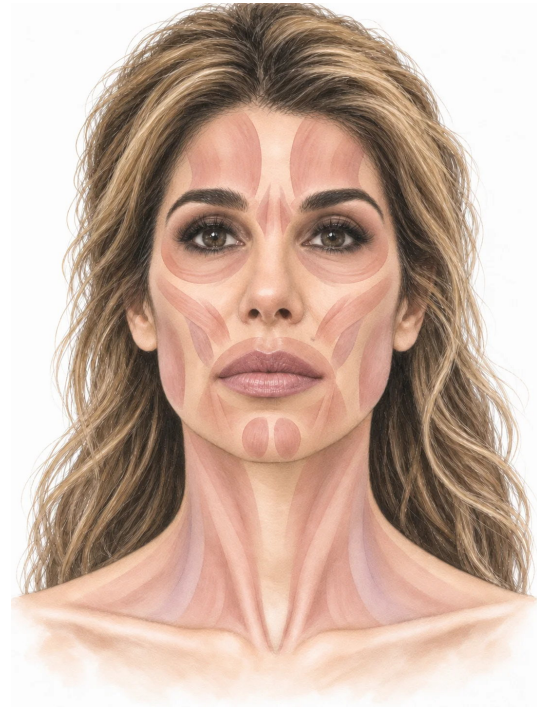


Neuromodulators

The science beneath your expression.

By Melanie Petro, MD · Facial Plastic Surgeon



A nerve sends a signal. A muscle pulls. A face moves.

You smile. You squint. You raise a brow. The muscles beneath your skin make those movements happen. Neuromodulators temporarily soften selected muscle activity, which can soften the lines that appear when you move.

Patient education · Edition 2026-09-28

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Inside the guide

A clear path through the conversation.

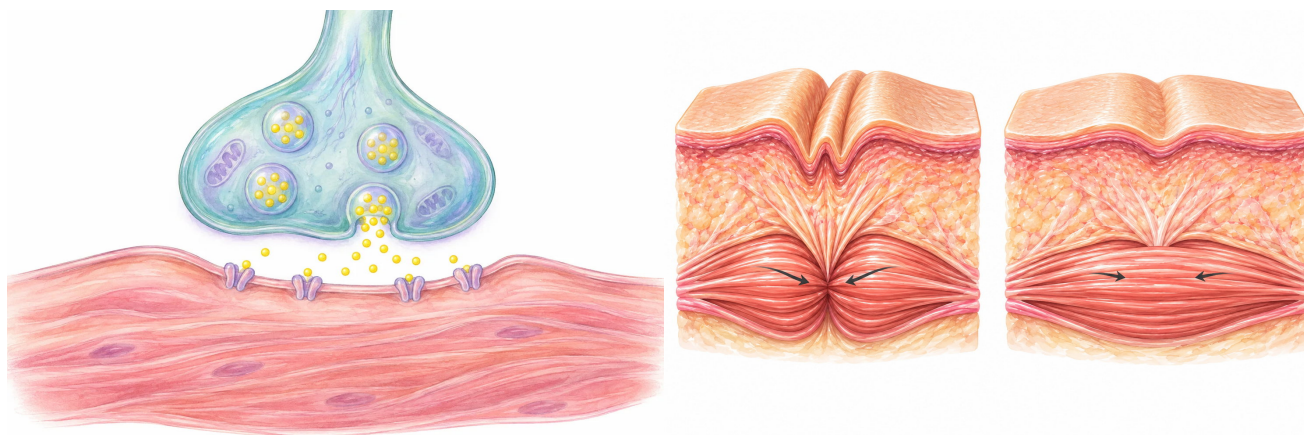
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01 / The signal From a nerve to the skin

It begins with a message.

Raise your eyebrows. See how your forehead folds? That is the muscle underneath pulling on your skin. It starts with a tiny message from a nerve. The messenger is called **acetylcholine** - or ACh. Its job is simple: tell the muscle to move.



01 / The nerve ending A tiny message starts the movement.
Nerve ending above · Muscle below · Yellow dots: ACh messenger

Usual pull Reduced pull 02 / The skin responds Less pull can mean less folding. A line may soften without disappearing. Skin above · Muscle below. Conceptual tissue studies, not treatment results.

Move through the message

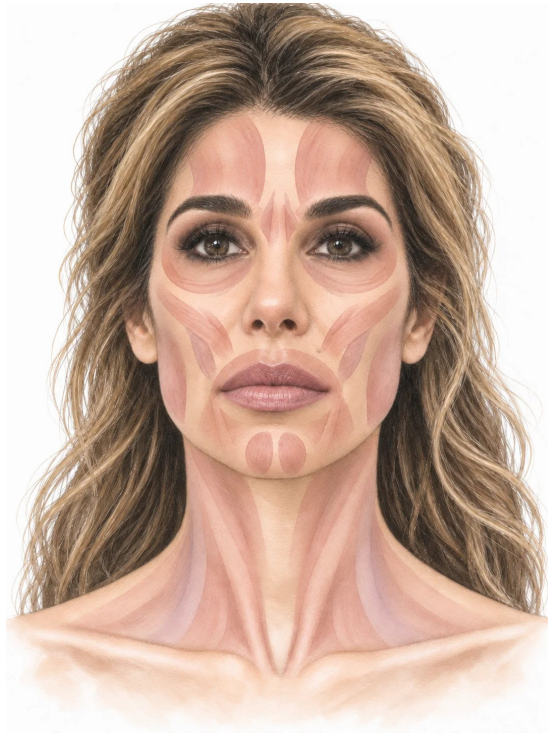
A little deeper

Think of treatment as turning down the message. Botulinum toxin type A acts inside the nerve ending, on a protein called SNAP-25 that helps release ACh. Less ACh reaches the muscle, so the muscle gets less stimulation. The effect is temporary.

02 / The muscles An illustrated anatomy study

The face beneath the face.

Think of the face you make in bright sunlight. Or when you concentrate. Or when you smile at someone you love. Muscles make each movement possible. Tap a name to see its **job**.



Follow the arrows to see the movement.

Choose a muscle to see its job

Never underestimate the power of tiny tox.

Small muscles. **Different jobs.**

01 / The drawstring

More pink, or less lift?

Think of orbicularis oris - the muscle around your mouth - as a drawstring purse. It helps close and pucker the lips. A lip flip can soften part of that pull so a little more **pink** shows, without adding filler volume.

A gummy smile is a different question: how high does the upper lip rise? Selected lip-lifting muscles may be softened when excess lift is the cause. Teeth, gums and jaw structure matter, too.

02 / The balance

Upward. Downward.

The zygomaticus major helps lift a smile up and out. The depressor anguli oris, or DAO, pulls a mouth corner down. When downward pull is the concern, easing it may let the upward pull show more.

A corner can look less downturned without your mood changing. I look at the balance, not just one muscle in isolation.

03 / The little scrunch

The nose moves, too.

Bunny lines appear when you scrunch. Alar flare is the outward movement of the nostril edges. These are different movements, involving small neighboring muscles.

For some faces, softening that movement changes how the nose looks in expression. It does not shrink the bone or cartilage.

These cosmetic uses are off-label. Small adjustments can still cause unwanted weakness or asymmetry, including changes in sipping, speaking or other mouth movements.

Muscle guide

Frontalis · Lifts the brows

The brow lifter.

This forehead muscle raises the eyebrows. As the skin moves upward, horizontal forehead folds can appear.

Brow position matters along with the lines. Some people use their forehead to help support their brows.

Corrugator · Gathers the inner brows

A small muscle. An inward pull.

The corrugator supercilii draws the inner brows toward one another and downward. It works with neighboring muscles during a frown.

The familiar vertical “11s” are skin folds. The muscle pattern underneath varies.

Procerus · Lowers the inner-brow region

Across the bridge.

This small muscle over the root of the nose pulls the inner-brow region downward and can create horizontal folds at the upper bridge.

It overlaps and works with the nearby brow muscles.

Orbicularis oculi · Closes the eyes

More than crow’s feet.

This muscle surrounds the eye and helps close the eyelids. Its outer activity gathers skin during smiling and squinting.

Eye closure is an important function. A line is only one part of the muscle’s job.

Mentalis · Lifts the chin tissue**The chin in motion.**

These paired central chin muscles lift the soft tissue of the chin and help support the lower lip. Contraction can make the skin look pebbled or dimpled.

The chin and the lower lip need to be considered together.

DAO · Draws mouth corners down**One pull down. Another pull up.**

The depressor anguli oris pulls a mouth corner down. The zygomaticus major helps lift it up and outward. Dr. Petro looks at how these pulls work together while you talk and smile.

Softening a downward pull may let the upward movement show more. It does not change your mood or strengthen the lifting muscle.

Platysma · Moves the neck and lower face**A thin, broad sheet.**

The platysma is a superficial muscle that continues from the neck into the lower face. Its activity can make vertical neck bands more visible.

A vertical band and a horizontal neck crease are different observations.

Masseter · Closes the jaw for chewing**This one helps you chew.**

This powerful muscle lies over the back of the jaw and becomes firm when you clench. It is a muscle of chewing, rather than a muscle of facial expression.

Jaw width can come from bone, fat, muscle or a combination.

Orbicularis oris · Closes and puckers the lips**Think of a drawstring purse.**

Dr. Petro compares the muscle around your mouth to a purse's drawstring. It helps close and pucker your lips. Relaxing a small part near the upper lip can let a little more pink show.

The fibers overlap and work with neighboring muscles. The drawstring is an analogy; this muscle also helps you speak, sip and eat.

Zygomaticus major · Lifts the mouth corners**The upward side of your smile.**

This muscle helps draw the corner of your mouth up and outward. Its pull works alongside the DAO's downward pull and other smile muscles.

Dr. Petro watches the whole smile. A downturned corner can involve muscle pull, tissue position or both.

Upper-lip elevators · Raise the upper lip**How far does your lip lift?**

Several muscles beside the nose and above the mouth lift your upper lip. A strong upward movement can reveal more gum when you smile. Dr. Petro watches that lift alongside the rest of your smile.

Gum display also depends on teeth, gums and jaw structure. Showing some gum is normal and does not automatically need treatment.

Nasal & alar muscles · Move the nose and nostrils**A scrunch and a flare.**

Small muscles around the nose help move its sides and nostrils. Scrunching can gather skin near the bridge; flaring moves the nostril edges outward. Several neighboring muscles can contribute.

Dr. Petro distinguishes the movement you notice from the shape of your nasal bone and cartilage.

03 / Expressions The face in motion

Expression is movement.

A smile lifts your cheeks. A squint gathers the skin beside your eyes. A raised brow moves your forehead. Choose a drawing and notice what changes.



Illustrated expression studies. Movement is shown conceptually, not as treatment results.

Expression studies

At rest

A resting face gives a starting point. Natural asymmetry, brow position and lines visible without movement all matter.

Brows lift

The frontalis lifts the brows, moving the forehead skin upward. Horizontal folds may appear as it does.

Brows gather

The inner brows draw closer and lower. Several muscles contribute; the folds alone do not describe the whole pattern.

Smile & squint

The cheeks lift and the skin around the outer eyes gathers. A smile is a coordinated movement, not an isolated wrinkle.

Lips purse

The orbicularis oris gathers the lips like a drawstring. These small movements help you speak, sip, eat and express yourself. Dr. Petro considers those jobs along with the look of your lips.

One brow lifts

One side can move differently from the other. The visible movement is real; its meaning depends on the person and the context.

04 / Microexpressions A movement, briefly seen

Here. Then gone.

Have you ever caught a flicker of movement across someone's face? A microexpression is a facial expression that lasts only a fraction of a second. "Micro" is about how briefly it appears, not the size of a wrinkle.

A quick brow lift can catch your eye, but it cannot tell you exactly what someone feels - or whether they are telling the truth. The moment around it matters. So does asking the person.

Notice the movement.

Leave room for meaning.

05 / Treatment areas Location is only the beginning

Where might it be used?

Start with what you notice: the lines when you squint, the crease when you frown, the chin that dimples. Explore the **movement** behind each concern. I look at your face in motion, then we talk about what you want to change - and what you love as it is.



Shaded regions identify the area being discussed. They are not injection points or a personal treatment plan.

Approval depends on the medicine and the area. Some uses are off-label. Dr. Petro will explain the product, the purpose and what is off-label.

What does “off-label” mean?

A medicine can be approved while a particular use is not. Many of the smaller face treatments here are off-label: FDA has not established safety and effectiveness for that specific use. I will explain why I am considering it, the alternatives and the risks for your face.

The mixture matters

Amount. Concentration. Volume.

They are connected, but they are not the same thing. Adding saline changes the concentration. The dose is the medicine delivered, measured in units for that product. The amount of liquid can affect how the local effect spreads. I consider these together with your anatomy and the movement we want to preserve.

More liquid does not automatically mean less medicine. Units cannot be converted from one neuromodulator to another by a universal formula.

Upper face

Forehead lines

When your brows go up.

Raise your eyebrows and notice the horizontal folds. The forehead muscle creates that lift. Softening its activity can change both the lines and the brow position.

Some people use their forehead to help hold their brows up. That support needs to be considered.

Frown lines

That crease between the brows.

Concentrate, frown or face a bright light. Your inner brows may gather and draw downward. Neuromodulator treatment can soften selected movement in this area.

Dr. Petro watches how you move while you talk. A photograph of the crease tells only part of the story.

Crow's feet

The crinkle beside your eyes.

Smile or squint and the skin beside your eyes gathers. Treatment can soften some of that activity. The same muscle also helps close your eyelids.

The goal should consider comfortable eye closure as well as how the lines look.

Nose-scrunch lines

When you scrunch your nose.

These little creases beside the bridge are often called bunny lines. Dr. Petro watches your nose, cheeks and upper lip move together. Softening a selected pull may soften the scrunch.

An off-label cosmetic use. This changes movement; it does not shrink nasal bone or cartilage. Bunny lines and nostril flare are different concerns.

Nostril flare

When the sides of your nose widen.

The ala is the rounded edge of a nostril. When you smile or flare your nose, those edges may move outward. Dr. Petro can assess whether softening selected muscle activity may reduce that movement.

An off-label use with limited evidence. It may reduce flare during expression; it does not promise a narrower nose at rest.

Lower face & neck

Lip flip

A little more pink.

Think of the muscle around your lips like a drawstring purse. A lip flip relaxes a small part near the upper lip's border so a little more pink may show. Dr. Petro considers how your lip sits and moves; this does not add filler volume.

An off-label use. Even a small change can affect sipping, speech or lip control. Talk with Dr. Petro about what you want to keep as well as change.

Gummy smile

More pink, or less lift?

A lip flip aims to show a little more pink lip. For a gummy smile, the goal may be to reduce a strong upward pull so the lip rises less. Dr. Petro watches your full smile and considers your teeth, gums and jaw before deciding whether muscle treatment makes sense.

An off-label use. Some gum showing is normal. Treatment can also change smile symmetry or lip movement.

Dimpled chin

The chin that puckers.

Pout or press your lips together. The muscle in your chin may make the skin look pebbled. Softening selected activity may reduce movement-related dimpling.

An off-label use. Your lower lip depends on nearby muscle support too.

Mouth corners

Finding the balance in your smile.

The DAO pulls down; the zygomaticus major helps pull the mouth corner up and outward. If downward pull is a big part of what you notice, Dr. Petro may soften it so the upward movement shows more. Your corners may look less downturned without your mood changing.

An off-label use. Nearby muscles also move your lower lip. Unwanted weakness or asymmetry can affect your smile and normal mouth movements.

Masseter prominence

The muscle you feel when you clench.

Place your fingers near the back of your jaw and gently clench. The muscle that firms up helps you chew. Treatment may reduce its prominence when enlarged muscle is the cause.

An off-label cosmetic use. Jaw width can also come from bone or fat. Chewing weakness and jaw fatigue are possible.

Platysma bands

The vertical bands in your neck.

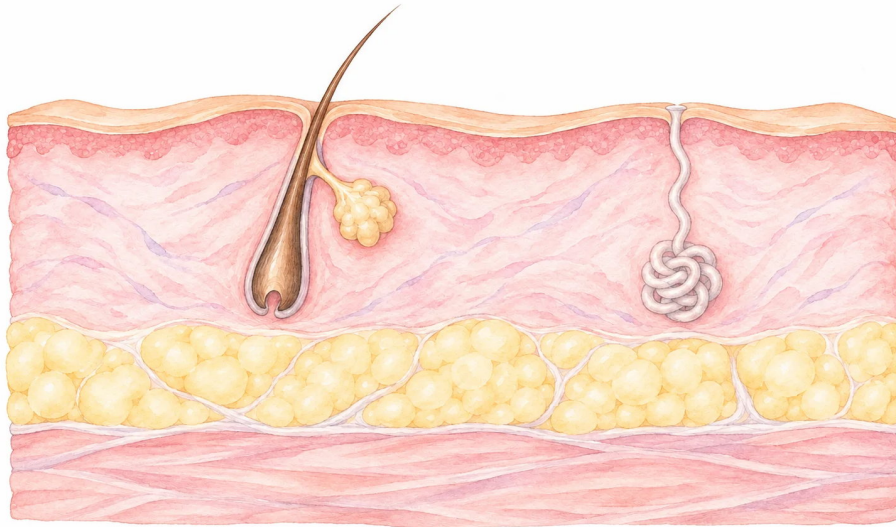
A thin, broad muscle connects the neck with the lower face. When it tightens, vertical bands may become more visible. Treatment can soften selected muscle activity.

Approval depends on the exact product. Vertical muscle bands are different from horizontal neck creases or loose skin.

06 / Microtox Skin quality, with Dr. Petro

Let's talk about that glow.

I think the potential of Microtox is underappreciated. Sometimes the conversation is about the skin itself: the look of pores, oiliness, texture or redness. That fresh, light-reflecting finish people call Korean “glass skin.” I love that look. The approach depends on **your skin**.



Skin quality and muscle movement are different treatment goals. Simplified tissue layers, not to scale; this is not a delivery or injection guide.

The skin

Microtox / Microbotox

In my practice, this conversation includes tiny, superficial injections and microinfusion approaches such as AquaGold. I have also used a “topper” after SkinPen - what I think of as **frosting** over freshly made microchannels - as an adjunct to a skin treatment.

These are different delivery methods. A product placed on the surface does not behave the same way as one injected into skin.

The movement

Tiny Tox / “Baby Botox”

Here, I am using small adjustments to soften selected muscle movement. It is still a neuromodulator, with the same need to respect anatomy. Small does not automatically mean subtle - or risk-free. The goal is a result that fits your face.

A personal combination

What is in the “cocktail”?

Depending on your skin, I may discuss hyaluronic acid, vitamin C or PDRN alongside a neuromodulator. PDRN is often talked about online as “salmon sperm”; that nickname does not identify the actual product, formulation or route.

Each ingredient and combination needs its own review. They are not interchangeable, and there is no one mixture for every face.

The skin conversation

Pores. Redness. Texture.

Acne, redness and rosacea come up in these conversations, too. Small studies suggest some skin-quality benefits, but the evidence varies by concern and delivery method. Acne scars, active acne and rosacea are different problems.

We will talk about what is established for your concern and where Microtox is still emerging. “Glass skin” describes a look, not a guaranteed outcome.

How long?

Think temporary.

I often describe the aim as roughly a three-month window. That is an estimate, not a promise. Skin-directed treatment, different ingredients and different delivery methods do not all have the same duration as muscle treatment.

We reassess your skin and how it responds, rather than assuming the same calendar fits everyone.

What I want you to know

These skin uses of neuromodulators are off-label. SkinPen’s FDA clearance does not cover delivering Botox, PDRN, vitamins or other products into the skin. An unapproved product is different from an approved medicine used off-label; we need to identify the exact products and their status. Evidence for these combinations is limited. Product suitability, infection, irritation and unwanted muscle weakness all belong in our discussion.

A little Petro perspective

*That “I’ve been drinking liters of water” look.
Even on a **loaded-tea** kind of day.*

A look I love - not a substitute for hydration.

07 / Your pattern A moving face deserves a moving assessment

There is no universal pattern.

No two foreheads are the same. To me, the forehead is one of the most misunderstood parts of the face. I love watching people talk. That is when I see the little lifts, the asymmetry, the quirky movements that **decorate** someone's face. Some of those movements are exactly what I want to preserve.



Two treatment moments, painted from photographs shared by Dr. Petro.

Look again. Every time.

I love the variety in this work. The last thing I want is to get into a rut and repeat a pattern simply because we used it before. Sometimes the plan stays the same. But I want to look at you again, watch you talk again, and decide with you.

It is not all or none. Small movements help make you recognizable. Anatomy, the amount used and how the medicine reaches the intended muscle all matter. Depth matters because the forehead has layers, and the medicine needs to reach the nerve endings that signal the intended muscle. A smooth forehead is only one part of a moving face.

Try watching a conversation

Does the movement support the **story**?

When I watch the news, I notice when facial movement draws my attention away from what they are saying. We cannot know from a screen what treatment someone has had. But we can notice the balance between expression and distraction. That is a useful way to understand what I am looking for in a consultation.

The question Dr. Petro asks with you

What would we soften?

*What makes you **you**?*

Some things just need to be. We do not have to erase every movement.

Movement patterns

A broad lift

Dr. Petro starts by watching you talk.

No two foreheads move exactly alike. Dr. Petro watches how your brows lift across the forehead while you talk, then looks at where they rest. That combination helps shape your plan.

She reassesses your movement at each visit. The plan can change as your face and preferences change.

More central lift

Small adjustments can matter.

You may lift more through the center while the outer brow moves less. Dr. Petro considers those differences so selected movement can soften while other movement remains.

Treatment is not an all-or-none choice. These arrows show an idea of movement, not a formula for your forehead.

Two sides, different lift

Keep the movements that make you, you.

That one-brow lift may be one of the quirky movements that decorate your face. Dr. Petro wants to know which expressions feel like you and which changes bother you before deciding what to soften.

The two sides do not have to become mirror images. Bring your preferences into the conversation.

A brow that needs support

The forehead may be helping you.

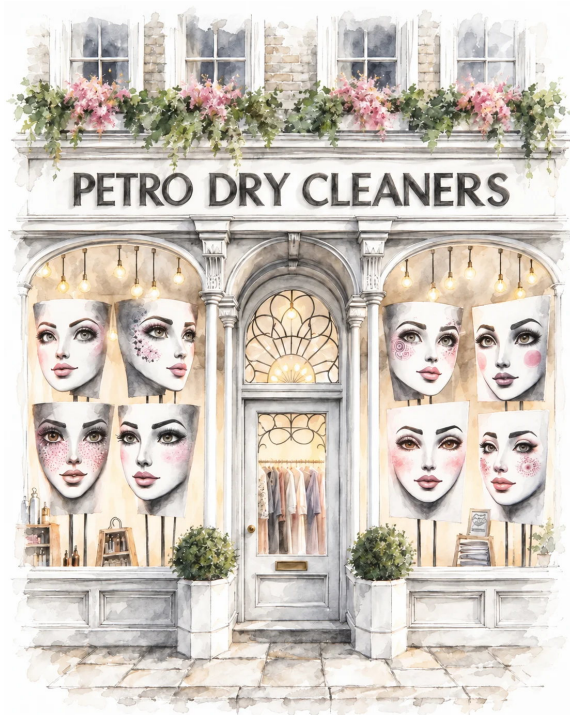
You may use your forehead to help hold your brows up. Dr. Petro looks at your eyelids, resting brows and movement together before softening that support.

Tell Dr. Petro how your last treatment felt when you talked, smiled and raised your brows. Each visit is a chance to reassess.

08 / Sweating Another kind of nerve message

The “Petro Dry Cleaners” story.

My white shirts kept turning yellow. The dry cleaners told me it was sweat - but I never felt like I was sweating. I joked that I was going to open Petro Dry Cleaners. It turns out you do not have to feel drenched for sweat to be part of the story.



The Petro Dry Cleaners idea, reimagined in watercolor.

Same messenger. Different destination.

Turn down the **sweat signal**.

Acetylcholine does more than tell muscles to move. It also tells certain sweat glands to release sweat. Neuromodulators can temporarily reduce that signal in a treated area.

Underarms / axillae

For severe underarm sweating that topical treatments have not managed, Botox® has an approved use in adults. That approval belongs to that product and situation; it does not extend to every neuromodulator.

Scalp / head sweat

I have also treated people bothered by a lot of scalp sweating. This is off-label, with less research behind it. We first talk about where you sweat, how it affects your day and what may be causing it.

Sweating helps cool your body. More sweat does not mean more fat burned, and reducing excess sweating is not a weight-loss treatment.

Your conversation with Dr. Petro Melanie Petro, MD • Facial Plastic Surgeon

Your face. Our conversation.

Tell me what you notice and what you want to keep. We will talk about the product, the movement we might change, and when I want to see you again. I want to understand your face beyond one photograph of a smooth forehead.

Melanie Petro, MD • Facial Plastic Surgeon

From Dr. Petro's notebook

“Watching people talk is essential to mapping their face.”

This masterclass grows from my explanations, personal stories and the way I look at movement. The drawstring purse. The upward and downward pull of a smile. The white shirts. The expressions that make you look like yourself.

The drawings were created for this Petro masterclass, using an artistic likeness of me. Muscle shapes and layers are simplified so we can talk about their jobs. Every real face has its own anatomy.

Educational illustrations, not photographs of treatment results. Botox®, Dysport®, Xeomin® and Jeuveau® are registered trademarks of their respective owners.

Keep exploring.

- [Forehead questions >](#)
- [Lines between the brows >](#)
- [Jaime's Botox story >](#)
- [Read the filler guide >](#)
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