Contact Lenses and Corneal Disease

A PROGRAMMED COURSE

ANTONIO R. GASSET, M.D.

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PREFACE

The hallmark of contemporary ophthalmology is the rapidity of its change. Contact lens practice today is quite different from that of yesterday. Sight restoration ends not with surgery, but when the best correctable vision is obtained. Many of the techniques and contact lenses now available were not available in the past: Our predecessors had no choice concerning the use of contact lenses. Today, a choice can be made, and certainly there will be no room in the future for the ophthalmologist who neglects contact lenses as a device for sight restoration. The surgeon who sends his patient to an optical shop for contact lens fitting, unable himself to manage effectively that patient's postoperative care, is not providing the benefit he was contracted for—namely, sight restoration.

Although ophthalmology has frequently been characterized as a surgical speciality, it is far from being simply that. Important as it is, the operative portion is only a small part of the total care a surgical patient needs. It is the excellence of the postoperative care until the time the best possible vision is given the patient that marks a good surgeon. To hear a patient say, "I can see again!" is the greatest reward in our speciality.

The object of this book is not to follow the conventional method of contact lens fitting but to present the new contact lens field in a unique fashion that will allow the reader to use this knowledge immediately in his daily practice. By using the methods presented in this book, he will discover that contact lens fitting is highly rewarding, easily performed, and essential to the practice of ophthalmology. This book will help him to practice immediately what he has learned, and practicing what he has learned, will clarify areas he did not previously understand. This book is a complete and independent treatise; however, the background for this book is based entirely on the author's own experience with contact lenses and corneal diseases.

I owe much to many for their help and teaching, in particular to my former teachers and unfailing counselors, Claes H. Dohlman, Allen Isen, Herbert E. Kaufman, Saiichi Mishima, and Frank Polack. They have been a constant inspiration and encouragement. To them my deepest thanks and gratitude must be recorded formally.

More than the usual amount of credit should go to my secretary, Mrs. Sharon McGuire, who despite the ups and downs of the work never once lost sight of the goal or wavered in her faith or loyalty as typist, editorial assistant, proofreader, and general supporter. She did whatever was needed throughout the many months of preparation of

this book. I must acknowledge the constant help of William Houde and Lucia Lobo in reviewing the manuscript, and the continuing devotion of Takashi Akaboshi in the preparation of the photographs and illustrations for this text. They spared no effort in the pursuit of perfection. Finally, I give my sincere thanks and appreciation for the kindness and courtesy extended to me by the editors and staff of Appleton-Century-Crofts, and in particular to Doreen Berne who, through her unconditional support from the inception, made this volume possible.

Antonio R. Gasset, M.D.

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SECTION 1

Contact Lenses in the Correction of Refractive Errors

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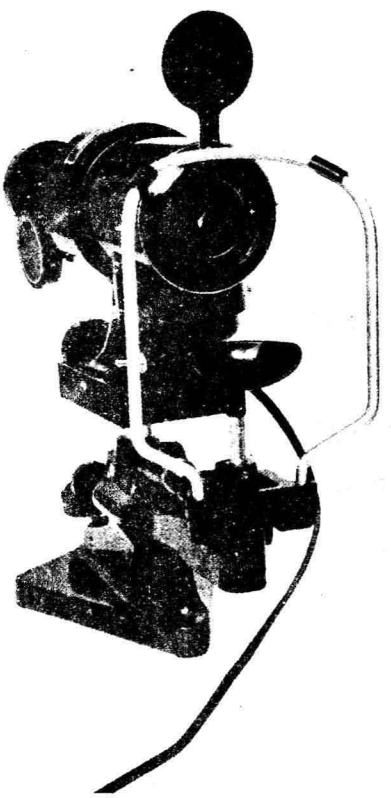
Keratometry

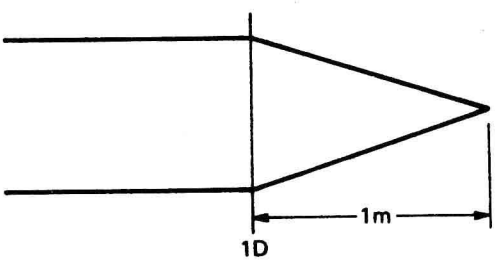
1. THE INSTRUMENTATION



Keratometer. Some terms have gained popularity by general usage such as the term keratometer, even though this is the trade name for the instrument manufactured by Bausch and Lomb. Measurement of corneal curvature is thus better described by the word keratometry, rather than ophthalmometry, and all instruments performing this function are referred to as keratometers.

K Readings. The keratometer measures the curvature of the anterior surface of the cornea in two primary meridians, a vertical and a horizontal meridian separated by 90 degrees. These curvatures are expressed usually in diopters, but may also be expressed in millimeters of radius.

2. The power of a lens is measured in diopters (D). A lens having a power of 1 D will bring parallel rays to focus at a distance of 1 m.



A lens that brings parallel rays to a focus at a distance of 1 m will have a power of _____. 1 D

3. The distance at which a lens causes parallel rays to come to a focus is called the focal length of the lens (f).

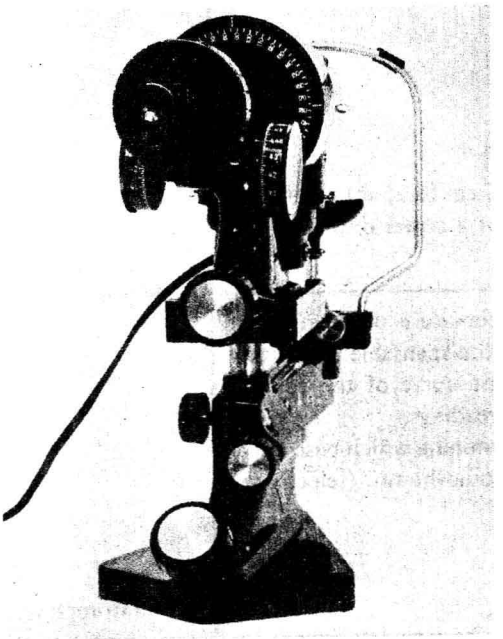
A lens with a power of 1 D will have a focal length of _____. 1 m

4. Dioptric power (D) and focal length (f) are reciprocal to each other; therefore, they may be calculated by the following formula: $D = \frac{1}{f}$ (meters) Reciprocally: $f = \frac{1}{D}$ A lens that has a focal length of 25 cm (0.25 m) will have a power of _____ D; and a lens of a power of 0.50 D will have a focal length of _____ m.	4 2
5. The keratometer measures the curvature of the apex of the cornea. Use of the keratometer is indispensable for fitting any type of contact lenses since the base curve of the contact lens is determined from the keratometer readings. As a rule, the correct way of determining which base curve contact lens to use in a given patient should be on: (select one) 1. fluorescein pattern 2. biomicroscopy 3. trial and error 4. keratometry	4. keratometry
6. There are many different keratometers or ophthalmometers available. Most, if not all, of them are highly reliable and simple. Two of the most commonly used keratometers or ophthalmometers are the Bausch and Lomb Keratometer and the American Optical Ophthalmometer. Match: 1. Bausch and Lomb — a. Keratometer 2. American Optical — b. Ophthalmometer	1. a 2. b
7. The Bausch and Lomb Keratometer measures the dioptrical power or radii of curvature of an area separated by 3.1 mm and the American Ophthalmometer measures an area of cornea of approximately 2.6 mm. The central or apical area of the cornea measured by the Bausch and Lomb Keratometer is (smaller/larger) than the one measured by the American Optical Ophthalmometer.	larger

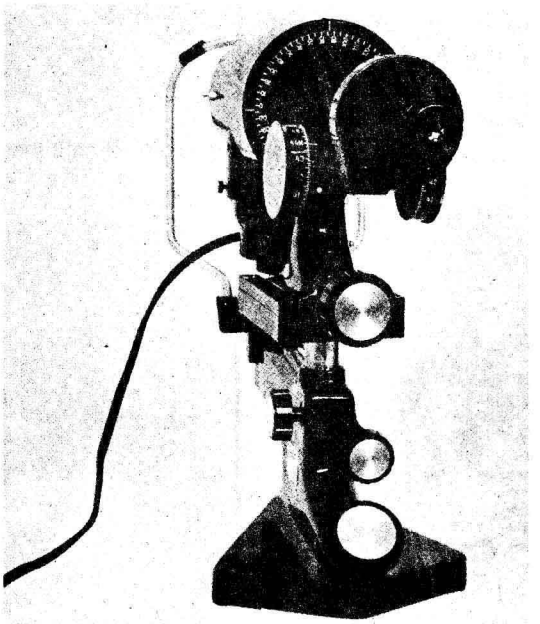
8. The Keratometer or Ophthalmometer measures the power of two corneal meridians 90 degrees apart.

If the vertical meridian is located at 90 degrees, the horizontal meridian will be located at _____.

180 degrees



9. If the vertical meridian is the one located at 86 degrees, the horizontal meridian will be located at _____degrees.



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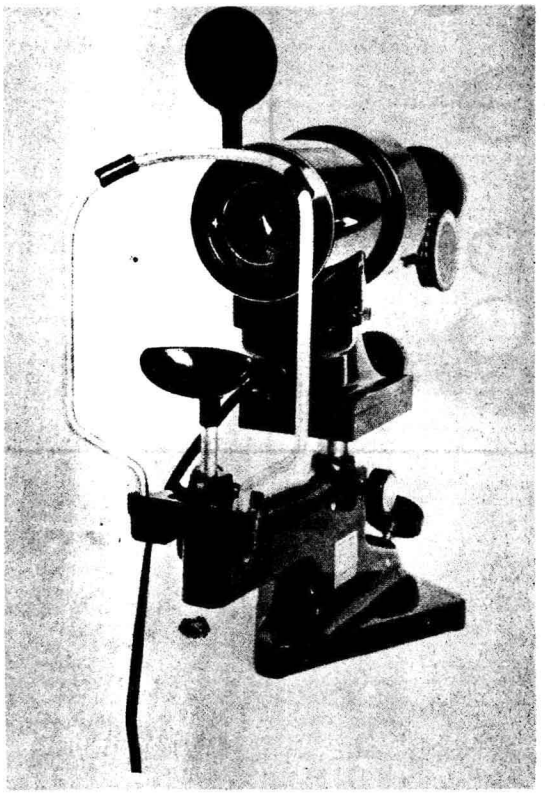
10. The actual power in diopters or millimeters of radii of each meridian is given by the left- and right-hand dial of the instrument.

Conventionally, the left-hand dial determines the horizontal meridian, and the right-hand dial determines the vertical meridian.

The numbers in the right- and left-hand dial determine the power or radii of the meridian in _____.

diopters or millimeters of radius

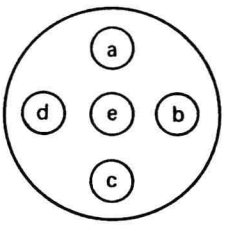


11. Patient positioning and fixation are important to measure the apex of the cornea and to obtain reproducible results.

If the patient looks up, a different area of the cornea will be measured.

Positioning and fixation (are/are not) important.

are

12. The Keratometer or Ophthalmometer measures which area of the cornea? Select one.  	e
13. Occluding the opposite eye helps to allow readings of the central cornea or corneal cap. _____ of the opposite eye is helpful.	Occlusion

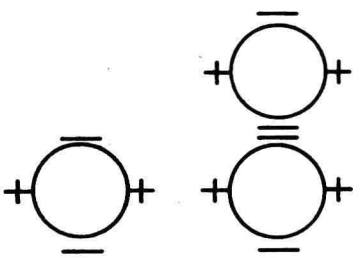
14. With the patient's chin in chinrest and the forehead resting against the headrest, adjust table, chinrest, and headrest for patient's comfort.

The patient's face should be perpendicular to table surface. Make sure forehead is not tilting forward or backward.

Line up instrument on both horizontal and vertical plane with the patient's right eye. Move occluder to cover left eye.

Instruct the patient to look at his own eye on the reflecting surface, or better, at some fixation light (Milton Roy) and adjust instrument up or down and/or left or right as needed.

Operator's view:



Draw what the operator will see through the eye piece at this point.

Operator's view: