

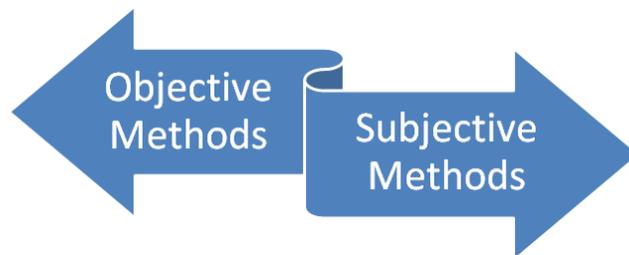


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Clinical Refraction – An art that links present with past and future

The purpose of the visual system is to cast an image of an external object into the photoreceptor layer of retina. If the system works perfectly, all the rays of light from a distant point will come to focus at one single point on the retina. In case rays of light do not converge at the single point on the retina, the optical system is said to have refractive error. **Clinical refraction is the process that an eye care practitioner adopts to measure the presence and amount of refractive error.** There are two methods that an eye care practitioner follows on each of his patient –



Objective method measures the refraction without any input from the patient and provides a lens that neutralizes the amount of refractive error and brings the **rays of light focused onto the retina**. If you consider the eyes being a visual system only, this is a good enough process to correct the refractive error. But the eyes are more than a mere visual system; they are an important organ of human being. And all the treatments are done for the human being as a whole, not for the organ itself. This is the reason why the true objective of clinical refraction is not to prescribe a lens that brings the rays of light focused back onto the retina but **to provide the patient clear and comfortable vision to which he can adapt quickly and which allows him to work for a longer period of time without any symptoms**. It is for this reason another method is applied to decide the lens power that will be prescribed. This is done by applying the subjective method of refraction. Subjective refraction allows the clinician to use different lenses to arrive at the dioptric lens combination that results in **maximum visual acuity**. Since the maximum visual acuity depends on the patient's subjective response, ocular conditions and practice philosophy of the clinician, the resultant dioptric combination may not always represent the pure refractive error. The subjective responses vary based upon following factors:

1. Target being presented
2. Subject's ability to discriminate between two lenses
3. Distance between the subject and the target
4. Subject's intelligence and past experience
5. Accustomed visual imagery
6. Poor observer or malingering patients will mislead
7. Health status of the eyes and visual system
8. Systemic health

The straight forward meaning is that the examiner has to apply intellectual process whereby he gathers the information about patient's history, his chief complains, current status of the eye, his visual needs and also the results of the objective refraction. He relates all the collected information, makes a judgment to decide the goal for the management and then decides the lens diotric power to prescribe. This is where his past habits, present symptoms and adaptability with the lenses that he would be wearing post refraction guide him to make a decision.

While taking the clinical decision he is also influenced by issues related to adaptation. When a spectacle lens is worn a series of changes is noticed in visual performance. Some of these changes are intended and others come along. The unintended changes cause adaptation issues. All clinician would like to minimize the effects of unintended changes. Plus lens brings in base in prismatic effect, whereas minus lens brings in base out prismatic effect. Neuro-muscular mechanism of the ocular system is affected through their influence on accommodation. A young hyperope who could manage to see distance with accommodation and needed to accommodate more to see near, do not need to make an effort to accommodate for distance vision if he uses plus lenses. A young myope who could see near without using accommodation has to start accommodating to see at near if he uses minus lenses. Cylindrical changes can induce symptoms of sloping floors and changes in the shape of objects. For some patients it may be an unpleasant experience as they may experience certain unusual sensations and may result in rejection by the patient. **In order to avoid such situations the clinician adjusts the results of objective refraction to help patient adapts to new correction quickly and easily.** That is why most clinician is of opinion "If the patient is happy with the correction, why change it? The only thing you do by changing the prescription is introducing the possibility that the patient will not appreciate the new correction". **This also explains why lens prescription differs from an eye care practitioners to another.**

Reference:

1. Clinical Refraction Guide By, Ajay Kr Bhootra
2. Borish's Clinical Refraction By , William J. Benjamin
