

Contents

PART 1: GLAUCOMA—BASICS

1. Glaucoma in Developing Countries	3
<i>R Ramakrishnan</i>	
<i>Background and Current Situations 3 • Glaucoma in Developing Countries 4 • Monitoring Mechanism and Latest Technology 5 • Research Areas 6</i>	
2. Epidemiology of Glaucoma and the Role of Glaucoma Screening in Diagnosis	8
<i>Ronnie George</i>	
<i>Glaucoma Definitions 8 • Risk Factors for POAG 9 • Risk Factors for PACG 10 • Blindness and Glaucoma 11 • Screening for Glaucoma 11 • Sensitivity and Specificity 11 • Predictive Value 12</i>	
3. Natural History of Glaucoma	15
<i>Ronnie George</i>	
<i>Ocular Hypertension Treatment Study (OHTS) 15 • Early Manifest Glaucoma Trial (EMGT) 15 • St Lucia Study 15 • The Vellore Eye Survey 16 • Methods of Assessment of Progression in a Population and Problems Encountered 16 • Primary Angle Closure Disease 16</i>	
4. Genetics of Glaucoma and its Future	18
<i>N Prasanthi, K Rangachari, SR Krishnadas, P Sundaresan</i>	
<i>Basic Genetics 19 • Research Methods to Identify the Candidate Gene 19 • Methodology to Identify Nucleotide Variations in the Candidate Genes 19 • Genetic Loci linked to Glaucoma 19 • Additional Genes Associated with POAG 23 • Genetic Loci Associated with Primary Angle-Closure Glaucoma 23 • Genetic Loci Associated with Exfoliation Glaucoma 24 • Genetic Loci Associated with Anterior Segment Dysgenesis Syndromes 24 • Role of Mitochondrial DNA in Pathogenesis of Glaucoma 25</i>	
5. Pathogenesis of Optic Nerve Head Changes in Glaucoma	31
<i>Joshua Priluck, Deepak P Edward</i>	
<i>Normal Optic Nerve Head Anatomy and Histology 31 • Glaucomatous Neurodegeneration at the Optic Nerve Head 35 • Theories of the Pathogenesis of Glaucoma at the Optic Nerve Head 35 • Changes of Glaucomatous Optic Neuropathy at Optic Nerve Head and their Pathogenesis 36 • Additional Factors in the Pathogenesis of Glaucoma 40</i>	
6. Clinical Trials in Glaucoma	44
<i>Valliammai Muthappan, Alan L Robin, A Jayaprakash Patil, Deepak P Edward</i>	
<i>Overview of Major Glaucoma Clinical Trials 44 • Collaborative Initial Glaucoma Treatment Study 44 • Early Manifest Glaucoma Trial 45 • Ocular Hypertension Treatment Study 46 • Advanced Glaucoma Intervention Study (AGIS) 47 • Collaborative Normal Tension Glaucoma Study 49 • What have We Learnt from the Clinical Trials in Glaucoma? 53 • Evidence Based Medicine 53 • Clinical Trials in Glaucoma 53 • Ocular Hypertension Treatment Study (OHTS) 53 • The European Glaucoma Prevention Study (EGPS) 56 • Early Manifest Glaucoma Trial (EMGT) 57 • Glaucoma Laser</i>	

Trial (GLT) and Glaucoma Laser Trial Follow-up Study (GLTFS) 58 • Advanced Glaucoma Intervention Study (AGIS) 59 • Fluorouracil Filtration Surgery Study (FFSS) 60 • Collaborative Initial Glaucoma Treatment Study (CIGTS) 61 • Collaborative Normal Tension Glaucoma Study (CNTGS) 62

7. Prevalence of Glaucoma in India and the World

65

SR Krishnadas

*Regional Variations in the Prevalence of Glaucoma 65 • Prevalence of Glaucoma in India 66
• Glaucoma Blindness in India 68*

8. Vascular Factors in Glaucoma

70

Tanuj Dada, Shalini Mohan, Munish Dhawan

Blood Supply of the Optic Nerve Head 70 • Factors Influencing Blood Flow in ONH 71 • Evaluation of the ONH Circulation 72 • Role of Ocular Blood Flow in Patients having Obstructive Sleep Apnea Syndrome and Glaucoma 73 • Clinical Significance of Ocular Perfusion Pressure in the Diagnosis and Management of Glaucoma 73

9. Aqueous Humor Dynamics

76

Shalmali Ranaut, Mona Khurana, R Ramakrishnan

Functions of Aqueous Humor 76 • Aqueous Humor Dynamics 76 • Aqueous Humor: Pathway of Circulation 77 • Composition of Aqueous Humor 78 • Aqueous Humor Formation and Secretion 81 • Factors Affecting Aqueous Humor Production 84 • Aqueous Humor Drainage 84 • Measurement of Aqueous Humor Outflow and Facility of Outflow 87 • Factors Affecting Aqueous Humor Outflow 90

10. When and How does Glaucoma Produce Visual Disability?

92

Pradeep Ramulu

Importance of Relating Glaucomatous Damage to Disability 92 • Asking the Right Questions in Glaucoma and Disability 93 • Glaucoma and Disability—A Question of “When” not “If”? 93 • Staging Glaucoma for Purpose of Disability 94 • Glaucoma and Disability: Which Tasks and Functions are Affected? 94 • Understanding When Disability is Present 95 • Disability—Importance of Lighting Conditions 100 • Glaucoma—Other Effects 100

PART 2: GLAUCOMA—DIAGNOSTICS

11. History-taking

107

Arijit Mitra, R Ramakrishnan

*Goals of History 107 • Symptoms 108 • Past Ocular History 109 • Ocular Medications 109
• Systemic Disease 109 • Allergies 110 • Lifestyle and Daily Activities 110 • Socioeconomic History 110 • Family History 110*

12. Tonometry

111

Mani Bhaskaran

Tonometry Basics and Newer Techniques 111 • Types of Tonometers 111 • Indentation Tonometers 112 • Applanation Tonometers 112 • Noncontact Tonometer 115 • Continuous IOP Monitoring Devices 116 • Home Tonometry 116 • Comparison, Calibration and Sterilization of Different Tonometers 116 • Calibration of GAT 117 • Recent Advancements in Tonometry—Merits and Demerits 120 • Tonometers with Relevant Modifications 120 • Implantable IOP Sensors (Under Development) 125

13. Gonioscopy	127
<i>Gus Gazzard, Arun Rajan, Paul Foster, Keith Barton</i>	
<i>Definition 127 • History of Gonioscopy 127 • Optical Principles 127 • Cleaning of Diagnostic Contact Lenses 128 • Technique of Gonioscopic Examination 129 • Gonioscopic Anatomy 132 • Fosters' Questions for Gonioscopy 135 • Other Uses of Gonioscopy 136 • Cycloscopy 139</i>	
14. Central Corneal Thickness and its Relevance in Glaucoma Diagnosis and Management	140
<i>Manish Shah</i>	
<i>Estimation of True IOP from Goldmann Applanation Tonometer Readings 140 • Is CCT an independent Risk Factor to Predict Glaucoma Progression? 141</i>	
15. Back to Basics: Structural Changes in Glaucoma and Clinical Evaluation of the Optic Nerve Head	142
<i>R Ramakrishnan, Mona Khurana</i>	
<i>Optic Nerve Head Evaluation Techniques 142 • Normal Optic Nerve Head 143 • Normal ONH Morphology 147 • Glaucomatous Optic Nerve Head 152 • Summary of Some Commonly Used Disc Evaluation Terms 164 • Glaucomatous or Nonglaucomatous 165 • How to Document the Appearance of the Disc? 169</i>	
16. Interpretation of Visual Fields	181
<i>GR Reddy</i>	
<i>Measurements of Visual Fields 181 • Understanding a Single Field Printout 185 • Single Field Analysis Printout 194 • Anderson's Criteria 195 • Overview Printout 196 • Change Analysis Printout 197 • Glaucoma Progression Analysis 205</i>	
17. Octopus Perimetry: A Synopsis	219
<i>NR Rangaraj, Murali Ariga</i>	
<i>Visual Field Evaluation 219 • Basic Definitions 221 • Measurement Strategies 222 • Octopus Examination Programs 225 • Systematic Interpretation of Octopus Seven in One Single Field Report, 'The Ten Step Approach' 227 • Octopus Perimeter Reports 233</i>	
18. Progression Analysis of Glaucoma with Octopus Perimetry	238
<i>NR Rangaraj</i>	
<i>Barriers to Follow-up 238 • Measurement of Visual Field Progression 239 • Display of Data in the EyeSuite™ 243 • Examples to Highlight Concepts of EyeSuite™ Software 245 • Components of the EyeSuite™ Printout 245 • Global Trend Printout 246 • Cluster Analysis 247 • Polar Trend 247 • Summary of the Printouts 247 • Typical Examples of EyeSuite™ Printout with Interpretation 248</i>	
19. Ultrasound Biomicroscopy in Glaucoma	254
<i>Aditya Neog, L Vijaya</i>	
<i>Technique of Examination 254 • Ultrasound Biomicroscopy in Normal Eye 255 • Ultrasound Biomicroscopy in Glaucoma 255 • Other Conditions in which Ultrasound Biomicroscopy may be Helpful 257 • Quantitative Measurements 257 • Future Trends 259</i>	
20. Confocal Laser Scanning Tomography: Principles and Clinical Utility	261
<i>Vinay Nangia</i>	
<i>Confocal Scanning Laser Tomography 261 • Principles and Clinical Utility 263 • Clinical Cases 264 • Clinical Implications and Conclusion 264</i>	

21. Imaging in Glaucoma	272
<i>Arijit Mitra, R Ramakrishnan</i>	
<i>Anterior Segment Optical Coherence Tomography 272 • Principle of Optical Coherence Tomography 272 • ASOCT in Glaucoma 274 • Comparison of Anterior Segment Optical Coherence Tomography Versus Ultrasound Biomicroscopy 276 • Scanning Laser Polarimetry 278 • Principle 278 • Birefringence of the Other Ocular Structures—Anterior Segment Birefringence 278 • Variable Corneal Compensation 278 • Enhanced Corneal Compensation 278 • Clinical Interpretation of the GDx Variable Corneal Compensation Printout 279 • Serial Analysis 282 • Optical Coherence Tomography in Glaucoma 286 • Basic Principles of Optical Coherence Tomography 286</i>	
PART 3: GLAUCOMA—CLINICAL	
22. Classification of Glaucoma	291
<i>Sandeep Bachu, R Ramakrishnan</i>	
<i>Primary and Secondary 291 • Classification Based on Etiology or the Initial Event 291 • Classification Based on Mechanism of Outflow Obstruction 291 • Classification of Angle Closure Glaucoma 293 • Classification of Open Angle Glaucoma 293 • Developmental Anomalies of Anterior Chamber Angle 294 • Epidemiological Classification of Glaucoma 294</i>	
23. Ocular Hypertension	296
<i>Manju Pillai</i>	
<i>What is Ocular Hypertension? 296 • Epidemiology 296 • Assessment and Follow-up 296 • Baseline Risk Factors that Predict the Conversion to Primary Open Angle Glaucoma 297 • Management of OHT 298 • Guidelines on Treatment 298 • Ocular Hypertension Treatment Study 298</i>	
24. Primary Open Angle Glaucoma	301
<i>SR Krishnadas</i>	
<i>Epidemiology 301 • Risk Factors 302 • Clinical Features 304 • Differential Diagnosis 305 • Pathology and Pathophysiology 306 • Treatment 307 • Course and Prognosis/Outcome of Primary Open Angle Glaucoma 311</i>	
25. Normal Tension Glaucoma	315
<i>Kundan Karan, George V Puthuran</i>	
<i>Difference between Primary Open Angle Glaucoma and Normal Tension Glaucoma 316 • Possible Mechanism of Normal Tension Glaucoma 316 • Differential Diagnosis: Tension Glaucoma 317 • Treatment 318 • Recent Findings 318</i>	
26. Angle-Closure Glaucoma	321
<i>Ronald SH Chung, Shamira A Perera, Tin Aung</i>	
<i>Terminology and Definitions 321 • Etiology 321 • Patient Assessment 323 • Pathophysiology 324 • Management of Angle-Closure Glaucoma 325 • Acute Primary Angle-Closure 327</i>	
27. Unilateral Glaucoma	332
<i>Devendra Maheshwari, R Ramakrishnan</i>	
<i>Unilateral Angle Closure Glaucomas 332 • Unilateral Secondary Open Angle Glaucomas 334</i>	

28. Exfoliation Syndrome and Exfoliation Glaucoma	337
<i>Mona Khurana, R Ramakrishnan</i>	
<i>Epidemiology 338 • Etiology and Pathogenesis 339 • Pathogenesis of Glaucoma 344</i>	
<i>• Clinical Features 345 • Differential Diagnosis 352 • Management 352 • Recent Advances 357 • Unanswered Questions 357</i>	
29. Pigment Dispersion Syndrome and Pigmentary Glaucoma	362
<i>Mona Khurana, Manju Pillai, R Ramakrishnan</i>	
<i>History 362 • Epidemiology and Genetics 362 • Atypical Presentations 363 • Clinical Features 363</i>	
<i>• Natural History 365 • Pathophysiology 366 • Differential Diagnosis 368 • Medical Management 371</i>	
<i>• Laser Trabeculoplasty 371 • Surgical Management 372</i>	
30. Lens-induced Glaucoma	376
<i>R Venkatesh, Kavitha Palanisamy</i>	
<i>Classification 376 • Phacomorphic Glaucoma 376 • Phacolytic Glaucoma 378 • Glaucoma Associated with Ectopia Lentis 379 • Lens Particle Glaucoma 380 • Phacoanaphylaxis 381</i>	
31. Glaucoma in Aphakia and Pseudophakia	383
<i>Sandhya Reddy, Venkat Reddy, R Ramakrishnan</i>	
<i>Pathogenesis of Glaucoma 383 • Clinical Conditions 384 • Management 386</i>	
32. Uveitic Glaucoma	389
<i>SR Rathinam</i>	
<i>Prevalence of Uveitic Glaucoma 389 • Mechanism of Intraocular Pressure Variation in the Course of Uveitis 389 • Clinical Work-up in Uveitic Glaucoma 392 • Management of Elevated IOP on Patients with Uveitis 393</i>	
33. Neovascular Glaucoma	396
<i>Nidhi Gupta, SR Krishnadas</i>	
<i>Pathogenesis 396 • Conditions Commonly Associated with Neovascular Glaucoma 396 • Stages of Neovascular Glaucoma 398 • Clinical Features 398 • Differential Diagnosis 399 • Management 399</i>	
<i>• Future Therapeutic Options 401</i>	
34. Ocular Trauma and Glaucoma	404
<i>Mohan Kumar, R Ramakrishnan</i>	
<i>Mechanism of Glaucoma Following Ocular Trauma 404 • Pathogenesis of Traumatic Glaucoma 405</i>	
<i>• Clinical Findings 405 • Management 409</i>	
35. Steroid-induced Glaucoma	411
<i>Ankit Gupta, R Ramakrishnan</i>	
<i>Steroid Responders and their Corticosteroid Sensitivity 411 • Routes of Administration and Pressure Response 412 • Clinical Presentation 412 • Mechanism of Glaucoma 412</i>	
<i>• Prevention 413 • Management 413</i>	
36. Glaucoma Associated with Penetrating Keratoplasty	417
<i>Oswald Rondón</i>	
<i>The Challenge 417 • Epidemiology 417 • Risk Factors 417 • Mechanism of Glaucoma 417 • Medical Management 418 • Surgical Management 418</i>	

- 37. Glaucoma in Corneal Disorders** 420
Ashish Bacchav, R Ramakrishnan
Iridocorneal Endothelial Syndrome 420 • *Posterior Polymorphous Dystrophy* 422 • *Fuchs Endothelial Dystrophy* 422 • *Peters Anomaly* 423 • *Axenfeld Rieger Syndrome* 423
- 38. Glaucoma Associated with Intraocular Tumors** 427
Ashish Kumar, R Ramakrishnan
Tumors of the Uveal Tract 427 • *Benign Tumors of the Anterior Uvea* 429
 • *Systemic Malignancies* 430 • *Ocular Tumors of Childhood* 430 • *Phacomatosis* 431
 • *Management of Tumor Induced Glaucoma* 433
- 39. Developmental Glaucoma—An Overview** 437
Anil Kumar Mandal, Debasis Chakrabarti, Raka (Chatterjee) Chakrabarti
Clinical Features 437 • *Differential Diagnosis* 438 • *Work-up* 438 • *Treatment* 439 • *Follow-up* 439
 • *Secondary Congenital Glaucomas* 439
- 40. Primary Congenital Glaucoma—Pathogenesis, Clinical Features, Diagnosis, Differential Diagnosis and Management** 442
Anil Kumar Mandal, Debasis Chakrabarti, Raka (Chatterjee) Chakrabarti
Pathology and Pathogenesis 442 • *Clinical Presentation* 443 • *Factors Influencing Therapeutic Decisions* 444
 • *Therapy* 445 • *Follow-up* 449 • *Role of Genetic Study and Genetic Counseling* 450
- 41. Glaucoma in Phacomatosis** 453
Kavitha Palanisamy, R Venkatesh
Sturge-Weber Syndrome 453 • *Von Recklinghausen's Neurofibromatosis (NF1)* 455 • *Von Hippel-Lindau Disease (Angiomatosis Retinae)* 458 • *Tuberous Sclerosis* 459 • *Nevus of OTA* 460 • *Phakomatosis Pigmentovascularis* 461 • *Cutis Marmorata Telangiectatica Congenital* 461

PART 4: GLAUCOMA—THERAPEUTICS

- 42. Medical Management of Glaucoma** 465
Ankit Gupta, Mona Khurana, R Ramakrishnan
The Need for Treatment 465 • *Setting a Target Pressure* 466 • *Initiating Treatment* 467 • *Systemic Medication and Systemic Status* 468 • *Educating the Patient* 468 • *Adherence and Persistence* 469
 • *General Pharmacologic Principles* 470 • *Parasympathomimetic Agents* 472 • β -Adrenergic Receptor Antagonists 478 • *Classification* 478 • *Mechanism of Action of Beta Blockers* 478 • *Drugs in Clinical Use* 479 • *Drug Interactions* 481 • *Side Effects* 482 • *Adrenergic Agonists* 485 • *Non-selective (Alpha and Beta) Agonists* 485 • *Selective Alpha Adrenergic Agonists* 486 • *Clonidine* 487 • *Apraclonidine* 487 • *Brimonidine* 487 • *Prostaglandins Analogues* 492 • *Pharmacology* 492 • *Mechanism of Action* 492
 • *Latanoprost* 493 • *Unoprostone* 493 • *Travoprost* 493 • *Bimatoprost* 494 • *Tafluprost* 494
 • *Overview of IOP Lowering Effect* 495 • *Side Effects* 495 • *Carbonic Anhydrase Inhibitors* 500
 • *Mechanism of Action* 500 • *Systemic Carbonic Anhydrase Inhibitors* 500 • *Topical Carbonic Anhydrase Inhibitors* 502 • *Side Effects of Topical CAIs* 503 • *Hyperosmotic Agents* 506 • *Oral Hyperosmotic Agents* 507 • *Intravenous Hyperosmotic Agents* 507 • *Side Effects of Hyperosmotic Agents* 507
 • *Fixed Combinations* 510

43. Laser Trabeculoplasty	512
<i>Matthew C Willett, Todd E Woodruff, Deepak P Edward</i>	
<i>Argon Laser Trabeculoplasty 512 • Mechanism of Action 512 • Indications 513 • Contraindications 514 • Technique 514 • Complications 520 • Selective Laser Trabeculoplasty 522 • Technique 523 • Efficacy 524 • Effect of Patient Characteristics 524 • Retreatment 525 • Complications 525 • Comparing Argon Laser Trabeculoplasty to Selective Laser Trabeculoplasty 526 • Diode Laser Trabeculoplasty 527</i>	
44. Laser Iridotomy and Other Laser Procedures	531
<i>R Ramakrishnan</i>	
<i>Laser Procedures in Glaucoma 531 • Laser Iridotomy 531 • Peripheral Iridoplasty 533 • Laser Suture Lysis 534</i>	
45. History of Filtering Surgeries: Past, Present and Future	536
<i>R Ramakrishnan</i>	
<i>Early Procedures 536 • Full Thickness Filtration Surgeries 537 • Partial Thickness Filtering Procedures 538 • Antifibrotic Agents 539 • Glaucoma Drainage Devices 539 • Nonpenetrating Glaucoma Surgeries 540 • New Procedures 541</i>	
46. Wound Healing in Glaucoma Surgery and Role of Antimetabolites in Glaucoma Filtering Surgery	543
<i>Nikhil S Choudhari, L Vijaya</i>	
<i>Wound Healing in Glaucoma Surgery 543 • Failure of Glaucoma Filtering Surgery 543 • Antimetabolites and Glaucoma Filtering Surgery 544 • Developments in the Usage of Antimetabolites in Glaucoma Filtering Surgery 545 • Technique of Application of Antimetabolites 545 • Complications of Antimetabolite Use 547 • Recent Advances 547</i>	
47. Trabeculectomy—Surgical Techniques and Complications	550
<i>P Sathyan, MS Sunil, R Ramakrishnan</i>	
<i>Objectives of Glaucoma Surgery 550 • Principle of Glaucoma Surgery 550 • Preoperative Considerations 550 • Anesthesia 552 • Trabeculectomy: Surgical Technique 552 • Special Considerations 559 • Early Bleb Titration 560 • Complications of Glaucoma Filtering Surgery 561 • Management of the Leaking Bleb: An Overview 572</i>	
48. Collagen Implants in Glaucoma Filtering Surgery	574
<i>Ashish Kumar, R Ramakrishnan</i>	
<i>Composition and Safety 574 • Mechanism of Action 574 • Efficacy 575 • Indications 575 • Technique 575 • Postoperative Course and Appearance of the Bleb 575</i>	
49. Dysfunctional Filtering Blebs	577
<i>Anup Das, Mohideen Abdul Kader</i>	
<i>Features of Filtering Blebs 577 • An Overview of Factors Affecting Gross Morphology and Function of a Filtering Bleb 578 • Dysfunctional Bleb and Related Problems 578 • The Overfiltering Bleb and Hypotony 578 • Bleb Leak 579 • Failing and Failed Blebs 580 • Bleb Encapsulation 580 • Symptomatic Bleb/Bleb Dysesthesia 581 • Blebitis and Endophthalmitis 581</i>	
50. Cataract and Glaucoma	583
<i>Amy Parminder, Timothea Ryan, Bradford Shingleton</i>	
<i>Cataract Assessment 583 • Glaucoma Assessment 583 • Surgical Management 584 • Techniques for Combined Surgery 587 • History and New Frontiers 592</i>	

- 51. Managing Cataract and Glaucoma in Developing World—Manual Small Incision Cataract Surgery Combined with Trabeculectomy (MSICS-Trab)** **595**
R Venkatesh, R Ramakrishnan
Why Combined Surgery? 595 • *Combined Surgery* 596 • *Surgical Technique for MSICS Combined with Trabeculectomy (MSICS-Trab)* 596 • *Postoperative Protocol* 600
- 52. Glaucoma Drainage Devices** **602**
Mona Khurana, R Ramakrishnan
History 602 • *Types of Glaucoma Drainage Devices (GDDs)* 603 • *Mechanism of Action* 603 • *Indications of GDDs* 603 • *Implant Designs* 603 • *Nonvalved Implants* 604 • *Valved/Restrictive Implants* 605 • *Other GDDs* 606 • *Surgical Technique* 608 • *Special Situations* 610 • *Complications* 611 • *Success* 614
- 53. From Deep Sclerectomy to Canaloplasty Re-establish the Natural Outflow in Patients with Chronic Open-Angle Glaucoma** **617**
Gabor B Scharioth
Magnitude of Glaucoma 617 • *Types of Glaucoma* 617 • *Risk Factors* 617 • *Antiglaucoma Surgery* 618 • *Nonpenetrating Filtering Surgery* 618 • *Postoperative Follow-up* 623 • *Complications of Nonpenetrating Glaucoma Surgery* 623 • *Early Postoperative Complications* 624 • *Late Postoperative Complications* 624
- 54. Cyclodestructive Procedure** **628**
R Ramakrishnan
Indications 628 • *Contraindications* 628 • *Cyclocryotherapy* 628 • *Ultrasound* 629 • *Laser Cycloablation* 629 • *Endocyclophotocoagulation* 630 • *Complications of Cyclodestructive Procedures* 630

PART 5: GLAUCOMA—FUTURE

- 55. Neuroprotection in Glaucoma** **633**
Suresh Puthalath, R Ramakrishnan
Current Concepts in Neuroprotection 633 • *What is Neuroprotection?* 633 • *Apoptosis* 635 • *Current Approaches in Neuroprotective Intervention* 635 • *Potential Neuroprotective Compounds for Glaucoma Therapy* 635 • *Where are We Today?* 636 • *Future Trends* 637
- 56. Medical Management of Glaucoma—The Future** **638**
R Ramakrishnan
Prostaglandin Analogues 638 • *Preservatives and Antiglaucoma Drugs* 638 • *Rho-Kinase (ROCK) Inhibitors* 638 • *Steroids Different Approaches* 639 • *Neuroprotection in Glaucoma* 639 • *Anti-VEGF* 639 • *Other Agents in Clinical Development* 639 • *Drug Delivery Systems* 639 • *Future of Nanomedicine in Vision Research* 639 • *Gene Therapy in Glaucoma* 639

Index **641**