On behalf of Vision Expo, we sincerely thank you for being with us this year.

Vision Expo Has Gone Green!

We have eliminated all paper session evaluation forms. Please be sure to complete your electronic session evaluations online when you login to request your CE Letter for each course you attended! Your feedback is important to us as our Education Planning Committee considers content and speakers for future meetings to provide you with the best education possible.

vision expo

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Jesse Walters, ABOM

- **No Financial interests to disclose**
- **Account Representative and Optical Trainer for an independent OD owned national lab: Summit Optical**
- **CE Author, content editor and advisor for the Optical Training Institute**
- **CE contributor for Quantum Optical**
- **All relevant relationships have been mitigated**

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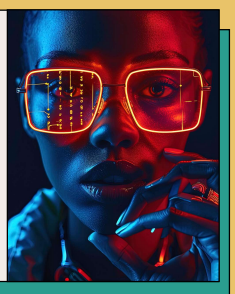
Common Sense Compensation 101

Jesse Walters, ABOM
1 hour ABO Technical Level III



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Learning Objectives:

Why does the prescription need to be changed?
How do the position of wear measurements change the final prescription?
When is it most important to utilize?
What potential problems can occur?

Define & Justify Lens Compensation

Prescribed Rx vs Effective Power

Vertex: Power Changes and Measuring

Wrap & Tilt: Changes in Power & Prism

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Compensation Defined:

A compensated prescription is any intentional change in lens power or measurements from the doctor's original Rx with the objective to more accurately correct vision through a pair of glasses.

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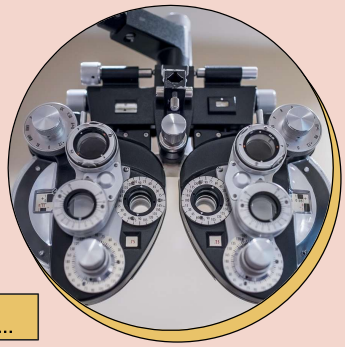
The Doctor's Refraction vs Real World Wear

An optometrist's refraction utilizes a small round lens sitting perpendicular to the eye at a fixed distance having the patient looking directly in front of them at a well-lit chart mounted at 20 feet.



The prescription is written from these carefully controlled conditions and then…

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To Deliver the Promised Prescribed Rx:

…Every patient is fit into small, round, flat frames that are adjusted to sit at the exact distance of the phoropter.

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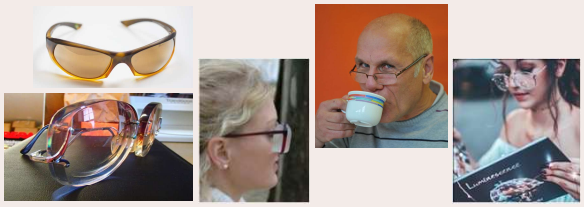
Medical Device vs Fashion Accessory

The prescription is filled in lenses of all different sizes, shapes and curves…



… mounted into frames that fit closer or farther from the eye with any extreme of tilt, face-form or wrap.

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> The **Effective Power** is the actual correction viewed by a patient as a result of how a lens is positioned in front of the eye.

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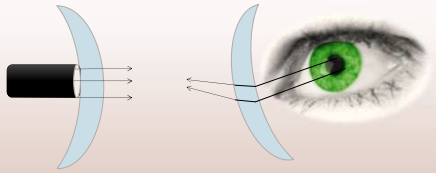
When the compensated lens is then mounted perpendicular at a fixed distance in a lensometer it will read differently…



The patient is viewing the prescribed Rx as a result of how the lens is positioned in front of the eye.

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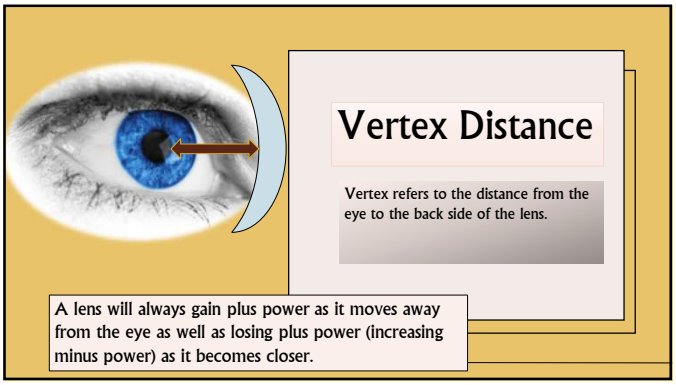

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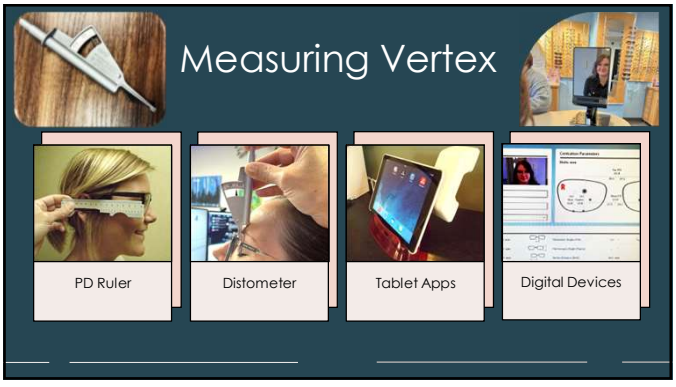

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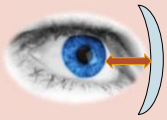
Vertex & Effective Power



- Plus Lens ⟹ Increased Vertex
  Effective Power More Plus
- Plus Lens ⟹ Decreased Vertex
  Effective Power Less Plus
- Minus Lens ⟹ Increased Vertex
  Effective Power Less Minus
- Minus Lens ⟹ Decreased Vertex
  Effective Power More Minus
- High Powers ⟹ Larger Effective Change
  Greater Effective Change as Dioptric Power Increase

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Pantoscopic Tilt

- Lens tilt on the horizontal axis
- Panto = angled towards the cheek
- Retroscopic tilt = angled away from the cheek
- Induces unwanted cylinder @ 180 axis
- Moves OC height alignment up

Pantoscopic adjustments should be made in all lenses to improve ground view & reading zones

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Measuring Panto

Proper Adjustment

- Always pre-adjust the frame
- Retroscopic tilt should be adjusted to positive panto
- Panto must be measured as worn on the patient

Measuring devices

- All devices measure tilt in relation to the ground, not the eye
- Getting a patient's head and posture accurate is imperative

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Frame Wrap

- Measured in Degrees of Tilt on the Vertical Axis
- Induces Unwanted Horizontal Prism
- Frame Wrap Panoramic Angle Face-Form Z-Tilt
- Induces Unwanted Cylinder @ 090-Degree Axis

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Measuring Wrap

Wrap Angle in Degrees
- Measured with protractor, wrap layouts, or manual devices
- Digital measuring devices measure wrap value, some need dark lenses removed
- Wrap angle can be measured without the patient wearing the frame

Ophthalmic Wrap vs. Sport Wrap
- 0-11˚standard range-important for higher powers and corrects unwanted cyl
- 12-30˚ high wrap- important for all Rxs and corrects for cyl and prism error

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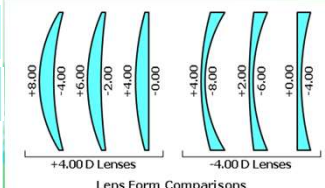
- The front curve is known as the base curve and is measured in diopters
- The sum of the front (+) and back (-) curves make the prescription
- Plus lenses have higher base curves and flatter back curves
- Minus lenses have flatter base curves and higher back curves
- The Rx and lens design will determine the best base curve

Base Curves



Lens Form Comparisons

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Base Curves

Ideal Base Curves

- Every prescription has an ideal base curve to reduce peripheral aberrations
- Digital lenses employ base curve optimization for ideal optics
- Most digital lens designs don't allow base curve specifications

Wrapped Frames

- Frame wrap ≠ base curve
- Base curve is measured in diopters with a lens clock
- Due to special bevels and sunglass lenses, flush front bevels are needed
- Base curve of the Rx must match demo within one diopter

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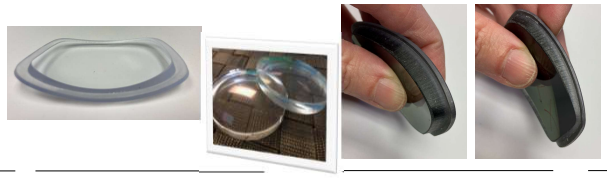
Prescription Limitation for Wrap Frames

- **Minus** lenses are limited by resultant back curve and blank thickness
- Optimally, back curves should stay within 10 diopters for best optics, with up to 15-17 diopters possible
- **Plus** lenses increase thickness with eye-size and decentration
- Lab can calculate and call with thickness before surfacing



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Digital Surfacing

FREEFORM GENERATION

Lens designs are calculated and created by software that instructs a single-point diamond lathe in the generator to create the prescription

CUSTOMIZED

Each lens is designed per-order and can utilize limitless personalized measurements and complex algorithms

PRECISION

Allows for 10,000 points of instruction for complex curves on the back surface and is capable of 1/100th of a diopter accuracy

DESIGN INNOVATIONS

- IMPROVING OPTICS
- CUSTOM MEASUREMENTS
- PERSONALIZED DESIGN

There are many ways digital technology can be used and many more we have not discovered yet...

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Custom vs. Default Position of Wear Measurements

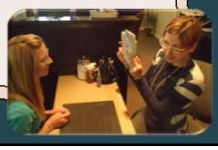
Digital lenses are often compensated whether or not measurements are provided

Custom values

- Measured vertex, panto, and wrap of pre-adjusted frame
- Manual and digital devices are available
- Personalized for each individual
- Adds value to the patient experience
- Highly valuable for higher prescriptions or frames fit outside normal parameters (i.e. high wrap styles)

Default Values

- Uses average adjustment values of ophthalmic frames
- Improves patient's visual experience based on the common differences between refracted and as-worn lens power
- No need for understanding of measurement devices or extra time in lens ordering



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Summary

- ❑ As the lens changes angle & distance in front of the eye, the effective power the patient experiences also changes
- ❑ Prescription compensations create a lens where the effective power translates as the original prescribed Rx
- ❑ Opticians can pre-adjust frames and take position-of-wear measurements of vertex, wrap, and pantoscopic tilt to calculate personalized compensations

Stay tuned for the next class for the underlying mathematics, interpretation, and troubleshooting…

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Common Sense Compensation 101 …up next 201

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