



**1 CE Credit**

## Getting Adjusted—Part 2

By Andrew Bruce, ABOM

*In Part 1 of “Getting Adjusted” we reviewed pre-fitting the frame prior to taking segment and O.C. height measurements, the effects of pantoscopic, “standard alignment” and the “table-top test.” We described the delivery of finished eyewear, vertex distance and its effect on effective lens power, nose pads adjustment, and how to adjust for tilted frame fronts.*

*See the January issue of 20/20 Magazine. In Part 2 we will discuss tilt and its importance on quality vision; address horizontal misalignment; review the “fitting triangle” and three-point touch. Frame fitting pearls; temple shortening and the results of a survey of what patients expect from their optician round out this course.*

**Release Date:** April 2010

**Expiration Date:** March 1, 2015

**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.

**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 # STJMI064-2

This CE is also available online at [www.2020mag.com](http://www.2020mag.com)

Please check with your state licensing board to see if this approval counts toward your CE requirement for relicensure.

Here’s the scene: The lab has returned the patient’s new eyewear and you sit before the patient ready to dispense the glasses. The nose pads are sitting well on the bridge and the frame front has been made level.

**Pantoscopic Tilt** — Check the amount of pantoscopic tilt applied—as mentioned earlier, it should be between 5 and 15 degrees. Have the patient turn their head so the angle of tilt can be evaluated from the side. For most lenses, the need to precisely measure the pantoscopic angle rarely

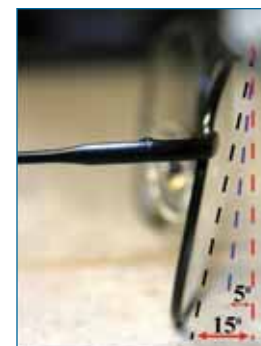
presents itself. However, for new personalized lenses, there are PD rulers and gauges that display protractor markings or have a needle device that points to a particular angle. The new personalized freeform lenses do require vertex, tilt and faceform measurements so get ready.

Become familiar with the visual appearance of angles between 5 and 15 degrees (Figure 1). This allows the optician to estimate the angle required when the patient is wearing the frame.

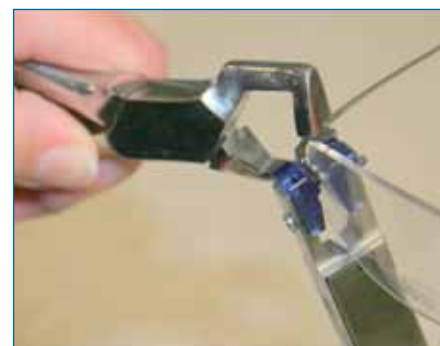
This is especially important with a bifocal or progressive, making sure the segment is in the correct position when looking down to read. If there is an insufficient amount of pantoscopic tilt, the patient can be looking under the frame or, at least, the field-of-view for near work will be narrowed due to the increased vertex distance between the eye and the segment. This is also referred to as the “keyhole effect.”

As the eye rotates along the vertical axis, to look up or down to read, the tilt of the frame maintains equal distances between the lens and eye maximizing fields-of-view, ensuring the optical axis of the lens passes through the center of rotation of the eye to maximize visual comfort.

When changing pantoscopic tilt, use the wide-jaw angling



**FIGURE 1:**  
Pantoscopic  
Angle Extremes



**FIGURE 2:** For rimless, use a wide-jaw angling plier and brace the front over the drill holes. Be sure that the plier jaws do not crimp the lower lens edge.



pliers to change the angle of the temples while bracing the frame front with a separate pair of pliers. Carefully apply force in the direction needed. This is especially important when handling three-piece rimless mountings. Protect the lens from the force necessary to change the tilt (Figure 2) with bracing pliers such as the “three-piece adjusting pliers.”

**Vertex Distance**— Lenses should appear equidistant to each eye. With the patient seated and tilting their chin down, observe the frame front from above by standing and looking down. If one lens appears

Conversely, increasing the horizontal angle between the frame front and the temple of the opposite side is also an option, effectively moving the temple away from the head. The same way pantoscopic tilt affects the vertical placement of the lens optical center, face form— positive or negative—will also affect the horizontal placement of the lens optical center.

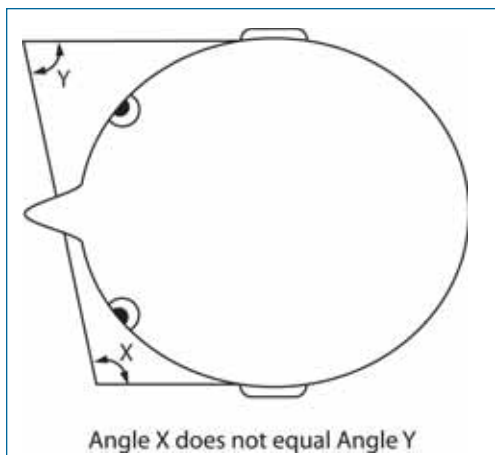
However, it is NOT recommended to compensate for face form by ordering an incorrect PD. It will create lateral prism. On occasion, patients’ glasses will get out of adjustment due to wear and tear, and the

for the patient as their eyes move laterally (Figure 5).

### THE FITTING TRIANGLE

The frame should touch at only three points, which form “the fitting triangle”— the nose, and the top of each ear. If the frame is touching the head at other places, the frame selected may be too small for the patient.

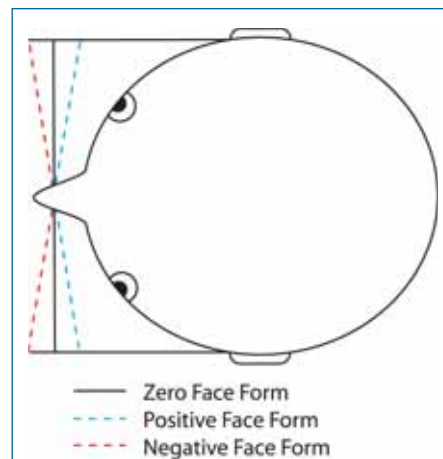
Temples leave “rail-road tracks” (impressions of the temples) along the sides of the head toward the ears; this will actually force the frame to slide forward. Try



**FIGURE 3:** Modified from “System for Ophthalmic Dispensing” by C.W. Brooks: p177



**FIGURE 4:** Adjust the angle of the endpiece to equalize vertex distance.



**FIGURE 5:** Adjust face form for a natural look and for visual comfort

closer to the eye than the other, the fitting error may be due to the temples being at unequal angles to the frame front from the endpiece, when extending backwards. On the other hand, the patient’s eyes may simply be more inset on one side than the other (Figure 3).

Whichever lens is closer to the eye, the same side temple needs to be brought closer to the head. Reduce the horizontal angle between the frame front and the temple using a pair of flat/round metal pliers at the end piece (Figure 4).

patient resorts to bending them—adding face form. The patient then adapts to looking through their lenses this way and when receiving new glasses, may complain about the difference in the PD and its effects on vision. Some adjustment and period of adaptation may be necessary to make the patient comfortable while the optician works with the patient to get back to the way their eyewear should fit. Applying positive face form so the frame follows the natural curve of the face is a good rule of thumb, thus minimizing visual problems

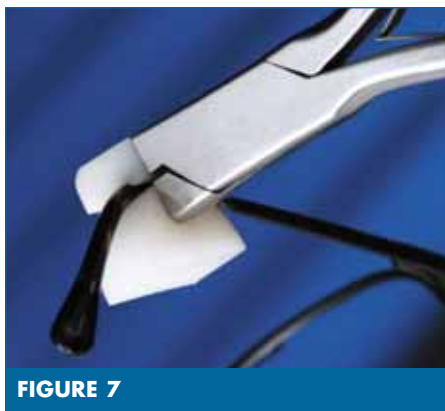
spreading the temples out horizontally away from the frame front at the end piece; again for metal frames use a flat/round metal plier. With zyl frames, heat up the frame at the end piece and apply pressure using the hands to increase the horizontal angle between the temple and frame front equally on both sides. Then using eye-wire shaping pliers (or well-trained fingers) with the concave side facing toward the inside (Figure 6), apply a gentle curve to the temples so they are not in contact with the head. With zyl temples, heating may be



## Getting Adjusted - Part 2



**FIGURE 6:** Adjust the temple or the curve of the eyewire to remove temple tension at the side of the head.



**FIGURE 7**

necessary to permit this manipulation. Try for touch only at the top of the ear.

### BEHIND THE EARS

When adjusting behind the ears, the temple should curve just above the ears and follow the line of the back of the ear. Temple bending pliers can be used or well-trained fingers (Figure 7). It should be at an angle of approximately 45 degrees from the temple bend at the crest of the ear and it should not put excessive pressure on the back or top of the ear (Figure 8).

If the bend begins too soon before the crest of the ear, it will rub and irritate the top of the ear. It will also cause the temples to rise up from the ears adding tilt to the



**FIGURE 8:** Avoid the mastoid bone but ensure the bend is at the crest of the ear, not behind it as in this illustration.

frame front. If the bend begins after the top of the ear, the temple will either not conform to the curve of the ear or it will need to be bent at a greater angle than 45 degrees and the tip will rub and irritate the back of the ear. The glasses will also slide down the nose.

When adjusting temples, be careful to be aware of the mastoid process. This is a bone that protrudes from the skull, behind the ear; in some patients it is more prominent than others. If the temple tip rubs against the mastoid process, it can cause serious discomfort so should be avoided. Regardless of the optician's skill level, a visual inspection of the temples behind the ears should always be done to ensure optimum comfort for the patient.

Prior to checking behind the ears for fit, always ask the patient for permission. Some patients are uncomfortable with an invasion of their personal space. If the patient is a minor, always check with the parent. When checking behind the ears, look for white pressure points where the temple tip is touching the head and ear. If present, adjust the temple tip away from the pressure points until resolved. The temple bend should also follow the line of the side of the head. In order to do this the tip will need some angling in toward the head.

Be sure the bend point of the temple is NOT the only part of the temple touching

the head behind the ear leaving a space at the bottom between the head and temple tip. Conversely, the temple should not just be touching the head with the lower tip of the temple creating a space between the head and the temple at the top of the ear. In the first instance, if the temple is in contact with the head only at the bend at the top of the ear, adjust the temple tip so that it angles in toward the head just enough to gently touch. In the second, if there is a space between the temple and head at the bend, the tip is angled in toward the head an excessive amount; adjust the temple tip away from the head so it is bending in less.

Occasionally, in this case, the temple itself may need angling "in" a little at the end piece. A flat/round metal plier can be used with a metal frame to reduce the horizontal angle between the temple and frame front, in order to provide a snug fit. Heat and pressure using the thumbs, or a tabletop, at the end piece may need to be used with a zyl frame to obtain the same result. The more touch, the more friction and the better the temples will do the job i.e., hold the glasses in place.

### TEMPLE LENGTH

Although temple length should be evaluated as a part of the initial frame selection, sometimes a frame may be selected that does not offer the option of an alternate temple length. Although patients may not



**FIGURE 9**

express a concern if a temple is a little short, extending the temple bend backwards toward the end may provide an acceptable fit. Be sure that there is enough touch to provide good frame stability. If the temple is too long, however, most patients will be unhappy with an inch or more of the temple sticking out below their ear. Once again, don't settle for second best—take care of every detail.

If the standard temple is metal with slip-on covers as temple tips, it can often be easily modified to accommodate the need for longer or shorter temples. In the case where the standard temple is too short, straighten the temple out and simply slide the tip cover off about 5mm and then re-adjust the bend. If the standard temple is too long, straighten the temple out and completely remove the tip cover. Using a pair of cutting pliers (Figure 9), shorten the metal temple core by 5mm to 10mm, slip the tip cover back on and reapply the bend. Some metal temples have a different shape or form beyond the tip cover so it may also be necessary to modify the tip cover by shortening it by the same amount as the temple. Using a file or fine emery paper, smooth the rough tip of the core and the left over rough edges of the tip cover before sliding on the temple cover.

Often polishing the cover opening helps reduce any roughness that might irritate

the ear and get caught in the patient's hair. Re-adjust the bend and repeat as needed until the required length is determined. Initially, this may take some time to perfect, but with practice you will become skilled in determining the shortening required.

Unfortunately, this is more complex with zyl temples and often not possible since zyl has a metal core that may protrude from the end once cut. While modifications can occasionally be done, it is often best to discourage zyl frames with inappropriate temple lengths. Most metal temples can also be modified to accommodate cable temple tips, if beneficial for the patient, by using a similar procedure as described above. Specific

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### **TAKING THE EXTRA STEPS AT THE TIME OF DISPENSING WILL RESULT IN LESS TIME SPENT RE-ADJUSTING GLASSES BECAUSE THE PATIENT HAS TO RETURN DUE TO A POOR INITIAL FITTING.**

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directions on temple modifications can be found in "System for Ophthalmic Dispensing" 3rd edition by C.W. Brooks, an excellent reference for opticians of all levels.

#### **HOW IMPORTANT ARE ADJUSTMENTS**

In order to determine what patients expect

the most from opticians, 100 patients were randomly surveyed over a two-month period in a private, three-doctor optometric office.

On a scale of 1 to 5, (1 = "Not at all," 5 = "The most important") patients were asked **How important is it to you that your optician is:**

- Knowledgeable
- Friendly
- Able to fit your glasses well
- Able to select a good choice of frame

The results of the survey were:

- 93 percent of the patients consider being able to fit glasses well as their most important need from their optician.
- 73 percent of the patients indicated their greatest frustration with previous eyewear was that the eyewear was poorly fit and uncomfortable.

This strongly suggests that opticians need to be skilled in the art of eyewear adjusting and fitting, and patient comfort is the key to happier patients.

#### **CONCLUSION**

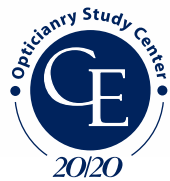
The optician's major role, although highly technical, is to use their skills and expertise to ensure patient comfort and satisfaction with their eyewear. Taking the extra steps at the time of dispensing will result in less time spent re-adjusting glasses because the patient has to return due to a poor initial fitting. It also ensures less inconvenience for a patient having to return to have done what should have been done in the first place.

Most importantly, having the patient leave the office totally satisfied with ALL of the services they received—having the utmost confidence in the entire staff and their abilities, and excited to tell others about their wonderful experience and show off their new eyewear that they will enjoy wearing for many years to come. ■



## Self-Assessment Examination

1. Having insufficient pantoscopic tilt:
  - a. Is better than excessive tilt
  - b. Can cause the patient to look under the frame
  - c. Will narrow the near field-of-view
  - d. B and C
2. The correct amount of pantoscopic tilt:
  - a. Is especially important with a multifocal lens
  - b. Widens the near field-of-view
  - c. Maintains equal vertex distances
  - d. All of the above
3. When changing pantoscopic tilt, bracing the frame and lens with pliers:
  - a. Protects the lens
  - b. Makes the optician look more skilled
  - c. Is only necessary with expensive lenses
  - d. Is unnecessary and awkward
4. If one lens is closer to the eye than the other:
  - a. This is due to the patient's asymmetry
  - b. The same side temple as the lens that is closer, needs to be brought closer to the head
  - c. The same side temple as the lens that is closer, needs to be moved further away from the head
  - d. Always view the glasses from a side view
5. Face form:
  - a. Can be positive or negative
  - b. Will affect the horizontal OC placement
  - c. A and B
  - d. Compensates the PD ordered
6. To provide superior vision, the frame should:
  - a. Have zero face form
  - b. Have enough positive face form to follow the natural curve of the face
  - c. Have enough negative face form to follow the natural curve of the face
  - d. Have face form based on pantoscopic tilt
7. The "fitting triangle" describes:
  - a. Frame touch at three points on the head
  - b. Frame shape for a triangular-shaped face
  - c. An imaginary triangle; the patient's two eyes and nose
  - d. None of the above
8. "Rail-road tracks" along the sides of the head:
  - a. Are impressions of the temples
  - b. Indicate the frame may be too small
  - c. Mean the frame is fitting well
  - d. A and B
9. When adjusting temples behind the ears:
  - a. The temples should be as tight as possible
  - b. The bend angle is about 45 degrees
  - c. The bend begins 10mm before the ear
  - d. The bend begins 10mm after the top of the ear
10. The mastoid process is:
  - a. A protrusion from the side of the nose
  - b. A bony structure inside the orbital cavity
  - c. A bone that protrudes from the skull, just behind the ear
  - d. None of the above
11. Physical inspection of temple fit behind the ears:
  - a. Should always be done to ensure optimum comfort
  - b. Need only be done when a patient returns complaining of discomfort
  - c. Need only be done by opticians with less than two years experience
  - d. Should be done only when time allows
12. When inspecting temple fit behind the ears:
  - a. Always ask the patient for permission
  - b. If the patient is a minor, it is not necessary to ask permission
  - c. It is unnecessary to ask
  - d. A and B
13. With regards to temple length:
  - a. If a metal temple with tip covers is too short, it cannot be physically made longer
  - b. The length of a metal temple with tip covers can often be easily modified
  - c. Zyl temple length is the easiest to modify
  - d. Modifying the temple length voids the manufacturers' warranty
14. The author recommends as an excellent reference:
  - a. Ophthalmic Lenses & Dispensing
  - b. System for Ophthalmic Dispensing, 3rd edition
  - c. Clinical Optics
  - d. Optical Formulas Tutorial
15. In the survey, what percentage of patients consider being able to fit glasses well their most important need from their optician?
  - a. 73 percent
  - b. 50 percent
  - c. 85 percent
  - d. 93 percent
16. In the survey, what percentage of patients indicated their greatest frustration with previous eyewear was that the eyewear was poorly fit and uncomfortable?
  - a. 93 percent
  - b. 37 percent
  - c. 73 percent
  - d. 55 percent
17. The tip of the temple after the bend should do all of the following except:
  - a. Follow the natural line of the head
  - b. Follow the natural curve of the back of the ear
  - c. Avoid the mastoid process
  - d. Create white pressure points
18. Making sure every detail is given attention during the dispensing process:
  - a. Saves time and inconvenience for the patient and optician
  - b. Most patients are in a rush, just cover the basics
  - c. Patients leave the office totally satisfied with ALL the services received
  - d. A and C
19. All of the following are part of the eyewear fitting process when dispensing completed eyewear except:
  - a. Nose pads are sitting comfortably on the nose
  - b. The frame front is level on the patient
  - c. Measure the PD
  - d. Temples fit comfortably behind the ears
20. The optician should:
  - a. Combine style and fashion in the eyewear selection process
  - b. Make sure the patient's eyewear is fit well
  - c. Provide superior vision and is cosmetically appealing
  - d. All of the above



**Examination Answer Sheet**

1 hour of CE credit by the American Board of Opticianry ~ Valid for credit through **March 1, 2015**  
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**Getting Adjusted – Part 2**

**Directions:** Select one answer for each question in the exam and completely darken the appropriate circle.  
 A minimum score of 80% is required to obtain a certificate.

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|---|---|--|
| 1. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D  | 11. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | <b>1=Excellent</b> <b>2=Very Good</b> <b>3=Good</b> <b>4=Fair</b> <b>5=Poor</b>  |
| 2. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D  | 12. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | <i>In questions 21-23 please rate the effectiveness of each activity:</i>  |
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| 4. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D  | 14. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 22. Avoided commercial bias/influence? <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5                                   |
| 5. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D  | 15. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 23. How would you rate the overall<br>quality of the material presented? <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 |
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| 9. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D  | 19. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | <input type="radio"/> C NYSSO Website  |
| 10. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 20. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 25. Please describe the office in which you work.  |
|   |   | <input type="radio"/> A Independent Optician <input type="radio"/> C Chain retail  |
|   |   | <input type="radio"/> B Independent Optometry <input type="radio"/> D HMO/Military/Other   |

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