Opticianry Study Center CE 20/20

1 CE Credit

Getting Adjusted

By Andrew Bruce, ABOM

It is the age of state-of-the-art technology: free-form lens designs, ultra-thin materials, high-quality anti-reflective coatings and light weight frames, to name but a few. Opticians are in a position to make patients the finest pair of glasses they have ever had by using all the resources at their disposal.

However, without precisely fitting and adjusting the finished product to the patient, with the very same attention to detail given to the choice of material, design and treatment, it may compromise both your and your patient's expectation. In fact, without quality dispensing techniques, the eyewear may as well be a pair of 62-eye aviator, photogray glass, executive trifocals. No offence to those out there who like these. The point is fashionable, high-quality eyewear deserves professional, high-quality dispensing. New products and sophisticated technology purchases today require precision and comfort to go along with great vision and looks.

The patient's long-term satisfaction with their new eyewear depends on how comfortable the eyewear is and how well the optician has done their job in the fitting and adjustment process. The following information is intended to provide an overview of the fitting and adjustment process and its importance in the services performed by the optician.

IT STARTS AT FRAME SELECTION

Eyewear adjustments should begin at the time of frame selection. It is important to pre-fit the frame to the patient prior to measuring segment and optical center (O.C.) heights. Attention should especially be made to the degree of pantoscopic tilt and the way the nose pads, if present, sit on the bridge of the nose. These details can dramatically affect the measurements taken.

First, inspect the touch of the nose pads, or the way the bridge of the frame rests on the nose: look for good alignment of adjustable nose pads, or good touch of a zyl saddle or keyhole bridge. For adjustable pads, each pad should be flat on the side of the nose without their edges bunching up the skin. The bridge of a zyl frame should touch a large portion of the side of the nose for good support and comfort. Be sure that the edges or corners of the bridge won't leave red marks or indentations on the nose. This is especially important on the crest of the nose.

Once the frame is in good alignment, take any measurements that are required, place the order with the lab and wait for the lenses, or completed glasses, to be returned.

STANDARD ALIGNMENT

Once the lenses have been fabricated and mounted, the frame should be put in "Standard Alignment" (also called four-point touch) as part of the verification process. Standard alignment

Release Date: January, 2010
Expiration Date: November 16, 2014
Learning Objectives:
Upon completion of this program, the participant should be able to:
1. Have an understanding of professional eyewear dispensing techniques.
2. Raise the standard of care provided by the optician to a new level, setting the optician apart from his/her competition.
3. Have an increased awareness of what patients consider the most important service provided by opticians.

This CE is separated into two parts each eligible for 1 CE credit hour.

Faculty/Editorial Board: Andrew Bruce graduated from Wigan College of Technology in England as a photography major in 1986 and worked as a professional photographer for 13 years. Following a career change, he graduated from the opticianry program administered by the National Academy of Opticianry in 2001. After completing a three-year apprenticeship and successfully passing the Washington State Boards, he became a LDO in 2005. He received his Masters in Ophthalmic Optics in June 2009 and is currently the optical manager for a private optometric practice in Battle Ground, Wash. He holds multiple black belt degrees in Tae Kwon Do, which he also teaches on a part-time basis.

Credit Statement: This course is approved for one (1) hour of CE credit by the American Board of Opticianry (ABO). Course #SJMI196-1

This CE is also available online at www.2020mag.com

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FIGURE 3A

FIGURE 3B

FIGURE 3C

refers to the process of preparing the frame for the patient by making sure it is not distorted from its natural shape.

Check the frame for horizontal and vertical alignment; temples should be at 90 degrees to the frame front when extending backwards (Figure 3A) and the frame front should not be propellered, or skewed in one direction or the other, when viewed from above and sideways sometimes referred to as "Xing" (Figure 3B). It should also have a small amount of faceform.

The "Table top test" is a good way to check for standard alignment: Sit the inverted frame on a table top with the temples open and there should be no wobble. (Figure 3C Xing Table Top Test)

DELIVERY

Dispensing is the optician's opportunity to shine. The patient gets to see the eyewear that has been carefully designed for them. Do not take the plastic lab tray out to the patient when dispensing new eyewear—this just kills the presentation.

Let the patient know how special their glasses are by presenting them like a piece of fine jewelry. Make it known that their purchase has been handled with the utmost care—for example, any cloths used to clean the lenses should be clean, not stained and dirty. It is recommended the optician place the glasses on the patient for the first time in case substantial additional adjustment is needed, in which case the eyewear can be removed immediately to avoid a negative first impression for the patient.

To place the glasses on the patient, carefully slide the eyewear on, gently spreading the temples if necessary, guiding the temples over the ears and down behind the ears.

If the patient prefers to wear the glasses at a specific place on their nose (vertex distance), this should have been considered during the initial selection and measurement process. Changing the vertex distance can change the effective power if dealing with high powers, and also affects the segment and O.C. heights. Increasing the vertex distance will make a "plus" lens effectively more

Adding the correct amount of pantoscopic tilt brings the optic axis of the lens in line with the center of rotation of the eye—improving visual comfort for the patient. With zero pantoscopic tilt, the lens optical center and optical axis will pass through the center of rotation of the eye only if the pupil is at the same height. However, the pupil is rarely vertically centered within the lens—it is generally positioned approximately 5mm above the datum line, or frame midline. If zero pantoscopic tilt is applied to the frame, the wearer may experience some visual discomfort from lens aberrations induced by changes in sphere and cylinder powers due to the misalignment. In addition, glasses look better with some degree of tilt, on average 7 to 10 degrees.

It is important to note that for every 2 degrees of pantoscopic tilt added to the frame front, the O.C. of the lens should be lowered 1mm. As mentioned above, most eyes sit about 5mm above the frame midline, so it is important that the amount of pantoscopic tilt needed, usually 5 to 15 degrees, is applied to the frame prior to measurements being taken. The O.C. height ordered must factor in the degree of tilt applied to the frame—if no O.C. height is specified, most labs will place it at, or just above, datum, assuming approximately 7 to 10 degrees of tilt. If the frame is not pre-fit, the relative (Figure 1: Pantoscopic Tilt) placement of the segment, or O.C., will be misaligned with the line of sight of the eye in the finished lens (Figure 2).

FIGURE 1

FIGURE 2

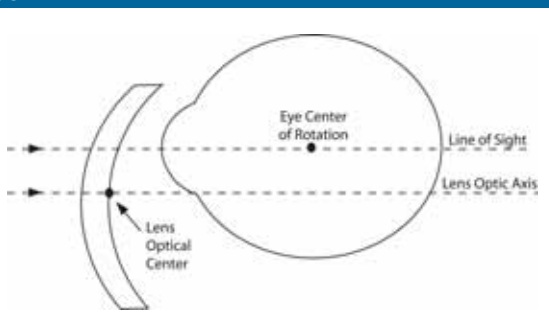


FIGURE 5

FIGURE 4

plus and a "minus" lens effectively less minus. Conversely, decreasing the vertex distance will make a "plus" lens less plus and a "minus" lens more minus. When dealing with high powers, above ±6D the optician must factor in any significant variations from the refracting vertex distance to the worn vertex distance when ordering lenses. If vertex compensation is not applied to the written Rx, the patient will be unhappy with the quality of vision using their new eyewear. With regards to the effect of varying the vertex distance on segment and O.C. height—decreasing the vertex distance generally results in sliding the frame higher up on the nose effectively raising the relative heights. On the other hand, increasing the vertex distance will effectively lower the relative heights, generally moving the frame lower down the nose. This will become increasingly more important as free-form lenses become more widely used—many requiring vertex distance measurements to be provided when the lenses are ordered. A distometer (Figure 4) can be used to quickly and easily measure the vertex distance of the glasses in the "as worn" position.

Although the frame was pre-fit to the patient, the process of glazing and insertion of the lenses can frequently cause some misalignment and create the need for fine-tuning. If present, the nose pad position should be fine tuned so the frontal/spread angle, the splay angle and the vertical angle are all correct for the patient. Slim pad arm adjusting pliers (Figure 5) work well for this. The frontal/spread angle is how far apart the pads are. The splay angle is their angle to the nose, which should complement the angle of the nose at the point at which the nose pad is sitting. The vertical angle is controlled by the size of the loop of the pad arm—the standard position requires the bottom edges of the pads be closer to the eye wires than the top edges of the pads. The objective is to make all three angles sit flush with the skin to achieve superior comfort.

FIGURE 6 Modified from "Clinical Optics" by Fannin & Grosvenor

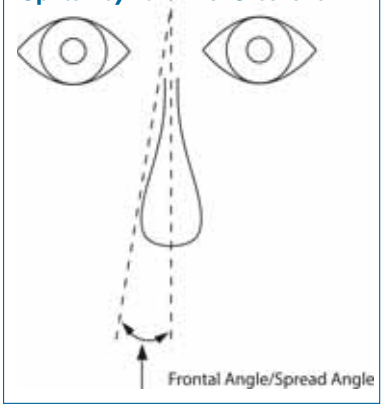


FIGURE 7

There are two schools of thought when dispensing progressives—ink markings or no ink markings. If you are of the ink markers, make sure that the markings are still on the lenses; if not, re-mark the location of the fitting cross. If markings are on the lenses, advise the patient that initially these may obscure their vision and will be removed once alignment has been verified. Let the patient know the fitting marks are there to allow the fine adjustments necessary to customize the fit of their eyewear. Inform them that handling during glazing and insertion of the lenses can occasionally cause misalignment and the need to re-verify alignment.

The no ink marks folks believe if the lenses were measured correctly, there's no need to check, only if troubleshooting is required. In fact, the lenses should be pristine to show off those great AR lenses the patient ordered. Also, suggesting the markings be left on to verify fitting could suggest to the patient that the optician lacks confidence in his or her abilities to measure accurately.

It's your choice.

FIGURE 8

FIGURE 8A

FIGURE 9

Figure 8b. - How to Correct Frame Front Tilt
Viewed from a head on position, the frame front is tilted down on the right side (the patient's left). To correct this, angle the patient's left temple down (increasing the pantoscopic tilt on that side). This effectively raises the patient's left lens to match the right.

Generally, the angles should be such that the pads are angled slightly toward the face to follow the natural contour of the side of the nose (Figure 6). A good test is to raise and lower the frame and closely observe the nose pads from the front as they touch down on the nose. The top and bottom tip of the pads should touch down at the same time. If one tip or the other touches first, that part is going to apply too much pressure on the nose and possibly cause irritation. Also, looking at the nose pads from a "head on" position, the cushion side of the pad should not be visible. In addition, to maintain the correct vertical angle, the loop of the pad arm should be small in order to keep the vertex distance to a minimum (Figure 7).

When fitting patients with very flat bridges, such as those of Asian ethnicity, frames with nose pads are usually the best option. However, fitting nose pads to these patients can be very challenging and takes some practice. The splay angle has to be changed so the pads are sitting almost parallel to the face. Also, the loop of the pad arm may need to be made larger than standard to keep the frame off the patient's lower cheeks by changing the vertical angle (figure 8). Bent Snipe pliers are good tools for this purpose (Figure 8a).

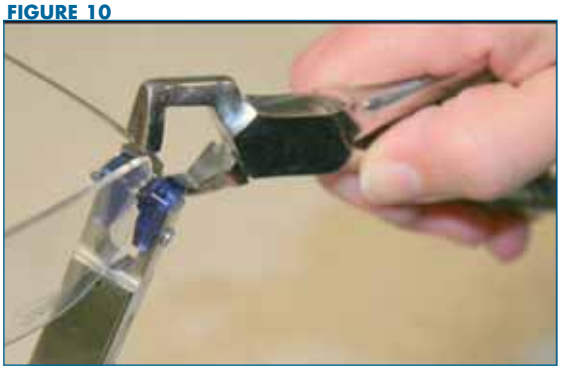
Once the nose pads are sitting well, check the alignment of the frame front. It should be level. If the patient's face is asymmetric, this can be challenging. In order to achieve premium vision, the horizontal optical centers of the lenses should be level with the pupils. However, if the eyes are vertically uneven, the patient is not going to be happy with a crooked frame, regardless of how detailed an explanation of the effects of prism may be presented. In a situation like this, try to achieve a happy compromise. Remember, a patient is basing their first impression of how their new eyewear fits on several things including how level their eyebrows are relative to the top of the frame and how comfortable the frame feels.

If the frame front is tilted, always correct in the direction of the error.

If the right side of the frame front is lower than the left, increase the pantoscopic tilt of the right side (angle temple down), or decrease the pantoscopic tilt of the left (angle temple up) (Figure 9). Use a pair of wide jaw angling pliers for this task. It securely holds the temple and end piece together so as not to put excessive strain on the hinge. (Figure 10).

The above information has provided an overview of many components of the eyewear dispensing process. However, there are many more to come; (part 2 of "Getting Adjusted" with appear in an upcoming issue of *20/20*).

FIGURE 10



Part 2 will cover more on the topic of pantoscopic tilt and its importance on quality of vision; provide instruction on correcting horizontal misalignment of frames; review the "fitting triangle" and the three-point touch; give instruction on how to correctly fit frames behind the ears with consideration of the Mastoid Process; give instruction on temple shortening procedures; and show results of a survey investigating what patients expect from their optician. ■

Self-Assessment Examination

1. Eyewear adjustments should start:
- **a.** Are not necessary until final dispense
- **b.** After progressive markings have been removed
- **c.** At the time of frame selection
- **d.** Dependent on the type of lens being used

2. The most important evaluation of the fit of a zyl frame on the nose is:
- **a.** The crest of the nose
- **b.** The sides of the nose
- **c.** A zyl frame always fits well on the nose
- **d.** A and B

3. Applying the correct pantoscopic tilt will:
- **a.** Make the frame look better on the face
- **b.** Avoid the need to apply AR coatings
- **c.** Bring the optic axis of the lens in line with the center of rotation of the eye
- **d.** A and C

4. How does pantoscopic tilt affect O.C. placement?
- **a.** For every 1 degree of pantoscopic tilt, the O.C. of the lens should be lowered 2mm
- **b.** For every 2 degrees of pantoscopic tilt, the O.C. of the lens should be lowered 1mm
- **c.** Pantoscopic tilt does not affect O.C. placement
- **d.** For every 2mm of pantoscopic tilt the O.C. of the lens should be lowered 1 degree

5. What is "Standard Alignment"?
- **a.** Frame adjustment, making sure it is not distorted from its natural shape
- **b.** Also referred to as the "four-point touch"
- **c.** Frame adjustment after verification, prior to delivery
- **d.** All of the above

6. What is "Xing"?
- **a.** Two eyewires skewed in opposite directions, when viewed from above and sideways
- **b.** Filling in boxes on a lab order form
- **c.** Also referred to as "propellered front"
- **d.** A and C

7. What is the "Table Top Test"?
- **a.** A good way to check standard alignment
- **b.** An inverted frame on a table top, temples open, checking for wobble
- **c.** A and B
- **d.** A way to check for lens aberrations

8. Why place the glasses on the patient the first time?
- **a.** Only the optician knows how to correctly put on glasses
- **b.** The patient expects this as part of the service
- **c.** A dispensing fee cannot be billed to insurance companies unless this is done
- **d.** If substantial adjustment is needed, the eyewear can then be removed immediately to avoid a negative first impression

9. Ink marks are helpful when dispensing progressives:
- **a.** To identify fitting cross position
- **b.** If troubleshooting is required
- **c.** To verify fitting data
- **d.** All the above

10. Increasing the vertex distance of a lens will:
- **a.** Make a "plus" lens effectively more plus
- **b.** Make a "minus" lens effectively less minus
- **c.** Make a "plus" lens effectively less plus and a "minus" lens effectively more minus
- **d.** A and B

11. Compensating power for vertex:
- **a.** Has no effect and is unimportant
- **b.** Will change the effective power
- **c.** Saves the patient money
- **d.** Make the lens thicker

12. An instrument used to measure vertex distance is a:
- **a.** Vertometer
- **b.** Lensometer
- **c.** Distometer
- **d.** Transilluminator

13. The angles of concern for nose pad alignment are:
- **a.** The frontal/spread angle
- **b.** The splay angle
- **c.** The vertical angle
- **d.** All of the above

14. Rules for nose pad adjustment include:
- **a.** Make all three angles flush with the skin
- **b.** The pad arm loop should be large to maintain the correct vertical angle
- **c.** Angled slightly toward the face to follow the natural contour of the side of the nose
- **d.** A and C

15. What frames are best for patients with very flat bridges?
- **a.** Zyl frames
- **b.** Metal frames with unifit bridges
- **c.** Frames with adjustable nose pads
- **d.** Any frame would work for these patients

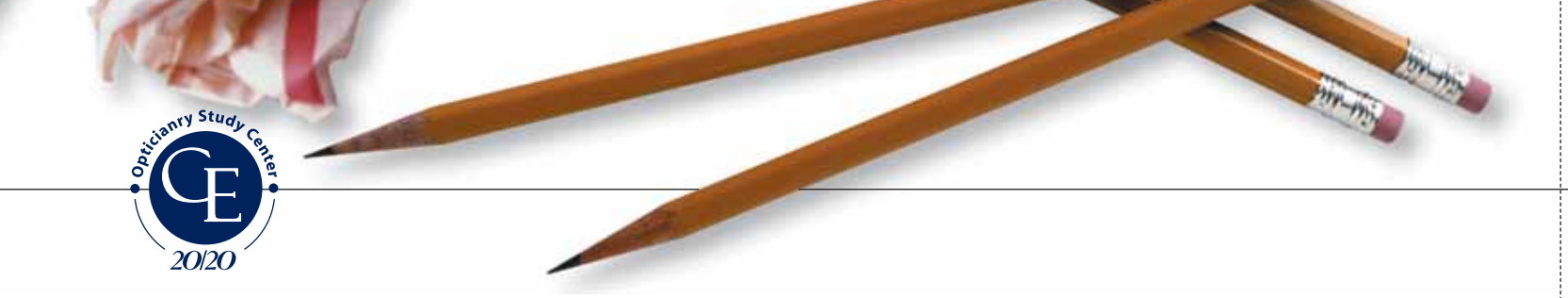
16. In order to achieve the best vision, the O.C.'s should be:
- **a.** Level with the pupils
- **b.** Level with the pupils only if the patient is perfectly symmetrical, if they're not, don't worry about it
- **c.** As level with the pupils as possible allowing for asymmetry
- **d.** A and C

17. The patient bases their first impression of their new eyewear on:
- **a.** How level their eyebrows are and how comfortable the frame is
- **b.** How much they spent
- **c.** The refractive index of the material used
- **d.** How their eyewear is placed on their head the first time by the optician

18. If the frame front is tilted:
- **a.** Always correct in the direction of the tilt
- **b.** Angle the temple up on the side that is lowest
- **c.** Angle the temple down on the side that is the highest
- **d.** All of the above

19. Vertex measurements are important because:
- **a.** It's fun
- **b.** May be required for personalized free-form lenses
- **c.** Justifies higher charges
- **d.** It's not important

20. The optician's primary role(s) in the delivery process is:
- **a.** To use all the resources at their disposal to make the finest pair of glasses the patient has ever had
- **b.** To put as much attention into fitting and adjusting the finished product
- **c.** To apply their technical knowledge and eye for fashion throughout the entire process
- **d.** All of the above



Examination Answer Sheet

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