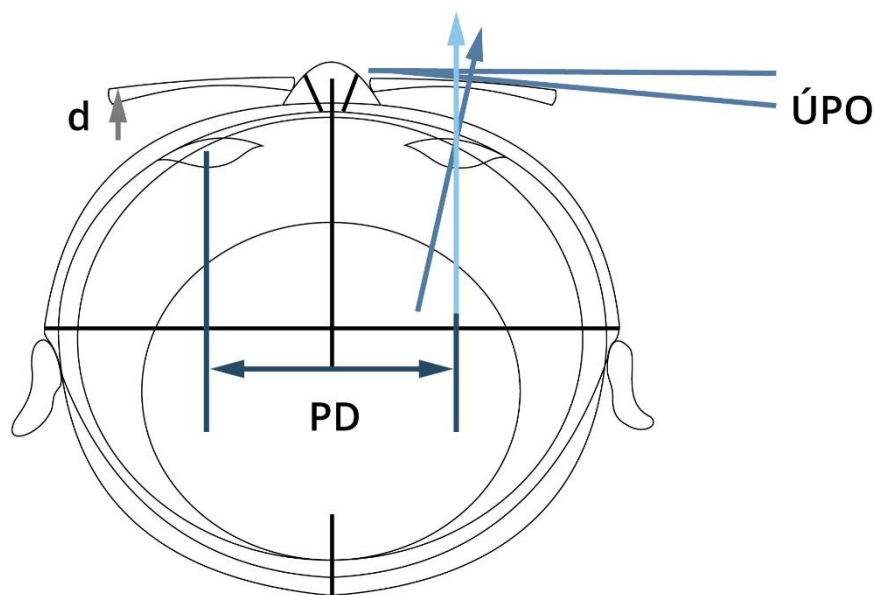# 5 Spectacle frame wrap angle measurement

5.1 Introduction

Wrap angle of the frame has influence on quality of imaging. Picture 5.1. show us wrap angle of the frame. We can see that optical axis is not equal with fixation axis. Individual spectacle lenses enable to compensate astigmatism which is generated by wrap angle of the frame. There is theoretical possibility to decentre spectacle lens' optical center into the temporal side to maintain proper imaging conditions. If we do this peripheral decentration we increase prismatic effect in horizontal direction. In practice manufacturer can apply negative astigmatism power which eliminate astigmatism caused by wrap angle of the spectacle frame (Najman 2010).

Picture 5.1: Wrap angle in spectacle frame (green arrow = axis of the spectacle lens, red arrow = fixation axis) (inspired by Eyesite 2013)

5.2 Goals

- Measure wrap angle of the spectacle frame (γ)
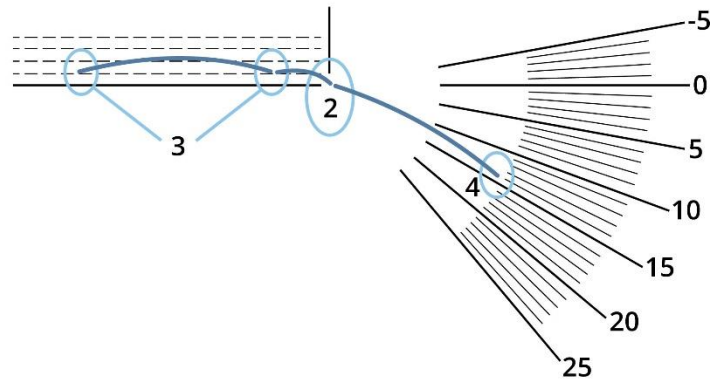- Calculate theoretical decentration of the spectacle lens

5.3 Equipment

Spectacle frame, handy rule or PD meter, writing staff, calculator, centration template

5.4 Methods

Measure wrap angle of the spectacle frame (γ)

With help of angle meter or centration template measure wrap angle γ according picture 5.2.

Picture 5.2: Measuring of the spectacle wrap (inspired by Pals-n-all 2013)

Calculate theoretical decentration of the spectacle lens

If we want to calculate temporal decentration of the wrapped frame we need to measure vertex distance. This task we can do with handy rule for example. If we know wrap angle and vertex distance we can calculate temporal decentration of the spectacle lens.

$$h_T = d + 13 * tg\frac{\gamma}{2} \qquad \text{[mm], [°]} \qquad\qquad (19)$$

5.5 Results

Measure wrap angle of the spectacle frame (γ)

Schematically draw shape and wrap angle of the spectacle frame into the protocol. Describe size of the wrapping.

γ =

Calculate theoretical decentration of the spectacle lens

h_T =

5.6 Discussion

So called spectacle frame's wrap angle is important parameter for manufacturing of the individual spectacle lens. These lenses are manufactured exactly according parameters of the customer's frame. It is also important in spectacles for sport to adapt spectacle's lens optical center.

5.7 Conclusion, notes, comments

Why we use in calculation formula only half of the wrap angle?

Which methods you can use for measurement of the wrap angle?