Hello! Welcome to your eyeLEARN training resource. Today’s topic is measuring the patient for multi-focal lenses.

This course is intended as an introductory learning tool for new staff members and as a refresher course for more experienced staff.

The ultimate goal of this course is to assist the staff member in correctly measuring a patient for correct placement of their multi-focal lenses.

Before measuring the patient for their new lenses, you should adjust the display frame to fit the patient – even if the actual frame will be drop-shipped and not sent from the board!

We do this in order to get the most accurate measurements possible! Remember that any adjustments made to a frame for a comfortable fit to the patient will have a direct impact on the placement of the multi-focal segment in relation to the wearer’s line of sight. Therefore, if you adjust the “test” frame before measuring, you will have much better results for the patient’s comfort and use of their lenses.

Adjusting the frame should be done in a specific order: first from the front to the back, and second, adjust from the nasal area to the temple.

When measuring PDs, be sure to use monocular PDs with Progressive lenses, while Bifocals and Trifocals should be used with binocular PDs. There is one exception to Bifocals and Trifocals: if the patient displays a large disparity in their PDs, greater than 3mm. However, when doing this, you must put a note in the RX notes of Eyecare informing the lab to fabricate the lenses using this “mono” PD.
Remember the rule of convergence when measuring for multifocals.

Convergence is the natural movement of the eyes downward and inward nasally when viewing things close up. This movement is approximately 10 mm down and 3 mm nasally converged. In patients displaying a PD greater than 70 mm, the inward convergence is approximately 4 mm. Think of the inward convergence as the difference between a “far” PD, and a “near” PD.

Keeping convergence in mind makes us aware of where the patient’s focus will be in the lens so that when the patient looks through the lens, the bifocal or trifocal line will not hinder their vision.

The importance of segment placement is vital to both patient satisfaction and safety.

What is a parallax error and how do we avoid it? Parallax is the apparent displacement of an observed object due to a change in the position of the observer.

If you should hold your thumb against an object with one eye closed and then switch eyes, you will notice that it appears that your thumb changes position. This is what happens should you not place yourself directly in front of and on the same level as your patient. You would create a parallax error.

It is imperative to be level with and directly in front of your patient when measuring segment placement. If you are in any other position the potential for placing the segment either too high or too low is increased.

Most lined segments have their optical centers “on center” or in the middle of the segment. This is important to remember when measuring for segments that have higher add powers. For instance, if you should measure and place +3.00 Diopter add power in a lined bifocal too far below the lower lid line, your patient will never experience the full power of that lens, and could lead to dissatisfaction, remakes, and doctor Rx checks. All of these would be unnecessary if the optician asked a few simple, and direct questions prior to measuring. In this case, if the patient requested the segment placed lower, it would be appropriate to have your Doctor reevaluate the add power.

By asking various lifestyle questions as shown here, an optician can quickly discern where the most appropriate placement of the segment should be for each patient. Many patients incorrectly assume that lined segments are just going to be difficult. Proper coaching on head placement, work arrangements, seating, and lighting can go a long way to ease patients into new multifocal lenses.

Understand that all lined segments have “image jump.” Image jump is defined as a displacement of the image when fixation moves across the top edge of the bifocal segment. Jump is defined as the prism at the top edge of the segment, the product of the power of the Add in diopeters and distance from the optical center of the segment to its upper edge in centimeters. There is a way to calculate and compensate for this, but it is only necessary when the patient is experiencing diplopia (double vision) or a great vertical imbalance or prismatic effect.
Properly pre-adjust the frame to the patient.

1. Adjust your gaze to the exact same level as your patient to avoid parallax errors.

2. Ask your patient to gaze directly forward and be certain to let them know that it is O.K. to blink.

3. Until you become skilled, or you have a previous bifocal wearer at your dispensing table, you may use a wet erase marker and draw a line across the lens where the segment would be placed. This allows for an easy measurement for the optician, as well as allowing the patient to see where the line will fall in relation to their distance gaze. Another tip is to place a piece of transparent tape across the lens at the lower lid line. This gives the patient a very clear idea of where the segment will be placed. This is often very useful for brand new lined segment wearers.

**The lens should be marked at the lower eyelid.**

*Exception*: Note where previous patients wear their segment and ask if they are satisfied with their use.

With either the line or the tape on the lens, you can easily measure from the mark to the lowest part of the eyewire. **This is crucial.**

A common mistake that new opticians make is that instead of using the PD stick to measure into the deepest part of the eyewire, they will measure directly under the eye itself. We need to remember that we are not measuring where to place the segment horizontally because that is what the PD measurements will do; instead, we are measuring where the segment will be placed vertically so the lab will be able to align the segment with the patient’s lower lid.
After determining the distance from the lower lid to the deepest part of the eyewire, you will need to add .5 mm (one-half of a mm) to account for the lens to sit within the bevel on either a zyl or full metal rimmed frame. This would not be necessary on semi rimless, or drill and pressure mounted lenses, as there is no bevel.

Record your measurement in the appropriate fields as a whole number in EyeCare.

Let’s move on to lined trifocals.

Lined trifocals are measured to the patient’s lower pupil margin, or where the pupil meets the iris. When properly measured and fabricated, the patient will have a direct straight ahead view through the distance portion of the lens, and with a minor downward shift of their gaze will have a comfortable intermediate field of vision. Most intermediate tasks are done with the patient looking slightly downward such as using a computer or reading a speedometer.

With the trifocal line placed in this position it will ensure that the reading portion of the lens is not too low for effective use.

You will find that these instructions are almost the same as measuring for bifocals. When measuring for lined trifocal segments you should take the following steps:

- Pre adjust the frame to the patient
- Align yourself directly across and on the same level as your patient
- Ask your patient to gaze directly forward and be certain to let them know that it is O.K. to blink.
- Until you become skilled, or you have a previous bifocal wearer at your dispensing table you may use a wet erase marker and draw a line across the lens where the segment would be placed. This allows for both an easy measurement for the optician, as well as allowing the patient to see where the line will fall in relation to their distance gaze. Another tip is to place a piece of transparent tape across the lens at the lower lid line. This gives the patient a very clear idea of where the segment will be placed. This is often very useful for brand new lined segment wearers.

Lined trifocals are measured to the lower pupil margin, or where the pupil meets the iris (the colored portion of the eye).

Exception: Note where previous patients wear their segment and ask if they are satisfied with their use.
With either the line on the lens or the tape, you can easily measure from the mark to the lowest part of the eyewire. **Just like with bifocals, this is a crucial step and it bears repeating:**

A common mistake that opticians make is that instead of using the PD stick to measure into the deepest part of the eyewire, they will measure directly under the eye itself. We need to remember that we are not measuring where to place the segment horizontally because that is what the PD measurements will do; instead, we are measuring where the segment will be placed vertically so the lab will be able to align the segment with the patient’s lower pupil margin.

After determining the distance from the lower pupil margin to the deepest part of the eyewire, you will need to add .5 mm to account for the lens to sit within the bevel on either a zyl or full metal rimmed frame. This would not be necessary on semi rimless, or drill and pressure mounted lenses as there is no bevel.

Next carefully enter this calculation as a whole number in the appropriate space in Eyecare.

A few important notes about splitting segments. Often an optician will want to place lined segments at different heights due to a patient’s asymmetrical facial shape. This is generally not a good idea unless the difference between the two measurements is 2.5mm or greater.

Splitting the segment heights often will cause issues for the patient due to the perceived “mistake” in lens fabrication. This is another reason that we do not use the monocular PDs unless the discrepancy is greater than 3mm. Instead of splitting the segments, use the lower measurement of the two to avoid any conflict with the patient’s distance vision.

Often you will have a patient that is clearly wearing their segments in an improper place. Rather than being a “hero” to these patients it is wiser to ask questions to determine if they are pleased with the optical performance of their lenses. Often an optician will notice that a patient has been wearing their segment low and will automatically measure for the new lens with the segment placed correctly. The patient may have adapted or requested that the segment have been placed this way.

The best practice would be to ask the patient and make the appropriate documentations in the spectacle Rx screen in Eyecare as well as the notes.

Now let’s talk about measuring for Progressives. Progressive addition lenses or “PALS” are so called because they allow a seamless, progressive transition from a distance to intermediate to near vision with just subtle eye movements by the patient. These lenses gain “plus” power as the gaze is directed downward through an intermediate corridor to a near vision zone. The technology is now to the point where there are both “short corridor” progressives, those that may be placed with a segment height around 14mm, and the more traditional progressive lenses ranging from 18mm to 24mm.

The technology of these lenses has advanced in recent years to include digitally surfaced lenses that all but eliminate the “blurred” peripheral areas of their predecessors. At one time the more negative term of “unwanted astigmatic correction” was used to define these areas of blur and the non-adapt rate was considerably higher.
When measuring for progressive lens segments you should take the following steps:

- Pre adjust the frame to the patient
- Align yourself directly across and on the same level as your patient
- Ask your patient to gaze directly forward and be certain to let them know that it is O.K. to blink.
- Until you become skilled, or you have a previous progressive wearer at your dispensing table you may use a wet erase marker and place a small dot on the lens where you see the pupil.

**Progressive lenses are measured to the center of the pupil. A small pen light may be used to create a reflection from the center of the pupil to make this an easy measurement to take.**

**Exception:** Note where previous patients wear their segment and ask if they are satisfied with their use.

With the dot on the lens you can easily measure from the mark to the lowest part of the eyewire. A common mistake that opticians make is that instead of using the PD stick to measure into the deepest part of the eyewire, they will measure directly under the eye itself. We need to remember that we are not measuring where to place the segment horizontally because that is what the PD measurements will do; instead, we are measuring where the segment will be placed vertically so the lab will be able to align the segment with the patient’s pupil.

After determining the distance from the pupil to the deepest part of the eyewire, you will need to add .5 mm to account for the lens to sit within the bevel on either a zyl or full metal rimmed frame. This would not be necessary on semi rimless, or drill and pressure mounted lenses as there is no bevel.

Next carefully enter the measurement as a whole number in the appropriate space in Eyecare.