

# The Focometer: Use in Aphakic Correction

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The focometer is a monocular hand held device, which is used in natural lighting and allows an individual's refractive power to be read off a linear dioptre scale. Patients rotate the focometer till the best focus is achieved. For the first time, we used the focometer for aphakic correction in rural India where access to refractive services is poor. Since the focometer reads accurately only up to +9 D, it was used in conjunction with a trial frame with +5D lens. In rare instances, it was read with +10 D lenses.

Focometer readings were obtained for 188 cataract-operated eyes, operated on within a four-year period. Focometer refraction improved vision of all aphakes. The presenting vision with available aphakic correction was < 6/60 in 18.9 per cent. All these patients could be improved with the focometer. Only 3.1 per cent of the patients had a presenting vision of better than 6/18, with available aphakic spectacles. With focometer refraction, 18.0 per cent could be improved to better than 6/18 (See Table).

## Aphakic Correction: Benefits

In India, till recently, it was a common practice to dispense universal +10 D spectacles to all cataract operated patients. Nearly a third of these patients are not satisfied with this correction. Unfortunately, refraction services are only available at upgraded primary health centres, which cover a population of more than 100,000. Thus, operated patients staying in remote rural areas have no alternative but to depend on universal +10 D correction. Many patients, who have lost or broken their initial pair of spectacles, remain technically 'blind' after surgery due to poor

access to refraction services. The focometer is a device which can help in such circumstances. It can be handled easily, by un-schooled, minimally-trained personnel. This is evident from the present study. Since it uses natural light, there is no need to depend on the erratic electricity supplies in rural areas.

## Difficulties Experienced

In practical use a few problems were encountered.

1. Old patients were not confident of holding the focometer in their hands. It therefore had to be mounted on a tripod.
2. Sometimes people were scared of rotating the instrument and, in such situations, a paramedic had to slowly rotate the focometer till the patient stated that the best focus was achieved.
3. Though the first time that a patient sees a clear image, he/she should stop rotating the focometer, sometimes patients moved the focometer back and forth. This reduces accuracy. Since aphakic patients do not have the problem of

accommodation, the readings in the present study would not have been affected. This may however create problems in unoperated or younger patients where accommodation may alter the readings.

4. A minor problem encountered was the design of the eyepiece. This is made of rubber and gets distorted and soft in the summer.
5. The major problem is in relation to the cost. At \$250, it becomes a costly option for developing countries, if the focometer is to be widely used by paramedical staff

## The Focometer:

### Practical Advantages

In a population with no other means of refraction, the focometer appeared to be a vast improvement over the existing situation. It can help in integrating refraction services into primary health care services, which would be a sustainable alternative because of the lack of trained optometrists and ophthalmic assistants in most of the developing world.

### Acknowledgement

The authors thank Lacrimedics Inc., USA, for supplying the focometer for use in the present study at a special concessional price.

**Table: Visual Acuity with Presenting Aphakic Correction and Focometer Correction**

| Visual acuity | Unaided vision | Presenting aphakic correction | Focometer refraction |
|---------------|----------------|-------------------------------|----------------------|
|               | N=188          | N=158                         | N=188                |
|               | Per cent       | Per cent                      | Per cent             |
| < 3/60        | 80.8           | 6.3                           | 0.0                  |
| 3/60-< 6/60   | 17.5           | 12.6                          | 0.0                  |
| 6/60-6/36     | 1.6            | 37.4                          | 39.3                 |
| 6/24-6/18     | 0.0            | 39.2                          | 42.5                 |
| >6/18-6/12    | 0.0            | 2.5                           | 11.7                 |
| 6/9-6/6       | 0.0            | 0.6                           | 6.3                  |

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