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Solving Vision Complaints

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Alex Yoho, ABOM
Alex Yoho has no financial interests to disclose.

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How Eyewear Causes Vision Problems

Patient perspectives

• Visual habit – fighting the brain
• Some people have a hard time with change
• Seeing 20/20 may not be the patient’s goal (though they think it is)
• They tend to want normalcy and a new Rx can change all that
• Patients don’t understand there are limits to what eyewear can do

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How Eyewear Causes Vision Problems

Our Perspective

• We strive for perfection
• Best acuity is our goal and we know the patient’s brain can and will usually adapt
  — “you’ll have to wear them for 2 weeks”
• We tend to keep all things the same and only change the Rx
• We understand there are limits to what eyewear can do
How Eyewear Causes Vision Problems

- Frame adjustment controls lens position
- Adjust for lens position first
  - The purpose of eyewear is good vision
  - Adjust for comfort second
  - The patient assumes good vision
  - The patient concerned with appearance and comfort

Let's do it all!

Solving the problems

- Understand the patient’s lifestyle goals
- Listen carefully to frustrations

General Vision Complaints

- Critically define the complaint
  - Blurry vision
    - Overall, distance, near, elsewhere
  - Double vision
    - Overall, distance, near, elsewhere
  - Perception
    - Often not describable
General Vision Complaints

• First double check that eyewear matches Rx
  – Not just Rx power, but also check for waves and unwanted prisms
  – If good proceed, if not remake
• Compare old eyewear to new
  – Big change maybe the only problem
  – Check all other possibilities before referring back to Refractionist

General Vision Complaints

• Settle the patient
  – If the patient is not cooperative, we can't resolve the situation.
  – We need to ensure the patient is looking through the center
  – Make sure the patient likes the frame
  – And for that matter, those people with the patient
• Check for expected acuity
  – Use an acuity chart at proper distance for eyewear

Double Vision

• Vertical double vision
  – Check for vertical imbalance
• With lined bifocals, patient could be looking through lines
  – Solution – frame bifocals
• Consider slab off
  – When power difference at V00 is 2Δ or more
Double Vision

- Horizontal double vision
- Check for horizontal prism (PD off)
  - Solution: Remake correctly
- When there is a significant power difference at X 180 and patient looks to the side
  - Solution: consider contact lenses

General Vision Complaints

- When the patient can see clearly, but things are "just weird"
  - Usually means that new lenses are changing Perception, or "visual habits"
  - The go-to answer has always been base curve
  - Could be, but often not the problem

Base Curves

- Change in base curve occurs for a reason
  - If base curve is appropriate due to power change, vision can be clear, but still "weird"
  - This is when it is appropriate to require the patient to wear for a few days to allow the brain to adapt
- If base curve change is just because the appropriate one was not on hand, remake in the proper base curve
- Check factory base curve charts to be sure correct base curve for their design was used
Base Curves

- Aspheric and Freeform are exceptions
  - These lenses reduce many of the natural distortions and aberrations inherent in regular lenses
  - Optimum clarity of vision can actually be disconcerting!
- Essential to check position of wear for the design

Lens Position

The visual axis passes straight through the eye to the macula

Lens position

- Correct pantoscopic tilt aligns the lens surface perpendicular to the visual axis
Lens Position

• To avoid oblique astigmatism the correct amount of pantoscopic tilt is required.
• Generally, there should be equal space from the brow and the cheeks to the lens.
• Since the visual gaze at rest is slightly downward, pantoscopic tilt allows the lens to be perpendicular to the visual axis in the normal gaze, reducing oblique astigmatism and prism.

Demonstration

Notice the image squats from induced astigmatism and shifts up from induced prism as pantoscopic tilt is introduced.
Pantoscopic Angle
• Matching old angle *may* help, but also may not give best vision.
• Correct Pantoscopic angle is approximately 2° for every millimeter optical center is below pupil center at straight forward gaze.
• Incorrect angle causes prism and unwanted oblique astigmatism

Face Form
• Face form tilts the lens too, causing the same problems of oblique astigmatism and prism it's just in a different plane.

Face Form
• Incorrect face form makes the lens surface at an angle to the visual axis
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Face Form
- The correct face form makes the lens surface perpendicular to the visual axis.

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Wrap – or face form
- Incorrect amounts create oblique astigmatism
- Normal amount required for optimal optics
- A rotation of the lens about the 90° axis changes the effective power of the lens
- Too much or too little effectively creates cylinder
- Too much or too little effectively creates prism

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Wrap – or face form
- Should be adjusted for patient first
- Ideally the lens surface should be perpendicular at the PD, or, 2 degrees of face form for every millimeter of decentration
- Changes from the normal will need compensation
Measuring Wrap – or face form

- Manual Methods
  - Use a protractor to measure the relationship between a line across the backs of each endpiece and the plane of the lenses
  - Use a wrap angle measuring chart
  - Use a panorameter

Face Form

- Matching old angle may help, but also may not give best vision
- Correct face form places the surface of the lenses perpendicular to the visual axis at straight forward distant gaze (PD)
- Corrects marginal (oblique) astigmatism
- Incorrect angle causes prism and unwanted astigmatism
- 2 degrees of face form for each millimeter of Decentration.

Vertex Distance

- This can change the effective power of the correct power lens
- Doesn’t have to match the old glasses, but does need to be at the distance the prescriber intended, or compensated for the new distance
- Changes the patient’s perception – think “feel” of the surrounding world
- Can affect the size the patient perceives
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**Vertex Distance**

- Distance from the cornea to the spectacle lens
- Changes the *effective* power of the lens
- This occurs because the point of focus moves as the lens moves.

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**At the proper Vertex distance,**

- light rays are in focus

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**At the proper Vertex distance,**

- light rays are in focus
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As Vertex distance is increased, the focus follows the lens away from the retina.

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Vertex Distance

- As a lens is moved away from the eye:
  - Plus lenses require more minus in the lens
  - Minus lenses require more minus in the lens
- As a lens is moved closer to the eye:
  - Plus lenses require more plus in the lens
  - Minus lenses require more plus in the lens

The focus on the retina moves with the lens, so add plus to shorten the focus, add minus to stretch the focus.

Compensated Power = Original Power / (1 + Distance Moved * Original Power)

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Slanting Surfaces

- Prism can cause slanting (high side on the base side of the prism)
- Solution: Split prism between eyes
Slanting Surfaces

- Prism can cause Patient to feel short; Floor seems like walking in a bowl; or floor slants up looking away (Base Down Prism).
- Solution: Adjust optical centers down (minus lenses) or up (plus lenses).

Slanting Surfaces

- Prism can cause Patient to feel tall; Floor seems like walking on a hill; or floor slants down looking away (Base Up).
- Solution: Adjust optical centers up (minus lenses) or down (plus lenses).
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**Slanting Surfaces**

- Vertical prism all on one eye can cause slanting (high side on the base side of the prism)
- Solution – split prism between eyes

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**Balance Complaints**

- Leveling the frame
  - First determine if additional pantoscopic or retroscopic tilt is needed
  - Use this information to determine which side you will adjust to yield level AND proper pantoscopic tilt

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**Balance Complaints**

- To raise the right lens
  - Add pantoscopic tilt on right side (temple down)
  - Add retroscopic tilt on left side (temple up)
- To lower the right lens
  - Add retroscopic tilt on right side (temple up)
  - Add pantoscopic tilt on left side (temple down)
Balance Complaints

- To raise the left lens
  - Add pantoscopic tilt on left side (temple down)
  - Add retroscopic tilt on right side (temple up)
- To lower the left lens
  - Add retroscopic tilt on left side (temple up)
  - Add pantoscopic tilt on right side (temple down)

Bifocal Heights

Trifocal heights
Progressive Addition Heights

Multifocal position
- Traditional proper position
  - Progressives – Pupil center
  - Trifocals – lower edge of pupil
  - Bifocals – Lower edge of limbus

Multifocal position
- Consider visual habits
  - More often too low than high
- Consider visual tasks
  - Where does the patient do their tasks?
- What about the effect of the distance Rx?