of this structure?

The annulus of Zinn

Is the levator’s origin a component of the annulus of Zinn?

No, the levator originates from just above the annulus

result of which is elevation of the lid margin?

The superior tarsal plate
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris m.*

...but from where does it originate?

From the apex of the orbit

We know the levator will insert (or near) the superior tarsal plate.

Is the levator’s origin a component of the annulus of Zinn?

No, the levator originates from just above the annulus, a result of which is elevation of the lid margin.

**The annulus of Zinn**

The origins of the four recti muscles comprise the annulus.

There is a ring-shaped structure at the apex which is related to muscle origins. What is the eponymous name of this structure?

The annulus of Zinn

OK, if not the levator, which muscles *do* give rise to the annulus of Zinn?

The origins of the four recti muscles comprise the annulus.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutorial entropion, lower-lid involutorial ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**

### Upper-lid Retraction

The annulus encircles all or part of two foramina at the orbital apex. Which two?

- The origins of the four recti muscles comprise the annulus
- A portion of the superior orbital fissure, and the optic foramen (encircled in its entirety)

We know the levator will insert (or near) the superior tarsal plate...

... but from where does it originate?

From the apex of the orbit

The annulus encircles all or part of two foramina at the orbital apex. Which two?

- The origins of the four recti muscles comprise the annulus
- A portion of the superior orbital fissure, and the optic foramen (encircled in its entirety)
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors

Upper-lid Retraction

The annulus encircles all or part of two foramina at the orbital apex. Which two?
A portion of the superior orbital fissure, and the optic foramen (encircled in its entirety)

…but from where does it originate?
From the apex of the orbit

We know the levator will insert (or near) the superior tarsal plate

The annulus of Zinn

Is the levator’s origin a component of the annulus of Zinn?
No, the levator originates from just above the annulus
result of which is elevation of the lid margin?
The superior tarsal plate
The superior orbital fissure and the optic canal

**Inferior orbital fissure, if you're wondering**

**Superior orbital fissure**

**Optic canal**

**Annulus of Zinn**

**Involutional Entropion vs Involutional Ectropion**
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **Both**
- Disinsertion of the eyelid retractors:
  - Superior tarsal plate: **Levator palpebrae superioris** (levator for short)
  - Involutional Entropion
  - Involutional Ectropion

Let's start with the upper lid, as its anatomy is likely more familiar. What is the name of the muscle that is the prime retractor (elevator) of the upper lid? The **levator palpebrae superioris** is the primary elevator of the upper lid.

What structural component of the lid is the primary recipient of the force exerted by the levator, the result of which is elevation of the lid margin? The **superior tarsal plate** is the primary recipient of the force exerted by the levator muscle.

From where does the levator originate? The levator inserts at or near the superior tarsal plate. There is a well-known ring-shaped structure at the apex of the orbit, what is the eponymous name of this structure? The annulus of Zinn.

Is the levator’s origin a component of the annulus of Zinn? No, the levator originates from just above the annulus of Zinn.

The origins of the four recti muscles comprise the annulus. The annulus encircles all or part of two foramina at the orbital apex. Which two? A portion of the superior orbital fissure, and the optic foramen (encircled in its entirety).

Five key ophthalmic structures pass through these foramina—and the annulus—into the orbit. What are they?
- Enter orbit via the optic canal
- Enter orbit via the superior orbital fissure

We know the levator will insert (or near) the superior tarsal plate, but from where does it originate? From the apex of the orbit. What is the eponymous name of this structure? The annulus of Zinn.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors

Upper-lid retractors

**Involutional Entropion**

- The levator palpebrae superioris (levator for short)
- The superior tarsal plate

**Involutional Ectropion**

**Upper-lid Retraction**

- From the apex of the orbit...but from where does it originate?
- There is a ring-shaped structure at the orbital apex. What is the eponymous name of this structure?
- The annulus of Zinn
- Is the levator’s origin a component of the annulus of Zinn?
- No, the levator originates from just above the annulus, resulting in elevation of the lid margin?
- The superior tarsal plate

**Five key ophthalmic structures pass through these foramina—and the annulus—into the orbit. What are they?**

- The optic nerve
- The ophthalmic artery
- CN3
- CN6
- The nasociliary nerve (a branch of the trigeminal nerve, specifically, a branch of V1, aka the ophthalmic division)

Enter orbit via the optic canal
Enter orbit via the superior orbital fissure

A portion of the superior orbital fissure, and the optic foramen (encircled in its entirety) give rise to the annulus of Zinn?

The origins of the four recti muscles comprise the annulus...

We know the levator will insert (or near) the superior tarsal plate...
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: 

Let's start with the upper lid, as its anatomy is likely more familiar.

What is the name of the muscle that is the prime retractor (elevator) of the upper lid?

The **levator palpebrae superioris** (levator for short)

What structural component of the lid is the primary recipient of the force exerted by the levator, the result of which is elevation of the lid margin?

The **superior tarsal plate**

...but from where does it originate?

From the apex of the orbit

There is a well-known ring-shaped structure at the orbital apex. What is the eponymous name of this structure?

The annulus of Zinn

Is the levator's origin a component of the annulus of Zinn?

No, the levator originates from just above the annulus, the result of which is elevation of the lid margin?

The superior tarsal plate

Five key ophthalmic structures pass through these foramina—and the annulus—into the orbit. What are they?

- The optic nerve
- The ophthalmic artery
- CN3
- CN6
- The nasociliary nerve

Enter orbit via the optic canal

Enter orbit via the superior orbital fissure

The annulus encircles all or part of the apex at the orbital apex. Which two?

A portion of the superior orbital fissure, and the optic foramen (encircled in its entirety)

Is the annulus of Zinn related to muscle origins?

No, the annulus of Zinn does not give rise to the annulus of Zinn.

The origins of the four recti muscles comprise the annulus.

We know the levator will insert (or near) the superior tarsal plate...
For each of the following, state whether it plays a role in the pathogenesis of involutional entropion, lower-lid ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

Let's start with the upper lid, as its anatomy is likely more familiar.

What is the name of the muscle that is the prime retractor (elevator) of the upper lid?
- **levator palpebrae superioris** (levator for short)

What structural component of the lid is the primary recipient of the force exerted by the levator, the result of which is elevation of the lid margin?
- **superior tarsal plate**

...but from where does it originate?
- From the apex of the orbit

There is a well-known ring-shaped structure at the orbital apex which is related to muscle origins. What is the eponymous name of this structure?
- **annulus of Zinn**

Is the levator’s origin a component of the annulus of Zinn?
- No, the levator originates from just above the annulus

The origins of the four recti muscles comprise the annulus.

The annulus encircles all or part of two foramina at the orbital apex. Which two?
- A portion of the superior orbital fissure, and the optic foramen (encircled in its entirety)

Five key ophthalmic structures pass through these foramina—and the annulus—into the orbit. What are they?
- The optic nerve
- The ophthalmic artery
- CN3
- CN6
- The nasociliary nerve (a branch of the cranial n.)

We know the levator will insert (or near) the superior tarsal plate, a result of which is elevation of the lid margin.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid ectropion, or both:

- **Horizontal lid laxity**: BOTH
- **Disinsertion of the eyelid retractors**: BOTH

Upper-lid Retraction

...but from where does it originate?

From the apex of the orbit. We know the levator will insert (or near) the superior tarsal plate. The superior tarsal plate

The annulus encircles all or part of the orbit at the orbital apex. Which two?

Two foramina: A portion of the superior orbital fissure, and the optic foramen (encircled in its entirety)

Five key ophthalmic structures pass through these foramina—and the annulus—into the orbit. What are they?

- The optic nerve
- The ophthalmic artery
- CN3
- CN6
- The nasociliary nerve (a branch of the trigeminal nerve)

Is the levator’s origin a component of the annulus of Zinn?

No, the levator originates from just above the annulus, the result of which is elevation of the lid margin?

The superior tarsal plate

The origins of the four recti muscles comprise the annulus.

Is the levator’s origin in the annulus?

No, the levator originates from just above the annulus, the result of which is elevation of the lid margin.

The annulus of Zinn

The annulus encircles all or part of the orbit at the orbital apex. Which two?

Two foramina: A portion of the superior orbital fissure, and the optic foramen (encircled in its entirety)

There is a ring-shaped structure at the orbital apex which is related to muscle origins. What is the eponymous name of this structure?

The annulus of Zinn

The annulus encircles all or part of the orbit at the orbital apex. Which two?

Two foramina: A portion of the superior orbital fissure, and the optic foramen (encircled in its entirety)

Is the levator’s origin a component of the annulus of Zinn?

No, the levator originates from just above the annulus, the result of which is elevation of the lid margin.

The superior tarsal plate

Five key ophthalmic structures pass through these foramina—and the annulus—into the orbit. What are they?

- The optic nerve
- The ophthalmic artery
- CN3
- CN6
- The nasociliary nerve (a branch of the trigeminal nerve)

Is the levator’s origin in the annulus?

No, the levator originates from just above the annulus, the result of which is elevation of the lid margin.

The superior tarsal plate

For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid ectropion, or both:

- **Horizontal lid laxity**: BOTH
- **Disinsertion of the eyelid retractors**: BOTH

Upper-lid Retraction

...but from where does it originate?

From the apex of the orbit. We know the levator will insert (or near) the superior tarsal plate. The superior tarsal plate

The annulus encircles all or part of the orbit at the orbital apex. Which two?

Two foramina: A portion of the superior orbital fissure, and the optic foramen (encircled in its entirety)

Five key ophthalmic structures pass through these foramina—and the annulus—into the orbit. What are they?

- The optic nerve
- The ophthalmic artery
- CN3
- CN6
- The nasociliary nerve (a branch of the trigeminal nerve)

Is the levator’s origin a component of the annulus of Zinn?

No, the levator originates from just above the annulus, the result of which is elevation of the lid margin.

The superior tarsal plate

The annulus encircles all or part of the orbit at the orbital apex. Which two?

Two foramina: A portion of the superior orbital fissure, and the optic foramen (encircled in its entirety)

There is a ring-shaped structure at the orbital apex which is related to muscle origins. What is the eponymous name of this structure?

The annulus of Zinn

The annulus encircles all or part of the orbit at the orbital apex. Which two?

Two foramina: A portion of the superior orbital fissure, and the optic foramen (encircled in its entirety)

Is the levator’s origin in the annulus?

No, the levator originates from just above the annulus, the result of which is elevation of the lid margin.

The superior tarsal plate

Five key ophthalmic structures pass through these foramina—and the annulus—into the orbit. What are they?

- The optic nerve
- The ophthalmic artery
- CN3
- CN6
- The nasociliary nerve (a branch of the trigeminal nerve)

Is the levator’s origin in the annulus?

No, the levator originates from just above the annulus, the result of which is elevation of the lid margin.

The superior tarsal plate

The annulus encircles all or part of the orbit at the orbital apex. Which two?

Two foramina: A portion of the superior orbital fissure, and the optic foramen (encircled in its entirety)
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

Involutional Entropion vs Involutional Ectropion

Let's start with the upper lid, as its anatomy is likely more familiar.

What is the name of the muscle that is the prime retractor (elevator) of the upper lid? The **levator palpebrae superioris** (levator for short).

What structural component of the lid is the primary recipient of the force exerted by the levator, the result of which is elevation of the lid margin? The **superior tarsal plate**.

...but from where does it originate?

From the **apex of the orbit**.

There is a well-known ring-shaped structure at the orbital apex which is related to muscle origins. What is the eponymous name of this structure? The **annulus of Zinn**.

Is the levator’s origin a component of the annulus of Zinn? No, the levator originates from just above the annulus, which is likely not part of this structure.

The origins of the four recti muscles comprise the annulus. Which two foramina at the orbital apex give rise to the annulus of Zinn?

- A portion of the superior orbital fissure
- The optic foramen (encircled in its entirety)

Five key ophthalmic structures pass through these foramina—and the annulus—into the orbit. What are they?

- The optic nerve
- The ophthalmic artery
- CN3
- CN6
- The nasociliary nerve (a branch of the trigeminal nerve)

The annulus encircles all or part of two foramina at the orbital apex. Which two?

- A portion of the superior orbital fissure
- The optic foramen (encircled in its entirety)

Five key ophthalmic structures pass through these foramina—and the annulus—into the orbit. What are they?

- The optic nerve
- The ophthalmic artery
- CN3
- CN6
- The nasociliary nerve (a branch of the trigeminal nerve)

These structures are involved in the function and stability of the eye, including vision and tear production.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors: 

Let's start with the upper lid, as its anatomy is likely more familiar.

What is the name of the muscle that is the prime retractor (elevator) of the upper lid?

The levator palpebrae superioris (levator for short)

What structural component of the lid is the primary recipient of the force exerted by the levator, the result of which is elevation of the lid margin?

The superior tarsal plate

Upper-lid Retraction...

…but from where does it originate?

From the apex of the orbit

There is a well-known ring-shaped structure at the orbital apex. What is the eponymous name of this structure?

The annulus of Zinn

Is the levator’s origin a component of the annulus of Zinn?

No, the levator originates from just above the annulus

OK, if not the levator, which muscles give rise to the annulus of Zinn?

The origins of the four recti muscles comprise the annulus

The annulus encircles all or part of two foramina at the orbital apex. Which two?

A portion of the superior orbital fissure, and the optic foramen (encircled in its entirety)

Five key ophthalmic structures pass through these foramina—and the annulus—into the orbit. What are they?

- The optic nerve
- The ophthalmic artery
- CN3
- CN6
- The nasociliary nerve (a branch of the trigeminal nerve)

(specifically, a branch of V1, aka the ophthalmic division)

We know the levator will insert (or near) the superior tarsal plate...

...but from where does it originate?

From the apex of the orbit

The superior tarsal plate
Key structures passing through the annulus of Zinn
For more on the anatomy of the orbital apex, see slide-set N19
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional *entropion*, lower-lid involutional *ectropion*, or *both*:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris* m.

*The levator itself doesn’t attach to the tarsal plate, rather, its ‘tendon’ does. What is the name of this tendinous structure?*
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional *entropion*, lower-lid involutional *ectropion*, or *both*:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris* m.

*The levator itself doesn’t attach to the tarsal plate, rather, its ‘tendon’ does. What is the name of this tendinous structure?*

*The levator aponeurosis*
Q

For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris* m.

The levator itself doesn’t attach to the tarsal plate, rather, its ‘tendon’ does. What is the name of this tendinous structure?

The **levator aponeurosis**

While it is the primary upper-lid retractor, the levator is not the only one. What other muscle also retracts the upper lid?

Superior tarsal plate
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris* m.

The levator itself doesn’t attach to the tarsal plate, rather, its ‘tendon’ does. What is the name of this tendinous structure?

The *levator aponeurosis*

While it is the primary upper-lid retractor, the levator is not the only one. What other muscle also retracts the upper lid?

*Müller’s muscle*
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional \textit{entropion}, lower-lid involutional \textit{ectropion}, or \textit{both}:

- Horizontal lid laxity: \textbf{BOTH}
- Disinsertion of the \textit{eyelid retractors}

\textbf{Upper-lid Retraction}

\textit{Levator palpebrae superioris} m.

Note: This diagram is misleading in that it suggests the levator connects to the aponeurosis, which in turn connects to Müller’s muscle, which then connects to the tarsal plate.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors

Upper-lid Retraction

*Levator palpebrae superioris* m.

Note: This diagram is misleading in that it suggests the levator connects to the aponeurosis, which in turn connects to Müller’s muscle, which then connects to the tarsal plate. To be clear: At the point where the levator transitions to become aponeurosis, Müller’s arises from its undersurface, and both continue on to the tarsus *in parallel* to one another.
Müller’s muscle, and the aponeurosis
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

Where does Müller’s muscle originate?

Levator palpebrae superioris m.

- Levator aponeurosis
- Müller m.

Müller’s muscle

Where also retracts the upper lid?
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**

**Involutional Entropion vs Involutional Ectropion**

**Upper-lid Retraction**

Where does Müller’s muscle originate?
Deep to the distal tendon of the levator, as mentioned.

Where does Müller’s muscle insert?
At the superior border of the tarsal plate.

Are the fibers in Müller’s muscle striated, or smooth?
Smooth

What does this indicate about the innervation of Müller’s muscle?
Indicates its innervation is via the autonomic nervous system (specifically in this case, by the sympathetic branch).
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional *entropion*, lower-lid involutional *ectropion*, or *both*:

- Horizontal lid laxity
- Disinsertion of the eyelid retractors

**Involutional Entropion vs Involutional Ectropion**

Upper-lid Retraction

*Levator palpebrae superioris m.*

- Where does Müller’s muscle originate? Where does it insert?
  - Deep to the distal tendon of the levator, as mentioned.

**Müller’s muscle**

- Also retracts the upper lid?
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors: BOTH

**Upper-lid Retraction**

*Levator palpebrae superioris m.*

- Where does Müller’s muscle originate? Where does it insert?
- Deep to the distal tendon of the levator, as mentioned. It inserts at the superior border of the tarsal plate.

- Also retracts the upper lid? Müller’s muscle
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris* m.

- Levator aponeurosis
- **Müller** m.
- Superior tarsal plate

**Where does Müller’s muscle originate? Where does it insert?**

Deep to the distal tendon of the levator, as mentioned. It inserts at the superior border of the tarsal plate.

**Are the fibers in Müller’s muscle striated, or smooth?**

Smooth
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: "eyelid retractors"

### Upper-lid Retraction

**Levator palpebrae superioris** m.

- Where does Müller’s muscle originate? Where does it insert? Deep to the distal tendon of the levator, as mentioned. It inserts at the superior border of the tarsal plate.

- Are the fibers in Müller’s muscle striated, or smooth? Smooth
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **eyelid retractors**

**Upper-lid Retraction**

*Levator palpebrae superioris m.*

Where does Müller’s muscle originate? Where does it insert? Deep to the distal tendon of the levator, as mentioned. It inserts at the superior border of the tarsal plate.

Are the fibers in Müller’s muscle striated, or smooth? Smooth

Smooth muscle fibers…What does this indicate about the innervation of Müller’s muscle?

Also retracts the upper lid? Müller’s muscle
Q/A

- For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:
  - Horizontal lid laxity: **BOTH**
  - Disinsertion of the eyelid retractors: **BOTH**

**Involutional Entropion vs Involutional Ectropion**

**Upper-lid Retraction**

Levator palpebrae superioris m.

- Where does Müller’s muscle originate? Where does it insert?
  - Deep to the distal tendon of the levator, as mentioned. It inserts at the superior border of the tarsal plate.

- Are the fibers in Müller’s muscle striated, or smooth?
  - Smooth

- Smooth muscle fibers...What does this indicate about the innervation of Müller’s muscle?
  - It indicates its innervation is via the autonomic nervous system (specifically in this case, by the sympathetic branch)

**Müller’s muscle**
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:
- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**

**Upper-lid Retraction**

*Levator palpebrae superioris m.*

Where does Müller’s muscle originate? Where does it insert?
- Deep to the distal tendon of the levator, as mentioned. It inserts at the superior border of the tarsal plate.

Are the fibers in Müller’s muscle striated, or smooth?
- Smooth

Smooth muscle fibers…What does this indicate about the innervation of Müller’s muscle?
- It indicates its innervation is via the autonomic nervous system.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **eyelid retractors**

### Upper-lid Retraction

Where does Müller’s muscle originate? Where does it insert?
- Deep to the distal tendon of the levator, as mentioned. It inserts at the superior border of the tarsal plate.

Are the fibers in Müller’s muscle striated, or smooth?
- Smooth

Smooth muscle fibers... What does this indicate about the innervation of Müller’s muscle?
- It indicates its innervation is via the autonomic nervous system (specifically in this case, by the **sympathetic** branch).
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris m.*

- Where does Müller’s muscle originate? Where does it insert?
  - Deep to the distal tendon of the levator, as mentioned. It inserts at the superior border of the tarsal plate.

- Are the fibers in Müller’s muscle striated, or smooth?
  - Smooth

- Smooth muscle fibers…What does this indicate about the innervation of Müller’s muscle?
  - It indicates its innervation is via the autonomic nervous system (specifically in this case, by the sympathetic branch)
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris m.*

- Levator aponeurosis
- *Müller* m.
- Superior tarsal plate

*Hold the phone. Given that it originates at the orbital apex, how is it the levator elevates the upper lid?*

*(Rhetorical question—advance to next slide)*
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional *entropion*, lower-lid involutional *ectropion*, or *both*:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris* m.

- **Hold the phone. Given that it originates at the orbital apex, how is it the levator elevates the upper lid?** That is, why doesn’t contraction of the levator pull the upper lid margin back, *i.e.*, into the orbit?

(OK, now answer)
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional *entropion*, lower-lid involutional *ectropion*, or *both*:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris* m.

- **Hold the phone.** Given that it originates at the orbital apex, *how is it the levator elevates the upper lid?* That is, *why doesn’t contraction of the levator pull the upper lid margin back*, ie, *into the orbit?*

It’s because, on its way to the tarsal plate, the levator complex interacts with an orbital structure which acts as a fulcrum to *change the direction of the force-vector of the levator from anterior-posterior to superior-inferior.*
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**

### Upper-lid Retraction

*Levator palpebrae superioris* m.

Hold the phone. Given that it originates at the orbital apex, how is it the levator elevates the upper lid? That is, why doesn’t contraction of the levator pull the upper lid margin back, ie, into the orbit?

It’s because, on its way to the tarsal plate, the levator complex interacts with an orbital structure which acts as a fulcrum to change the direction of the force-vector of the levator from anterior-posterior to superior-inferior.

What is the eponymous name of this structure?
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris m.*

*Hold the phone. Given that it originates at the orbital apex, how is it the levator elevates the upper lid? That is, why doesn’t contraction of the levator pull the upper lid margin back, ie, into the orbit?*

It’s because, on its way to the tarsal plate, the levator complex interacts with an orbital structure which acts as a fulcrum to change the direction of the force-vector of the levator from anterior-posterior to superior-inferior.

*What is the eponymous name of this structure?* Whitnall’s ligament
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

Upper-lid Retraction

*Levator palpebrae superioris* m.

Whitnall’s ligament

Levator aponeurosis

*Müller* m.

Superior tarsal plate

Hold the phone. Given that it originates at the orbital apex, how is it the levator elevates the upper lid? That is, why doesn’t contraction of the levator pull the upper lid margin back, ie, into the orbit?

At what point in its forward ‘journey’ does the levator complex encounter Whitnall’s ligament?

What is the eponymous name of this structure?

*Whitnall’s ligament*
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors

### Upper-lid Retraction

*Levator palpebrae superioris* m.

Hold the phone. Given that it originates at the orbital apex, how is it the levator elevates the upper lid? That is, why doesn’t contraction of the levator pull the upper lid margin back, i.e., into the orbit?

At what point in its forward ‘journey’ does the levator complex encounter Whitnall’s ligament?

At the point where the complex splits into its anterior aponeurotic component and its posterior Müller-muscle component.

What is the eponymous name of this structure?

*Whitnall’s ligament*
Whitnall’s ligament. Note the relationship to the levator muscle, as well as to the levator aponeurosis.
Q

- For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:
  - Horizontal lid laxity: **BOTH**
  - Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris* m.

Hold the phone. Given that it originates at the orbital apex, how is it the levator elevates the upper lid? That is, why doesn't contraction of the levator pull the upper lid margin back, i.e., into the orbit? It's because, on its way to the tarsal plate, the levator complex interacts with an orbital structure which acts as a pulley or fulcrum to change the direction of the force-vector of the levator from anterior-posterior to superior-inferior.

What is the eponymous name of this structure?

*Whitnall’s ligament*

Located on the lateral wall of the orbit is a protuberance known as the lateral orbital tubercle of Whitnall.

*(No question yet—keep going)*

What is the eponymous name of this structure?

*Whitnall’s ligament*
Involutional **Entropion** vs Involutional **Ectropion**

Whitnall’s tubercle
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris* m.

Hold the phone. Given that it originates at the orbital apex, how is it the levator elevates the upper lid? That is, why doesn't contraction of the levator pull the upper lid margin back, ie, into the orbit?

It's because, on its way to the tarsal plate, the levator complex interacts with an orbital structure which acts as a pulley or fulcrum to change the direction of the force-vector of the levator from anterior-posterior to superior-inferior. What is the eponymous name of this structure?

*Whitnall’s ligament*

Located on the lateral wall of the orbit is a protuberance known as the lateral orbital tubercle of Whitnall. Is it safe to assume that Whitnall’s ligament attaches to Whitnall’s tubercle?

**Whitnall’s ligament**

What is the eponymous name of this structure?

*Üller* m.

Located on the lateral wall of the orbit is a protuberance known as the lateral orbital tubercle of Whitnall. Is it safe to assume that Whitnall’s ligament attaches to Whitnall’s tubercle?
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**

**Upper-lid Retraction**

*Levator palpebrae superioris* m.

*Hold the phone. Given that it originates at the orbital apex, how is it the levator elevates the upper lid? That is, why*

*Located on the lateral wall of the orbit is a protuberance known as the lateral orbital tubercle of Whitnall. Is it safe to assume that Whitnall’s ligament attaches to Whitnall’s tubercle?*

*You’d think so, but no. The lateral aspect of Whitnall’s ligament passes through the lacrimal gland to insert on the lateral orbital wall a mm or two above Whitnall’s tubercle. What is the eponymous name of this structure?*

*Whitnall’s ligament*
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involuntional entropion, lower-lid involuntional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris* m.

Hold the phone. Given that it originates at the orbital apex, how is it the levator elevates the upper lid? That is, why doesn’t contraction of the levator pull the upper lid margin back, ie, into the orbit? It’s because, on its way to the tarsal plate, the levator complex interacts with an orbital structure which acts as a pulley or fulcrum to change the direction of the force-vector of the levator from anterior-posterior to superior-inferior.

What is the eponymous name of this structure?

*Whitnall’s ligament*

Located on the lateral wall of the orbit is a protuberance known as the lateral orbital tubercle of Whitnall. Is it safe to assume that Whitnall’s ligament attaches to Whitnall’s tubercle?

You’d think so, but no. The lateral aspect of Whitnall’s ligament passes through the lacrimal gland to insert on the lateral orbital wall a mm or two above Whitnall’s tubercle.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors: BOTH

OK then—if not Whitnall’s ligament, what does attach to the lateral orbital tubercle of Whitnall? 

Levator aponeurosis

Müller m.

Superior tarsal plate

What is the eponymous name of this structure?

Whitnall’s ligament
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **eyelid retractors**

OK then—if not Whitnall’s ligament, what does attach to the lateral orbital tubercle of Whitnall?
The attachments are the ‘4 Ls’:

- The lateral horn of the levator aponeurosis
- The lateral canthal tendon
- The check ligament of the lateral rectus muscle
- And one more

What is the eponymous name of this structure?

Whitnall’s ligament

Hold the phone. Given that it originates at the orbital apex, how is it the levator elevates the upper lid? That is, why doesn’t contraction of the levator pull the upper lid margin back, ie, into the orbit?

It’s because, on its way to the tarsal plate, the levator complex interacts with an orbital structure which acts as a pulley or fulcrum to change the direction of the force-vector of the levator from anterior-posterior to superior-inferior. What is the eponymous name of this structure?

Whitnall’s ligament

Located on the lateral wall of the orbit is a protuberance known as the lateral orbital tubercle of Whitnall. Is it safe to assume that Whitnall’s ligament attaches to Whitnall’s tubercle?

You’d think so, but no. The lateral aspect of Whitnall’s ligament passes through the lacrimal gland to insert on the lateral orbital wall a mm or two above Whitnall’s tubercle.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **eyelid retractors**

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**OK then—if not Whitnall’s ligament, what does attach to the lateral orbital tubercle of Whitnall?**

The attachments are the ‘4 Ls’:
- The **L**ateral horn of the **L**evator aponeurosis
- The **L**ateral canthal tendon
- The check **L**igament of the **L**ateral rectus muscle
- And one more **L** we will get to shortly…

- **Levator aponeurosis**
- **Müller m.**
- **Superior tarsal plate**

**Hold the phone. Given that it originates at the orbital apex, how is it the levator elevates the upper lid? That is, why doesn’t contraction of the levator pull the upper lid margin back, ie, into the orbit?**

It’s because, on its way to the tarsal plate, the levator complex interacts with an orbital structure which acts as a pulley or fulcrum to change the direction of the force-vector of the levator from anterior-posterior to superior-inferior.

What is the eponymous name of this structure? **Whitnall’s ligament**
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional *entropion*, lower-lid involutional *ectropion*, or *both*:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **eyelid retractors**

OK then—if not Whitnall’s ligament, what does attach to the lateral orbital tubercle of Whitnall?

The attachments are the ‘4 Ls’:
- The lateral horn of the levator aponeurosis
- The lateral canthal tendon
- The check ligament of the lateral rectus muscle
- And one more *L* we will get to shortly…

Speaking of the lacrimal gland…It is divided into palpebral and orbital lobes by a ligamentous structure. Is that structure the lateral aspect of Whitnall’s ligament?

You’d think so, but no. The lateral aspect of Whitnall’s ligament passes through the lacrimal gland and insert on the lateral orbital wall a mm or two above Whitnall’s tubercle.

What is the eponymous name of this structure?

Whitnall’s ligament
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**

**Involutional Entropion vs Involutional Ectropion**

Levator palpebrae superioris m.

Hold the phone. Given that it originates at the orbital apex, how is it the levator elevates the upper lid? That is, why doesn’t contraction of the levator pull the upper lid margin back, ie, into the orbit? It’s because, on its way to the tarsal plate, the levator complex interacts with an orbital structure which acts as a pulley or fulcrum to change the direction of the force-vector of the levator from anterior-posterior to superior-inferior. What is the eponymous name of this structure?

**Whitnall’s ligament**

Superior tarsal plate

Ok then—if not Whitnall’s ligament, what does attach to the lateral orbital tubercle of Whitnall?

The attachments are the ‘4 L’s’:

- The lateral horn of the levator aponeurosis
- The lateral canthal tendon
- The check ligament of the lateral rectus muscle
- And one more L we will get to shortly…

Speaking of the lacrimal gland... It is divided into palpebral and orbital lobes by a ligamentous structure. Is that structure the lateral aspect of Whitnall’s ligament?

No, the ligamentous structure that divides the lac gland into lobes is the lateral horn of Whitnall. Is it safe to assume that Whitnall’s ligament attaches to Whitnall’s tubercle?

You’d think so, but no. The lateral aspect of Whitnall’s ligament passes through the lacrimal gland to insert on the lateral orbital wall a mm or two **above** Whitnall’s tubercle.

What is the eponymous name of this structure?

**Whitnall’s ligament**

**Levator palpebrae superioris m.**
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**

OK then—if not Whitnall’s ligament, what does attach to the lateral orbital tubercle of Whitnall?

The attachments are the ‘4 Ls’:

- The lateral horn of the levator aponeurosis
- The lateral canthal tendon
- The check ligament of the lateral rectus muscle
- ...and one more L we will get to shortly...

Speaking of the lacrimal gland…It is divided into palpebral and orbital lobes by a ligamentous structure. Is that structure the lateral aspect of Whitnall’s ligament?

No, the ligamentous structure that divides the lac gland into lobes is the lateral horn of the levator aponeurosis.

Levator aponeurosis

↓

Müller m.

↓

Superior tarsal plate

What is the eponymous name of this structure?

Whitnall’s ligament
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional \textit{entropion}, lower-lid involutional \textit{ectropion}, or both:

- Horizontal lid laxity: \textit{BOTH}
- Disinsertion of the eyelid retractors

### Upper-lid Retraction

\textit{Levator palpebrae superioris} m.

- Whitnall’s ligament
- Levator aponeurosis
- \textit{Müller} m.
- Superior tarsal plate

\textit{Now that we’ve reviewed upper-lid retraction, let’s turn our attention to the less-familiar anatomy of lower-lid retraction}
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

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**Upper-lid Retraction**

*Levator palpebrae superioris* m.

- Whitnall’s ligament
- Levator aponeurosis
- *Müller* m.
- Superior tarsal plate

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**Lower-lid Retraction**

What lower-lid structure is analogous to the superior tarsal plate?
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors: BOTH

**Upper-lid Retraction**

*Levator palpebrae superioris* m.

- Whitnall’s ligament
- Levator aponeurosis
- *Müller* m.
- Superior tarsal plate

**Inferior tarsal plate**

*What lower-lid structure is analogous to the superior tarsal plate?*

Hurr durr, the *inferior* tarsal plate

**Lower-lid Retraction**
Q

For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris m.*

- Whitnall's ligament
- *Müller m.*

**Inferior tarsal plate**

*How does the inferior tarsal plate compare to the superior in terms of size?*

- Hurr durr, the inferior tarsal plate
- *Superior tarsal plate*

**Lower-lid Retraction**
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**

---

**Upper-lid Retraction**

*Levator palpebrae superioris m.*

**Inferior tarsal plate**

*Hurr durr, the inferior tarsal plate*

How does the inferior tarsal plate compare to the superior in terms of size? Like the superior, the inferior is about 30 mm long, and about 1 mm thick.

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**Lower-lid Retraction**

*Whitnall's ligament*
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutorial entropion, lower-lid involutorial ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris* m.

[Diagram showing Whitnall's ligament, Müller m., and Superior tarsal plate]

**Inferior tarsal plate**

*How does the inferior tarsal plate compare to the superior in terms of size?*

Like the superior, the inferior is about 30 mm long, and about 1 mm thick.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris m.*

**Inferior tarsal plate**

**How does the inferior tarsal plate compare to the superior in terms of size?**

Like the superior, the inferior is about 30 mm long, and about 1 mm thick. However, the inferior is only about % as tall as the superior (# vs # mm)
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

*Levator palpebrae superioris m.*

**Inferior tarsal plate**

*Whitnall’s ligament*

*Levator aponeurosis*

*Müller’s m.*

*Superior tarsal plate*

**Lower-lid Retraction**

_How does the inferior tarsal plate compare to the superior in terms of size?_

Like the superior, the inferior is about 30 mm long, and about 1 mm thick. However, the inferior is only about 1/3 as tall as the superior (4 vs 12 mm)
Involutional Entropion vs Involutional Ectropion

Tarsal plates
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

- *Levator palpebrae superioris* m.
- Whitnall’s ligament
- Levator aponeurosis
- Superior tarsal plate

**Inferior tarsal plate**

What lower-lid structure is analogous to the *levator palpebrae superioris*?

**Lower-lid Retraction**

- ???
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

Upper-lid Retraction

*Levator palpebrae superioris* m.

Whitnall’s ligament

Levator aponeurosis

Superior tarsal plate

What lower-lid structure is analogous to the levator palpebrae superioris? **There is none.** There is no skeletal (ie, striated) muscle involved in lower-lid retraction.

Lower-lid Retraction

Inferior tarsal plate

???
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

- *Levator palpebrae superioris* m.
- Whitnall’s ligament
- Levator aponeurosis
- Superior tarsal plate

**Inferior tarsal plate**

*What lower-lid structure is analogous to the levator palpebrae superioris?*

*There is none.* There is no skeletal (i.e., striated) muscle involved in lower-lid retraction. Further, the lower-lid retraction complex doesn’t originate with a muscle.

**Lower-lid Retraction**
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

- *Levator palpebrae superioris* m.
- Whitnall’s ligament
- *Levator aponeurosis*
- Superior tarsal plate

**Inferior tarsal plate**

What lower-lid structure is analogous to the levator palpebrae superioris? There is none. There is no skeletal (ie, striated) muscle involved in lower-lid retraction. Further, **the lower-lid retraction complex doesn’t originate with a muscle.**

If not a muscle, from what does the lower-lid retractor complex originate?

???
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

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**Upper-lid Retraction**

- *Levator palpebrae superioris* m.
- Whitnall’s ligament
- *Levator aponeurosis*
- Superior tarsal plate

**Inferior tarsal plate**

*What lower-lid structure is analogous to the* *levator palpebrae superioris*?

*There is none.* There is no skeletal (ie, striated) muscle involved in lower-lid retraction. Further, the lower-lid retraction complex doesn’t originate with a muscle.

*If not a muscle, from what does the lower-lid retractor complex originate?*

*From the* **capsulopalpebral head**

*Capsulopalpebral head*

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**Lower-lid Retraction**
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional **entropion**, lower-lid involutional **ectropion**, or **both**:  
- Horizontal lid laxity: **BOTH**  
- Disinsertion of the eyelid retractors: **BOTH**

**Upper-lid Retraction**

*Levator palpebrae superioris m.*

- Whitnall’s ligament
- Levator aponeurosis
- **Müller** muscle
- Superior tarsal plate

**Lower-lid Retraction**

- Inferior tarsal plate
- Capsulopalpebral head

**Is there a lower-lid equivalent of Müeller’s muscle?**

There is. The **inferior tarsus muscle** is a collection of smooth-muscle fibers innervated by sympathetics. (It is not nearly as well developed as Müeller’s, however.)
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

Upper-lid Retraction

\[ \text{Levator palpebrae superioris m.} \]

- Whitnall’s ligament
- Levator aponeurosis
- \( \text{Müller muscle} \)
- Superior tarsal plate

Inferior tarsal plate

Is there a lower-lid equivalent of Müeller’s muscle?

There is. The muscle is a collection of smooth-muscle fibers innervated by sympathetics. (It is not nearly as well developed as Müeller’s, however.)

Capsulopalpebral head

Lower-lid Retraction
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional *entropion*, lower-lid involutional *ectropion*, or both:

- Horizontal lid laxity
- Disinsertion of the eyelid retractors

Is there a lower-lid equivalent of Müeller’s muscle? There is. The *inferior tarsus* muscle is a collection of smooth-muscle fibers innervated by sympathetics. (It is not nearly as well developed as Müeller’s, however.)
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors

Upper-lid Retraction

Levator palpebrae superioris m.

Levator aponeurosis

Mueller m.

Superior tarsal plate

Whitnall’s ligament

What is the lower-lid analogue for the levator aponeurosis?

Inferior tarsal plate

Inferior tarsal muscle

Capsulopalpebral head

Lower-lid Retraction
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional *entropion*, lower-lid involutional *ectropion*, or *both*:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

- *Levator palpebrae superioris* m.
- Whitnall’s ligament
- Levator aponeurosis
- *Müller* m.
- Superior tarsal plate

**Lower-lid Retraction**

- Inferior tarsal plate
- Capsulopalpebral fascia
- *Inferior tarsal muscle*
- Capsulopalpebral head

*What is the lower-lid analogue for the levator aponeurosis? It is called the capsulopalpebral fascia (not to be confused with the capsulopalpebral head with which it is associated)*
Involutional Entropion
VS
Involutional Ectropion

Capsulopalpebral fascia
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors: pick up

**Upper-lid Retraction**

*Levator palpebrae superioris m.*

- Whitnall’s ligament
- Levator aponeurosis
- *Müller* m.
- Superior tarsal plate

**Lower-lid Retraction**

- Inferior tarsal plate
- Capsulopalpebral fascia
- *Inferior tarsal muscle*
- Capsulopalpebral head

And as was the case in the upper lid, is there an orbital structure that redirects the force-vector of the lower-lid retractors from A-P to superior-inferior, ie, is there a lower-lid analogue to Whitnall’s ligament?
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

As was the case in the upper lid, is there an orbital structure that redirects the force-vector of the lower-lid retractors from A-P to superior-inferior, i.e., is there a lower-lid analogue to Whitnall’s ligament?

Indeed there is!
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

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**Upper-lid Retraction**

*Levator palpebrae superioris* m.

- Whitnall’s ligament
- *Müller* m.
- Superior tarsal plate

**Inferior tarsal plate**

- Capsulopalpebral fascia

**Inferior tarsal muscle**

- Capsulopalpebral head

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**Lower-lid Retraction**

*What is the name of this structure?*
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional \textit{entropion}, lower-lid involutional \textit{ectropion}, or \textit{both}:

- Horizontal lid laxity: \textbf{BOTH}
- Disinsertion of the eyelid retractors

**Upper-lid Retraction**

- \textit{Levator palpebrae superioris} m.
- Whitnall’s ligament
  - Levator aponeurosis
    - \textit{Müller} m.
    - Superior tarsal plate

**Inferior tarsal plate**
- Capsulopalpebral fascia
  - Lockwood’s ligament
    - \textit{Inferior tarsal} muscle
      - Capsulopalpebral head

**Lower-lid Retraction**

\textit{What is the name of this structure?}
Involutional **Entropion**

VS

Involutional **Ectropion**

Lockwood’s ligament
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors

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**Upper-lid Retraction**

- Levator palpebrae superioris m.
- Whitnall’s ligament
- Levator aponeurosis
- Müeller m.
- Superior tarsal plate

**Inferior tarsal plate**

- Capsulopalpebral fascia
- Lockwood’s ligament
- Müller’s ligament
- Capsulopalpebral head

To what does Lockwood’s ligament attach in the lateral orbit? (You think you don’t know, but you do.)
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**

OK then—if not Whitnall’s ligament, what does attach to the lateral orbital tubercle of Whitnall?

The attachments are the ‘4 Ls’:
- The **L**ateral horn of the **L**evator aponeurosis
- The **L**ateral canthal tendon
- The check **L**igament of the **L**ateral rectus muscle
- **Lockwood’s ligament**

To what does Lockwood’s ligament attach in the lateral orbit? (You think you don’t know, but you do.)

To Whitnall’s tubercle (it’s the fourth ‘L’ alluded to previously)
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**

**Upper-lid Retraction**

- *Levator palpebrae superioris* m.
- Whitnall’s ligament
- Levator aponeurosis
- *Müller* m.
- Superior tarsal plate

**Lower-lid Retraction**

- Inferior tarsal plate
- Capsulopalpebral fascia
- Lockwood’s ligament
- *Inferior tarsal* muscle
- Capsulopalpebral head

*Review slide—no question*
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors

(OK, now we’re ready to answer this question)
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**

*(OK, now we’re ready to answer this question)*
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional \textit{entropion}, lower-lid involutional \textit{ectropion}, or both:

- Horizontal lid laxity \textbf{BOTH}
- \textbf{Disinsertion} of the eyelid retractors \textbf{BOTH}

Other than entropion or ectropion, what signs might be present that would suggest the lower-lid retractors have disinserted?

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For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity **BOTH**
- **Disinsertion** of the eyelid retractors **BOTH**

*Other than entropion or ectropion, what signs might be present that would suggest the lower-lid retractors have disinserted?*

-- The lower-lid margin might be riding high (aka reverse ptosis).
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity
  - **BOTH**

- **Disinsertion** of the eyelid retractors
  - **BOTH**

*Other than entropion or ectropion, what signs might be present that would suggest the lower-lid retractors have disinserted?*

--The lower-lid margin might be riding high (aka **reverse ptosis**)
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional *entropion*, lower-lid involutional *ectropion*, or *both*:

- Horizontal lid laxity **BOTH**
- **Disinsertion** of the eyelid retractors **BOTH**

*Other than entropion or ectropion, what signs might be present that would suggest the lower-lid retractors have disinserted?*

-- The lower-lid margin might be riding high (aka *reverse ptosis*)
-- The failure of the lower lid to retract during downgaze
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity **BOTH**
- **Disinsertion** of the eyelid retractors **BOTH**

*Other than entropion or ectropion, what signs might be present that would suggest the lower-lid retractors have disinserted?*

---
- The lower-lid margin might be riding high (aka **reverse ptosis**)  
- The failure of the lower lid to retract during **downgaze**
Q

For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity **BOTH**
- **Disinsertion** of the eyelid retractors **BOTH**

Other than entropion or ectropion, what signs might be present that would suggest the lower-lid retractors have disinserted?

--The lower-lid margin might be riding high (aka **reverse ptosis**)
--The failure of the lower lid to retract during **downgaze**
--The presence of a **white line** beneath the conjunctiva mm or two below the inferior border of the tarsal plate
A

For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional _entropion_, lower-lid involutional _ectropion_, or both:

- Horizontal lid laxity **BOTH**
- **Disinsertion** of the eyelid retractors **BOTH**

*Other than entropion or ectropion, what signs might be present that would suggest the lower-lid retractors have disinserted?*

--- The lower-lid margin might be riding high (aka **reverse ptosis**)  
--- The failure of the lower lid to retract during **downgaze**  
--- The presence of a **white line** beneath the conjunctiva or two below the inferior border of the tarsal plate
Involutional Entropion vs Involutional Ectropion

Patient with entropion of the right lower eyelid. Green arrow demonstrates the “white line.”
Q

For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional *entropion*, lower-lid involutional *ectropion*, or *both*:

- Horizontal lid laxity **BOTH**
- **Disinsertion** of the eyelid retractors **BOTH**

*Other than entropion or ectropion, what signs might be present that would suggest the lower-lid retractors have disinserted?*

-- The lower-lid margin might be riding high (aka **reverse ptosis**)  
-- The failure of the lower lid to retract during **downgaze**  
-- The presence of a **white line** beneath the conj a mm or two below the inferior border of the tarsal plate; this line is in fact the...
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- **Disinsertion** of the eyelid retractors: **BOTH**

Other than entropion or ectropion, what signs might be present that would suggest the lower-lid retractors have disinserted?
- The lower-lid margin might be riding high (aka **reverse ptosis**)
- The failure of the lower lid to retract during **downgaze**
- The presence of a **white line** beneath the conj a mm or two below the inferior border of the tarsal plate; this line is in fact the leading edge of the detached retractors
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**

Other than entropion or ectropion, what signs might be present that would suggest the lower-lid retractors have disinserted?

- The lower-lid margin might be riding high (aka **reverse ptosis**)
- The failure of the lower lid to retract during downgaze
- The presence of a white line beneath the conjunct or two below the inferior border of the tarsal plate; this line is in fact the leading edge of the detached retractors

I see how disinsertion of the retractors would lead to elevation of the lower-lid margin, but how might it contribute to rotation of the margin?
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**

Other than entropion or ectropion, what signs might be present that would suggest the lower-lid retractors have disinserted?

- The lower-lid margin might be riding high (aka **reverse ptosis**)
- The failure of the lower lid to retract during downgaze
- The presence of a white line beneath the conjunctiva or two below the inferior border of the tarsal plate; this line is in fact the leading edge of the detached retractors

*I see how disinsertion of the retractors would lead to elevation of the lower-lid margin, but how might it contribute to rotation of the margin?*

In this regard, it’s important to note that, like the levator aponeurosis in the upper lid, the capsulopalpebral fascia does not insert solely onto the tarsal plate; rather, it sends tendrils to the skin and orbicularis overlying the plate. Thus, in addition to keeping the inferior tarsal plate from riding up, the retractor also keeps it from riding out, ie, away from the globe.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors: BOTH

Other than entropion or ectropion, what signs might be present that would suggest the lower-lid retractors have disinserted?

- The lower-lid margin might be riding high (aka reverse ptosis)
- The failure of the lower lid to retract during downgaze
- The presence of a white line beneath the conjunctiva or two below the inferior border of the tarsal plate; this line is in fact the leading edge of the detached retractors

I see how disinsertion of the retractors would lead to elevation of the lower-lid margin, but how might it contribute to rotation of the margin?

In this regard, it’s important to note that, like the levator aponeurosis in the upper lid, the capsulopalpebral fascia does not insert solely onto the tarsal plate; rather, it sends tendrils to the skin and orbicularis overlying the plate. Thus, in addition to keeping the inferior tarsal plate from riding up, the retractor also keeps it from riding out, ie, away from the globe. You can imagine how, when coupled with horizontal lid laxity, allowing the inferior margin of the tarsal plate to drift away from the globe would let its upper margin rotate in (or out).
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**
- Enophthalmos due to loss of orbital fat as part of the normal aging process
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**
- Enophthalmos due to loss of orbital fat as part of the normal aging process: **BOTH**
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**
- **Enophthalmos** due to loss of orbital fat as part of the normal aging process: **BOTH**

How does enophthalmos contribute to lower-lid malpositioning?
Involutional Entropion vs Involutional Ectropion

- For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:
  - Horizontal lid laxity: **BOTH**
  - Disinsertion of the eyelid retractors: **BOTH**
  - **Enophthalmos** due to loss of orbital fat as part of the normal aging process: **BOTH**

*How does enophthalmos contribute to lower-lid malpositioning?*

It’s pretty straightforward. If the globe is sitting deeper in the orbit, it follows that its apposition against the lid will be less robust, which will in turn increase ‘slack’ in the lid.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional *entropion*, lower-lid involutional *ectropion*, or *both*:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**
- **Enophthalmos** due to loss of orbital fat as part of the normal aging process: **BOTH**

*How does enophthalmos contribute to lower-lid malpositioning?*

It’s pretty straightforward. If the globe is sitting deeper in the orbit, it follows that its apposition against the lid will be less robust, which will in turn increase ‘slack’ in the lid. And anything that contributes to lid laxity increases the likelihood that lid-margin malpositioning will occur.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors: BOTH
- Enophthalmos due to loss of orbital fat as part of the normal aging process: BOTH
- Override of the preseptal orbicularis
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**
- Enophthalmos due to loss of orbital fat as part of the normal aging process: **BOTH**
- Override of the preseptal orbicularis

Before we answer this question, let’s review the anatomy of the orbicularis muscle.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors: BOTH
- Enophthalmos due to loss of orbital fat as part of the normal aging process: BOTH
- Override of the preseptal orbicularis

What is the basic arrangement of the fibers of the orbicularis?
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors: BOTH
- Enophthalmos due to loss of orbital fat as part of the normal aging process: BOTH
- Override of the preseptal orbicularis

What is the basic arrangement of the fibers of the orbicularis?
As multiple concentric bands encircling all or part of the orbital aperture
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors: BOTH
- Enophthalmos due to loss of orbital fat as part of the normal aging process: BOTH
- Override of the preseptal orbicularis

What is the basic arrangement of the fibers of the orbicularis? As multiple concentric bands encircling all or part of the orbital aperture

The ‘multiple bands’ are organized into two basic portions—what are they?

--?
--?
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors: BOTH
- Enophthalmos due to loss of orbital fat as part of the normal aging process: BOTH
- Override of the preseptal orbicularis

What is the basic arrangement of the fibers of the orbicularis?
As multiple concentric bands encircling all or part of the orbital aperture

The ‘multiple bands’ are organized into two basic portions—what are they?

--Orbital
--Palpebral
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**
- Enophthalmos due to loss of orbital fat as part of the normal aging process: **BOTH**
- Override of the preseptal orbicularis

**What is the basic arrangement of the fibers of the orbicularis?**
As multiple concentric bands encircling all or part of the orbital aperture

**The ‘multiple bands’ are organized into two basic portions—what are they?**

- Orbital
- Palpebral

There’s a fundamental functional distinction between the orbital and palpebral portions. What is it?
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**
- Enophthalmos due to loss of orbital fat as part of the normal aging process: **BOTH**
- Override of the preseptal orbicularis

What is the basic arrangement of the fibers of the orbicularis?
As multiple concentric bands encircling all or part of the orbital aperture

The ‘multiple bands’ are organized into two basic portions—what are they?

-- Orbital
-- Palpebral

There’s a fundamental functional distinction between the orbital and palpebral portions. What is it?
The palpebral portion is responsible for normal blinking, whereas the orbital portion comes into play only during effortful/voluntary eye closure
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity **BOTH**
- Disinsertion of the eyelid retractors **BOTH**
- Enophthalmos due to loss of orbital fat as part of the normal aging process **BOTH**
- Override of the preseptal orbicularis

**What is the basic arrangement of the fibers of the orbicularis?**
As multiple concentric bands encircling all or part of the orbital aperture

*The ‘multiple bands’ are organized into two basic portions—what are they? How are they defined?*

--- Orbital: ?
--- Palpebral: ?
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional *entropion*, lower-lid involutional *ectropion*, or *both*:

- Horizontal lid laxity **BOTH**
- Disinsertion of the eyelid retractors **BOTH**
- Enophthalmos due to loss of orbital fat as part of the normal aging process **BOTH**
- Override of the preseptal orbicularis

What is the basic arrangement of the fibers of the orbicularis?
As multiple concentric bands encircling all or part of the orbital aperture

The ‘multiple bands’ are organized into two basic portions—what are they? **How are they defined?**

-- Orbital: The portion overlying orbital bone
-- Palpebral: The portion overlying the lids
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors: BOTH
- Enophthalmos due to loss of orbital fat as part of the normal aging process: BOTH
- Override of the preseptal orbicularis

What is the basic arrangement of the fibers of the orbicularis?
As multiple concentric bands encircling all or part of the orbital aperture

The ‘multiple bands’ are organized into two basic portions—what are they?
How are they defined? The palpebral portion is further subdivided into two parts—what are they?
--Orbital: The portion overlying orbital bone
--Palpebral: The portion overlying the lids
----?
----?
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**
- Enophthalmos due to loss of orbital fat as part of the normal aging process: **BOTH**
- Override of the preseptal orbicularis

What is the basic arrangement of the fibers of the orbicularis?
As multiple concentric bands encircling all or part of the orbital aperture

The ‘multiple bands’ are organized into two basic portions—what are they?

How are they defined? The palpebral portion is further subdivided into two parts—what are they?

--- Orbital: The portion overlying orbital bone
--- Palpebral: The portion overlying the lids
---- Preseptal
---- Pretarsal
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional **entropion**, lower-lid involutional **ectropion**, or **both**:

- Horizontal lid laxity **BOTH**
- Disinsertion of the eyelid retractors **BOTH**
- Enophthalmos due to loss of orbital fat as part of the normal aging process **BOTH**
- Override of the preseptal orbicularis

**What is the basic arrangement of the fibers of the orbicularis?**
As multiple concentric bands encircling all or part of the orbital aperture

The ‘multiple bands’ are organized into two basic portions—what are they? **How are they defined?** The palpebral portion is further subdivided into two parts—what are they? **How are they defined?**

-- Orbital: The portion overlying orbital bone
-- Palpebral: The portion overlying the lids
---- Preseptal: ?
---- Pretarsal: ?
A

For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors: BOTH
- Enophthalmos due to loss of orbital fat as part of the normal aging process: BOTH
- Override of the preseptal orbicularis

What is the basic arrangement of the fibers of the orbicularis?
As multiple concentric bands encircling all or part of the orbital aperture

The ‘multiple bands’ are organized into two basic portions—what are they? How are they defined? The palpebral portion is further subdivided into two parts—what are they? How are they defined?

---Orbital: The portion overlying orbital bone
---Palpebral: The portion overlying the lids
---Preseptal: The part overlying the orbital septum
---Pretarsal: The part overlying the tarsal plates
Involutional Entropion vs Involutional Ectropion

Orbicularis oculi
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involitional entropion, lower-lid involitional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors: BOTH
- Enophthalmos due to loss of orbital fat as part of the normal aging process: BOTH
- Override of the preseptal orbicularis

What is the basic arrangement of the fibers of the orbicularis?
As multiple concentric bands encircling all or part of the orbital aperture

There is a special slip of pretarsal orbicularis that is located at the surface of the lid margin. What is the eponymous name?

Preseptal: The part overlying the orbital septum
Pretarsal: The part overlying the tarsal plates
A

For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors: BOTH
- Enophthalmos due to loss of orbital fat as part of the normal aging process: BOTH
- Override of the preseptal orbicularis

What is the basic arrangement of the fibers of the orbicularis?
As multiple concentric bands encircling all or part of the orbital aperture

There is a special slip of pretarsal orbicularis that is located at the surface of the lid margin. What is the eponymous name?
The muscle of Riolan

---- Preseptal: The part overlying the orbital septum
---- Pretarsal: The part overlying the tarsal plates
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: BOTH
- Disinsertion of the eyelid retractors: BOTH
- Enophthalmos due to loss of orbital fat as part of the normal aging process: BOTH
- Override of the preseptal orbicularis

What is the basic arrangement of the fibers of the orbicularis?
As multiple concentric bands encircling all or part of the orbital aperture

There is a special slip of pretarsal orbicularis that is located at the surface of the lid margin. What is the eponymous name?
The muscle of Riolan

What is its appearance-based, non-eponymous name?

--- Preseptal: The part overlying the orbital septum
--- Pretarsal: The part overlying the tarsal plates
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**
- Enophthalmos due to loss of orbital fat as part of the normal aging process: **BOTH**
- Override of the preseptal orbicularis: **BOTH**

What is the basic arrangement of the fibers of the orbicularis?
As multiple concentric bands encircling all or part of the orbital aperture

There is a special slip of pretarsal orbicularis that is located at the surface of the lid margin. What is the eponymous name?
The muscle of Riolan

What is its appearance-based, non-eponymous name?
The gray line

--- Preseptal: The part overlying the orbital septum
--- Pretarsal: The part overlying the tarsal plates
Involutional Entropion vs Involutional Ectropion

Muscle of Riolan
(aka the gray line)
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional *entropion*, lower-lid involutional *ectropion*, or *both*:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**
- Enophthalmos due to loss of orbital fat as part of the normal aging process: **BOTH**
- Override of the preseptal orbicularis

*(OK, now we’re ready to answer it)*
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional *entropion*, lower-lid involutional *ectropion*, or *both*:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**
- Enophthalmos due to loss of orbital fat as part of the normal aging process: **BOTH**
- Override of the preseptal orbicularis: **ENTROPION ONLY**

*(OK, now we’re ready to answer it)*
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutionsal *entropion*, lower-lid involutionsal *ectropion*, or *both*:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**
- Enophthalmos due to loss of orbital fat as part of the normal aging process: **BOTH**
- **Override of the preseptal orbicularis**: **ENTROPION ONLY**

Let’s unpack this, because it’s really important. What does it mean to say the preseptal orbicularis ‘overrides’? Overrides what?
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**
- Enophthalmos due to loss of orbital fat as part of the normal aging process: **BOTH**
- **Override** of the preseptal orbicularis: **ENTROPION ONLY**

Let’s unpack this, because it’s really important. What does it mean to say the preseptal orbicularis ‘overrides’? Overrides what?

It overrides the pretarsal orbicularis, ie, it slips up from its normal anatomic location below (inferior to) the pretarsal portion to lie atop or even above it.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity **BOTH**
- Disinsertion of the eyelid retractors **BOTH**
- Enophthalmos due to loss of orbital fat as part of the normal aging process **BOTH**
- **Override of the preseptal orbicularis** **ENTROPION ONLY**

Let’s unpack this, because it’s really important. What does it mean to say the preseptal orbicularis ‘overrides’? Overrides what?

It overrides the pretarsal orbicularis, ie, it slips up from its normal anatomic location below (inferior to) the pretarsal portion to lie atop or even above it

**OK, but how does override lead to entropion?**
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**
- Enophthalmos due to loss of orbital fat as part of the normal aging process: **BOTH**
- **Override of the preseptal orbicularis**

Let’s unpack this, because it’s really important. What does it mean to say the preseptal orbicularis ‘overrides’? Overrides what?

It overrides the pretarsal orbicularis, ie, it slips up from its normal anatomic location below (inferior to) the pretarsal portion to lie atop or even above it.

**OK, but how does override lead to entropion?**

Recall that these fibers are adherent to the preseptal skin overlying them. Thus, when these fibers ride up and over the tarsal plate, they bring with them tissue that belongs below the plate.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity: **BOTH**
- Disinsertion of the eyelid retractors: **BOTH**
- Enophthalmos due to loss of orbital fat as part of the normal aging process: **BOTH**
- **Override of the preseptal orbicularis**: **ENTROPION ONLY**

Let’s unpack this, because it’s really important. What does it mean to say the preseptal orbicularis ‘overrides’? Overrides what?

It overrides the pretarsal orbicularis, ie, it slips up from its normal anatomic location below (inferior to) the pretarsal portion to lie atop or even above it.

**OK, but how does override lead to entropion?**

Recall that these fibers are adherent to the preseptal skin overlying them. Thus, when these fibers ride up and over the tarsal plate, they bring with them tissue that belongs below the plate. This leads to the inferior border of the tarsal plate rotating **out**, and causes the superior border to rotate **in**.
Involutional Entropion VS Involutional Ectropion

(A) Normal lower eyelid anatomy. The retractors pull the lower margin of the tarsus inferiorly and posteriorly, stabilizing the eyelid.
**Involutional Entropion vs Involutional Ectropion**

(A) Normal lower eyelid anatomy. The retractors pull the lower margin of the tarsus inferiorly and posteriorly, stabilizing the eyelid.

(B) Involutional entropion. Note that the retractors are detached from the tarsus. The preseptal orbicularis is riding up and over the pretarsal portion, in the process inverting the lid margin.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity
- Disinsertion of the eyelid retractors
- Enophthalmos due to loss of orbital fat as part of the normal aging process

The takeaway point: Involutional entropion and ectropion of the lower lid have very similar pathogeneses.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity
- Disinsertion of the eyelid retractors
- Enophthalmos due to loss of orbital fat as part of the normal aging process
- Override of the preseptal orbicularis?

The takeaway point: Involutional entropion and ectropion of the lower lid have very similar pathogeneses. The determining factor re whether an individual will develop one vs the other is the status of the preseptal orbicularis.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

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- Disinsertion of the eyelid retractors
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- Override of the preseptal orbicularis? NO

**The takeaway point:** Involutional entropion and ectropion of the lower lid have very similar pathogeneses. The determining factor re whether an individual will develop one vs the other is the status of the preseptal orbicularis. If it doesn’t override the lid margin, the lid will flop outward, and the pt will have ectropion.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity
- Disinsertion of the eyelid retractors
- Enophthalmos due to loss of orbital fat as part of the normal aging process
- **Override of the preseptal orbicularis?** YES

**Involutional Entropion vs Involutional Ectropion**

**The takeaway point:** Involutional entropion and ectropion of the lower lid have very similar pathogeneses. The determining factor re whether an individual will develop one vs the other is the status of the preseptal orbicularis. If it doesn't override the lid margin, the lid will flop outward, and the pt will have ectropion. But if the preseptal orbicularis does override the lid margin, the margin will turn inward, resulting in entropion.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity?
- Disinsertion of the eyelid retractors?
- Enophthalmos due to loss of orbital fat as part of the normal aging process?
- Override of the preseptal orbicularis?

Which of these play a role in the pathogenesis of upper-lid involutional entropion/ectropion?
For each of the following, state whether it plays a role in the pathogenesis of upper-lid involutinal entropion, lower-lid involutinal ectropion, or both:

- Horizontal lid laxity
- Disinsertion of the eyelid retractors?
- Enophthalmos due to loss of orbital fat as part of the normal aging process?
- Override of the preseptal orbicularis?

Which of these play a role in the pathogenesis of upper-lid involutinal entropion/ectropion? Trick question. The upper lid is generally not subject to involutinal changes of the sort that alter the configuration of the lid margin.
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutional entropion, lower-lid involutional ectropion, or both:

- Horizontal lid laxity?
- Disinsertion of the eyelid retractors?
- Enophthalmos due to loss of orbital fat as part of the normal aging process?
- Override of the preseptal orbicularis?

Which of these play a role in the pathogenesis of upper-lid involutional entropion/ectropion?

**Trick question.** The upper lid is generally not subject to involutional changes of the sort that alter the configuration of the lid margin.

**TL;DR People don’t get upper-lid involutional entropion or ectropion**
For each of the following, state whether it plays a role in the pathogenesis of lower-lid involutinal entropion, lower-lid involutinal ectropion, or both:

- Horizontal lid laxity?
- Disinsertion of the eyelid retractors?
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Which of these play a role in the pathogenesis of upper-lid involutinal entropion/ectropion? Trick question. The upper lid is generally not subject to involutinal changes of the sort that alter the configuration of the lid margin.

TL;DR People don’t get upper-lid involutinal entropion or ectropion

But to be clear, entropion and ectropion 2ndry to other mechanisms can occur in the upper lid
An elderly patient presents with what you diagnose as involutional entropion. What should you do for the patient today?

1)
2)
An elderly patient presents with what you diagnose as involutional entropion. What should you do for the patient *today*?

1) Quickert sutures as a temporizing measure
2) **Schedule ‘em for definitive surgery**
An elderly patient presents with what you diagnose as involutional entropion. What should you do for the patient today?

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What are Quickert (aka Quickert-Rathbun) sutures?

A suturing technique that everts an entropic lid

Preferences vary, but 4-0 silk or chromic work well

Briefly, how are they placed? And how do they work?
The pass starts just below the lash line traveling down and posterior, passing in front of and then below the tarsal plate. It comes out on the conj surface shortly before the inferior fornix. When cinched, the suture torques the inward-curling lid away from the globe.

How many throws are placed?
Usually three
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Quickert sutures
Many surgical approaches to involutional entropion have been developed. However, the most effective approaches address the same two therapeutic goals:

1) 
2)
Many surgical approaches to involutional entropion have been developed. However, the most effective approaches address the same two therapeutic goals:

1) Surgical maneuver to address laxity
2)
Many surgical approaches to involutional entropion have been developed. However, the most effective approaches address the same two therapeutic goals:

1) **Horizontal lid tightening** to address laxity
2)
Many surgical approaches to involutional entropion have been developed. However, the most effective approaches address the same two therapeutic goals:

1) **Horizontal lid tightening** to address laxity
2) Permanent re-insertion of the lower-lid retractors

This is usually accomplished with a **lateral tarsal strip** procedure.
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**Q**

Briefly, how is the lateral tarsal strip procedure performed?

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A lateral canthotomy/inferior cantholysis is performed, and the lateral aspect of the tarsus is exposed by removing from it the anterior and posterior lid lamellae, as well as the mucocutaneous junction at the lid margin.

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Lateral tarsal strip procedure. A, Lateral stretching of the eyelid demonstrates the potential of lower lid tightening. (Note: The is pt has ectropion, not entropion.)
Involutional **Entropion**
VS
Involutional **Ectropion**

**Lateral tarsal strip procedure.**

A, Lateral stretching of the eyelid demonstrates the potential of lower lid tightening. (Note: The is pt has **ectropion**, not entropion.)

B, Lateral tarsal strip procedure: anchoring of tarsal strip to periosteum inside the lateral orbital rim.
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Posterior: Tarsal plate and conjunctiva
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Involutional Entropion vs Involutional Ectropion

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What structures comprise each lamella?

Anterior:

Posterior:
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*Anterior:* Skin and orbicularis muscle  
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Involutional Entropion vs Involutional Ectropion

Eyelid lamellae

Tarsal plate

Posterior lamella

Anterior lamella
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What comprises the dividing line between the two lamellae?
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What comprises the dividing line between the two lamellae? The muscle of Riolan/gray line
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Does the eyelid possess a middle lamella? Yes--both upper and lower lids are conceptualized as possessing a middle lamella. However, the middle lamellae are composed of structures only found beyond the non-marginal edge of the tarsal plate (ie, superior to the upper plate, and inferior to the lower). Thus, at the location of the tarsal plate (as discussed here), there is no middle lamella.

What comprises the dividing line between the two lamellae? The muscle of Riolan/gray line.
Many surgical approaches to involutional entropion have been developed. However, the most effective approaches address the same two therapeutic goals:

1. Horizontal lid tightening to address laxity,
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**A**

Briefly, how is the lateral tarsal strip procedure performed?

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**Middle lamella!**

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Middle lamella!

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The muscle of Riolan/gray line
Many surgical approaches to involutional entropion have been developed. However, the most effective approaches address the same two therapeutic goals:

1) **Horizontal lid tightening** to address laxity, and
2) Surgical maneuver of the lower-lid retractors

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1) **Horizontal lid tightening** to address laxity, and
2) **Permanent re-insertion** of the lower-lid retractors

This is usually accomplished with a **lateral tarsal strip** procedure. This can be done via a skin or a conjunctival incision.
Many surgical approaches to involutional entropion have been developed. However, the most effective approaches address the same two therapeutic goals:

1) Horizontal lid tightening to address laxity, and

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This can be done via a skin or a conjunctival incision; both have advantages. --The chief advantage of the conj approach is…(?)
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--The chief advantage of the **conj** approach is...the incision scar is hidden

--The advantage of the **skin** approach is...the incision scar acts to prevent recurrent orbicularis override, thereby reducing the risk of surgical failure.
As an aside: While lower-lid entropion is usually involutional, *upper*-lid entropion is always not involutional.
● As an aside: While lower-lid entropion is usually involutional, *upper*-lid entropion is always *cicatricial*
As an aside: While lower-lid entropion is usually involutional, upper-lid entropion is always cicatricial.

When you hear ‘upper-lid cicatricial entropion,’ a specific condition—one of the most common causes of blindness worldwide—should come instantly to mind. What is it?
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When you hear ‘upper-lid cicatricial entropion,’ a specific condition—one of the most common causes of blindness worldwide—should come instantly to mind. What is it? Trachoma.
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What is the causative organism in trachoma?

Trachoma
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What is the causative organism in trachoma? 
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What does trachoma rank as a cause of blindness worldwide? It is the most common cause of infectious blindness.

Where is trachoma prevalent? The Middle East, South Asia, Africa.

Is trachoma primarily a follicular, or papillary conjunctivitis? Follicular.

Where do the follicles tend to occur? On the superior palpebral conjunctiva, and the superior limbal region.
As an aside: While lower-lid entropion is usually involutional, upper-lid entropion is always cicatricial.

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Trachoma is prevalent in the Middle East, South Asia, and Africa. It is the most common cause of infectious blindness worldwide.
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Why are they blind, ie, what ocular structure is responsible?
The cornea—it is scarred, and covered by a pannus.

In a nutshell, what sequence of events leads to corneal opacification?
Repeated infections produce scarification of the superior palpebral conjunctiva, and the subsequent cicatricial entropion leads to severe trichiasis which decimates the corneal surface.
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Trachoma: Scarring of tarsal conj (the depicted classic sign is called **Arlt's line**).
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Trachoma: Cicatricial entropion
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- How can you quickly differentiate between involutional and cicatricial entropion?
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How can you quickly differentiate between involutional and cicatricial entropion? Via attempted digital eversion (ie, ‘unrolling’) of the entropion.
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- How does this differentiate between the two?
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- How can you quickly differentiate between involutional and cicatricial entropion?
  Via attempted digital eversion (ie, ‘unrolling’) of the entropion

- How does this differentiate between the two?
  If you can’t roll it out, it’s cicatricial. If you can roll it out, ask the patient to squeeze their eyelids shut. If it’s involutional, the lid will roll back up.
An elderly patient presents with what you diagnose as involutional ectropion. What should you do for the patient today?

1) Reverse Quickert sutures as a temporizing measure
2) Schedule for definitive surgery
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**How are reverse Quickert sutures like regular Quickert sutures, and how are they different?**

Reverse Quickert sutures are **like** regular Quickerts in that both work by temporarily…

1) **Reverse** Quickert sutures are used to manage entropion, and reverse to manage ectropion; and

2) regular Quickerts are usually thrown on the skin side of the lid, whereas reverse Quickerts are thrown on the conj side.
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<table>
<thead>
<tr>
<th>Involutional Entropion</th>
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Managing *involutional* ectropion:

- Mild medial punctal eversion can be successfully treated with a medial spindle procedure.
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*Involutional Entropion* vs *Involutional Ectropion*
Managing *involutional* ectropion:

- Mild medial punctal eversion can be successfully treated with a *medial spindle procedure*.

**Briefly, how is the medial spindle procedure performed?**

A small ‘diamond’ of conjunctiva and underlying tissue is excised about 4 mm below the puncta. The resulting gap is then closed vertically, i.e., the uppermost point of the diamond is apposed to the point directly below it.
Managing *involutional* ectropion:

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*Briefly, how is the medial spindle procedure performed?*

A small ‘diamond’ of conj and underlying tissue is excised about 4 mm below the puncta. The resulting gap is then closed vertically, ie, the uppermost point of the diamond is apposed to the point directly below it. This closure causes the ectropic lid margin superior to the surgical site to roll inward.
Involutional Entropion vs Involutional Ectropion

**Medial spindle procedure**: Outline of excision of conjunctiva and retractors
Managing *involutional* ectropion:

- Mild medial punctal eversion can be successfully treated with a *medial spindle procedure*
- More severe disease requires a surgery (three words)
Managing **involutional** ectropion:

- Mild medial punctal eversion can be successfully treated with a *medial spindle procedure*
- More severe disease requires a *lateral tarsal strip*
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- Chronic ectropion often produces *bad sequelae*.

(cont)
Managing *involutional* ectropion:

- Mild medial punctal eversion can be successfully treated with a *medial spindle procedure*.
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- Chronic ectropion often produces *anterior lamellar contraction*, which may require a *full-thickness skin graft (FTSG)* to release contracture-induced skin tension.