



THE UNIVERSITY OF  
NEW SOUTH WALES

# A COMPREHENSIVE REFRACTIVE ERROR TRAINING PACKAGE FOR MID- OR LOWER-LEVEL CADRES



ICEE

Jane Kierath<sup>1,2,3</sup>, Sonja Cronjé<sup>1,2,3</sup>, Shoshana Jackofsky<sup>2</sup>, Neilsen De Souza<sup>1,2</sup>, Brien A Holden<sup>1,2,3</sup> and Kovin Naidoo<sup>2</sup>

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## UNCORRECTED REFRACTIVE ERROR

- Single greatest cause of global visual impairment and the second largest cause of avoidable blindness<sup>1,2</sup>
- Cause of 670 million cases of visual impairment
  - 153 million cases of uncorrected distance refractive error<sup>2,3,4</sup>
  - A further 517 million cases of uncorrected near refractive error (presbyopia)<sup>5</sup>
- Interventions to diagnose and manage it are cost-effective and can be delivered by appropriately trained and equipped eye care personnel<sup>2,6,7</sup>
- Major barrier to elimination of the problem in the developing world is the uneven distribution and unavailability of eye care personnel trained to provide refractive error services<sup>6,8</sup>
- Sustainable service provision necessitates the training of appropriate numbers of eye care personnel to work in areas of most need<sup>9</sup>

## ICEE REFRACTIVE ERROR TRAINING PACKAGE

- ICEE education materials have been used to train eye care personnel in more than 30 countries across three continents for almost 10 years
- ICEE recently identified the need for a comprehensive Refractive Error Training Package
- The new ICEE Refractive Error Training Package:
  - is aimed at providing health care workers with the knowledge and skills necessary to
    - perform accurate refractions
    - prescribe and provide appropriate spectacles
  - assumes no previous knowledge of eye care or refraction
  - contains 30 subject units, as outlined in Table 1

Table 1: Subject units for ICEE Refractive Error Training Package

Unit #	Topic	Unit #	Topic
1	Introduction to the Eye	16	Retinoscopy
2	Optics	17	Best Vision Sphere Refraction
3	Eye Optics and Accommodation	18	Sphero-cylindrical Refraction
4	Spherical Lenses	19	Controlling Accommodation
5	Astigmatic Lenses	20	The +1 Test and Binocular Balance
6	Optical Crosses and Transposition	21	Near Refraction for Presbyopia
7	Interpupillary Distance	22	Record Keeping and Referral Letters
8	Trial Sets and Trial Frames	23	Prescribing Spectacles
9	Hand Neutralisation and Vertometry	24	Prescribing Spectacles for Presbyopia
10	Visual Acuity	25	Prescribing Spectacles for Astigmatism
11	Pinhole Visual Acuity	26	Prescribing Readymade Spectacles
12	Hyperopia, Myopia and Astigmatism	27	Adjustment and Care of Spectacles
13	Presbyopia	28	Blindness and Vision Impairment
14	Case History	29	Establishing a Refraction Clinic
15	Introduction to Refraction	30	Managing Stock for Refraction Services

- Each unit consists of:
  - A comprehensive Student Manual
  - A Teacher's Manual with learning activities, discussion topics and simulations for hands on experience
  - A PowerPoint presentation (optional)
  - Student worksheet(s) to facilitate trainee participation and practical exercises
  - Other supporting teaching resources (such as posters) where appropriate
- Units are largely independent – allowing flexibility for different training situations and community needs
- Uncomplicated language is used throughout
  - to accommodate trainees from non-English speaking backgrounds
  - to simplify translation into other languages where needed

## ICEE REFRACTIVE ERROR TRAINING PACKAGE

- Key concepts and procedures are illustrated with:
  - diagrams and pictures
  - flow charts
  - case studies
    - examples of these are shown in Figures 1 to 6

Figure 1: How a person with presbyopia might see without and with spectacles



Presbyopia uncorrected (without spectacles): Near vision blurred. Presbyopia corrected (with spectacles): Near vision clear.

Figure 2: Anatomical terms of location

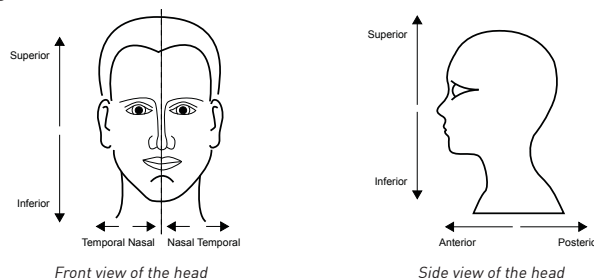


Figure 3: Flow chart for preparation and estimation of the add

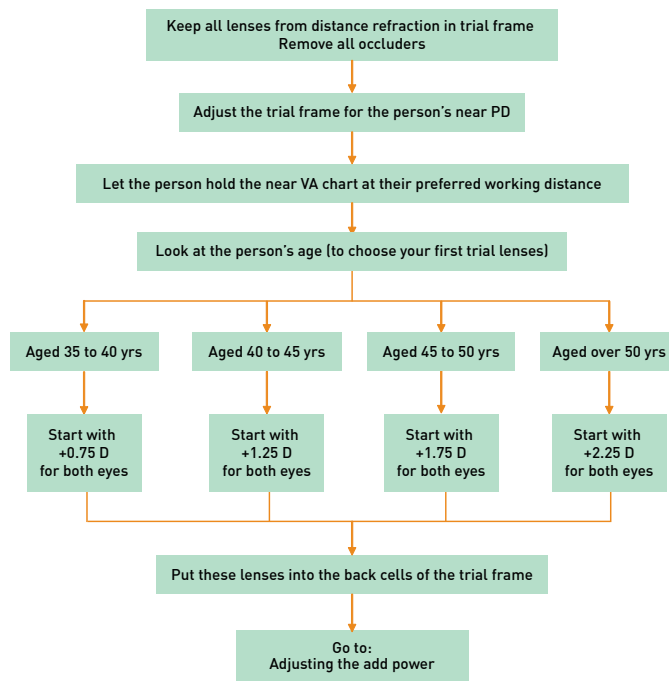


Figure 4: Range of clear vision varies depending on age

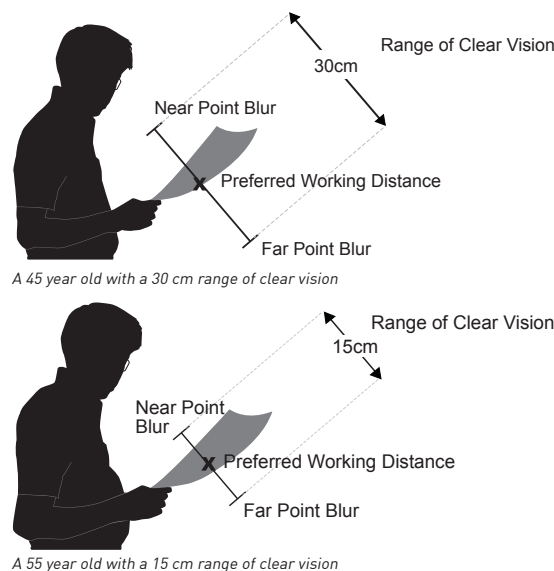


Figure 5: Finding the power of a person's astigmatism

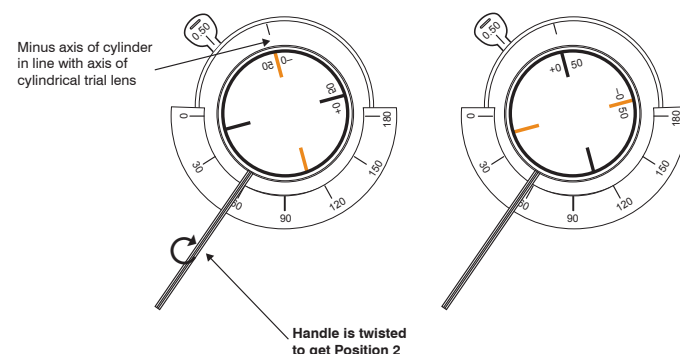
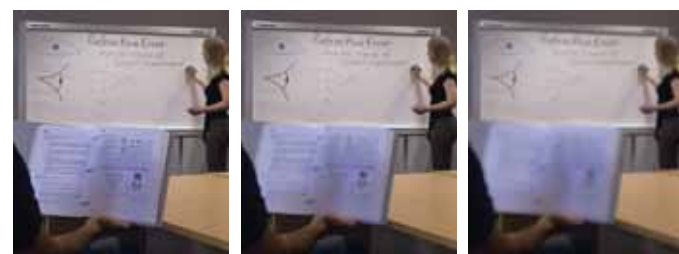


Figure 6: How a person with low, medium and high hyperopia might see



Low hyperopia: May have good distance vision and good near vision, but may have eye strain and headaches. Medium hyperopia: Near vision blurred, but good distance vision. High hyperopia: Both distance and near vision blurred (near vision is worse than distance vision).

- Summary sections reinforce key points:
  - Review section at the start of each unit
    - prior knowledge required for the lesson
  - Summary section at the conclusion of each unit
    - key points learned

## CONCLUSION

- Training mid- and lower-level personnel to diagnose, measure and correct refractive error is essential to the success of VISION 2020
- The new ICEE Refractive Error Training Package provides all the resources necessary to teach a competency-based refraction course in a small group environment
- The new ICEE Refractive Error Training Package is a comprehensive training package for students and teachers of refractive error, and provides a solution to the need for refractive error training resources

## ACKNOWLEDGEMENTS

The Student Manual of the new ICEE Refractive Error Training Package was based on the original ICEE Refraction Manual.

This information was previously presented as a poster at the 8th Annual General Assembly of the International Agency for the Prevention of Blindness (IAPB), Buenos Aires, Argentina, August 2008.

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