

<b>PREFACE</b>	<b>xi</b>
<b>CONTRIBUTORS</b>	<b>xxvii</b>
<b>PART I THE SCIENCE OF SLEEP MEDICINE</b>	<b>1</b>
<b>1 Normal Human Sleep</b>	<b>3</b>
<i>Anil Natesan Rama, S. Charles Cho, and Clete A. Kushida</i>	
<b>2 The Neurobiology of Sleep</b>	<b>11</b>
<i>Gerald A. Marks</i>	
<b>3 Physiologic Processes During Sleep</b>	<b>19</b>
<i>Leon Rosenthal</i>	
<b>4 Biological Rhythms and Sleep</b>	<b>25</b>
<i>Robert Y. Moore</i>	
<b>5 Biology of Dreaming</b>	<b>31</b>
<i>Milton Kramer</i>	
<b>6 Psychology of Dreaming</b>	<b>37</b>
<i>Milton Kramer</i>	
<b>7 The Function of Sleep</b>	<b>45</b>
<i>Marcos G. Frank</i>	
<b>8 The Evolution of Sleep: A Phylogenetic Approach</b>	<b>49</b>
<i>John A. Lesku, Niels C. Rattenborg, and Charles J. Amlaner, Jr.</i>	
<b>9 Neuropharmacology of Sleep and Wakefulness</b>	<b>63</b>
<i>Edgar Garcia-Rill, Tiffany Wallace, and Cameron Good</i>	

<b>10</b>	<b>Epidemiology of Sleep Disorders</b>	<b>73</b>
	<i>Maurice M. Ohayon and Christian Guilleminault</i>	
<b>11</b>	<b>Classification of Sleep Disorders</b>	<b>83</b>
	<i>Andrew L. Chesson, Jr.</i>	
<b>PART II INSOMNIA</b>		<b>91</b>
<b>12</b>	<b>Insomnia: Prevalence and Daytime Consequences</b>	<b>93</b>
	<i>W. David Brown</i>	
<b>13</b>	<b>Causes of Insomnia</b>	<b>99</b>
	<i>Edward J. Stepanski</i>	
<b>14</b>	<b>Medications that Can Cause Insomnia</b>	<b>103</b>
	<i>Carolyn H. Welsh and Randolph V. Fugit</i>	
<b>15</b>	<b>Fatal Familial Insomnia</b>	<b>111</b>
	<i>Charles A. Polnitsky</i>	
<b>16</b>	<b>Evaluation of Insomnia</b>	<b>117</b>
	<i>Douglas E. Moul and Daniel J. Buysse</i>	
<b>17</b>	<b>Pharmacologic Therapy of Insomnia</b>	<b>125</b>
	<i>Teofilo Lee-Chiong and Michael Sateia</i>	
<b>18</b>	<b>Nonpharmacologic Therapy of Insomnia</b>	<b>133</b>
	<i>Melanie K. Means and Jack D. Edinger</i>	
<b>PART III EXCESSIVE SLEEPINESS</b>		<b>137</b>
<b>19</b>	<b>Sleep Deprivation and Its Effects on Cognitive Performance</b>	<b>139</b>
	<i>Jillian Dorrian and David F. Dinges</i>	

<b>20</b>	<b>Narcolepsy</b>	<b>145</b>
	<i>Rafael Pelayo and Maria Cecilia Lopes</i>	
<b>21</b>	<b>Idiopathic Hypersomnia</b>	<b>151</b>
	<i>Stephen N. Brooks</i>	
<b>22</b>	<b>Post-traumatic and Recurrent Hypersomnia</b>	<b>157</b>
	<i>Carolyn M. D'Ambrosio and Joshua Baron</i>	
<b>23</b>	<b>Sleeping Sickness</b>	<b>163</b>
	<i>Alain Buguet, Florian Chapotot, Raymond Cespuglio, Sylvie Bisser, and Bernard Bouteille</i>	
<b>24</b>	<b>Medications that Induce Sleepiness</b>	<b>175</b>
	<i>J. F. Pagel</i>	
<b>25</b>	<b>Evaluation of Excessive Sleepiness</b>	<b>183</b>
	<i>Merrill S. Wise</i>	
<b>26</b>	<b>Therapy for Excessive Sleepiness</b>	<b>191</b>
	<i>Max Hirshkowitz</i>	
<b>27</b>	<b>Napping</b>	<b>197</b>
	<i>Masaya Takahashi and Kosuke Kaida</i>	
<b>28</b>	<b>Sleep Loss, Sleepiness, Performance, and Safety</b>	<b>203</b>
	<i>Roger R. Rosa</i>	
<b>PART IV SLEEP DISORDERED BREATHING SYNDROMES</b>		<b>209</b>
<b>29</b>	<b>Physiology of Sleep Disordered Breathing</b>	<b>211</b>
	<i>B. Tucker Woodson</i>	
<b>30</b>	<b>Snoring</b>	<b>223</b>
	<i>Eric J. Olson and John G. Park</i>	
<b>31</b>	<b>Overview of Obstructive Sleep Apnea in Adults</b>	<b>231</b>
	<i>Mark H. Sanders and Rachel J. Givelber</i>	
<b>32</b>	<b>Upper Airway Resistance Syndrome</b>	<b>241</b>
	<i>Robert D. Ballard</i>	
<b>33</b>	<b>Central Sleep Apnea</b>	<b>249</b>
	<i>S. Javaheri</i>	
<b>34</b>	<b>Obesity Hypoventilation Syndrome</b>	<b>263</b>
	<i>John G. Park</i>	
<b>35</b>	<b>Cardiovascular Complications of Obstructive Sleep Apnea</b>	<b>267</b>
	<i>Peter Y. Hahn, Lyle J. Olson, and Virend K. Somers</i>	

<b>36</b>	<b>Pulmonary Hypertension and Sleep Disordered Breathing</b>	<b>275</b>
	<i>Brooke G. Judd</i>	
<b>37</b>	<b>Neurocognitive and Functional Impairment in Obstructive Sleep Apnea</b>	<b>279</b>
	<i>W. David Brown</i>	
<b>38</b>	<b>Sleep Apnea and Cerebrovascular Disease</b>	<b>287</b>
	<i>Vahid Mohsenin and Henry Yaggi</i>	
<b>39</b>	<b>Radiographic and Endoscopic Evaluation of the Upper Airway</b>	<b>293</b>
	<i>Richard J. Schwab and Neil S. Kline</i>	
<b>40</b>	<b>Evaluation of Sleep Disordered Breathing: Polysomnography</b>	<b>303</b>
	<i>Reena Mehra and Kingman P. Strohl</i>	
<b>41</b>	<b>Evaluation of Sleep Disordered Breathing 2: Portable Sleep Monitoring</b>	<b>317</b>
	<i>Michael R. Littner</i>	
<b>42</b>	<b>Indications for Treatment of Obstructive Sleep Apnea in Adults</b>	<b>331</b>
	<i>Nilesh B. Davé and Patrick J. Strollo</i>	
<b>43</b>	<b>Medical Treatment of Obstructive Sleep Apnea: Life-Style Changes, Weight Reduction, and Postural Therapy</b>	<b>337</b>
	<i>Sheldon Kapen</i>	
<b>44</b>	<b>Pharmacological Treatment of Sleep Disordered Breathing</b>	<b>347</b>
	<i>David W. Hudgel</i>	
<b>45</b>	<b>Positive Airway Pressure Therapy for Obstructive Sleep Apnea</b>	<b>355</b>
	<i>Max Hirshkowitz and Teofilo Lee-Chiong</i>	
<b>46</b>	<b>Upper Airway Surgery for Obstructive Sleep Apnea</b>	<b>365</b>
	<i>Aaron E. Sher</i>	
<b>47</b>	<b>Oral Devices Therapy for Obstructive Sleep Apnea</b>	<b>373</b>
	<i>Dennis R. Bailey</i>	
<b>PART V CIRCADIAN RHYTHM SLEEP DISORDERS</b>		<b>381</b>
<b>48</b>	<b>Advanced, Delayed, Irregular, and Free-Running Sleep–Wake Disorders</b>	<b>383</b>
	<i>Yaron Dagan, Katy Borodkin, and Liat Ayalon</i>	
<b>49</b>	<b>Jet Lag</b>	<b>389</b>
	<i>Timothy H. Monk</i>	

<b>50</b>	<b>Shift Work Sleep Disorder</b>	<b>395</b>
	<i>Gary S. Richardson</i>	
<b>51</b>	<b>Neurological and Medical Disorders Associated with Circadian Rhythm Disturbances</b>	<b>401</b>
	<i>Ramadevi Gourineni and Phyllis C. Zee</i>	
<b>52</b>	<b>Psychiatric Disorders Associated with Circadian Rhythm Disturbances</b>	<b>409</b>
	<i>Stephany Jones and Ruth M. Benca</i>	
<b>53</b>	<b>Therapy of Circadian Sleep Disorders</b>	<b>415</b>
	<i>Robert Sack and Kyle Johnson</i>	
<b>PART VI PARASOMNIAS</b>		<b>423</b>
<b>54</b>	<b>Disorders of Arousal and Sleep-Related Movement Disorders</b>	<b>425</b>
	<i>Keith Cavanaugh and Norman R. Friedman</i>	
<b>55</b>	<b>Sleepwalking</b>	<b>429</b>
	<i>Rosalind D. Cartwright</i>	
<b>56</b>	<b>REM Sleep Behavior Disorder and REM-Related Parasomnias</b>	<b>435</b>
	<i>Maja Tippmann-Peikert, Timothy I. Morgenthaler, Bradley F. Boeve, and Michael H. Silber</i>	
<b>57</b>	<b>Nocturnal Enuresis in Children</b>	<b>443</b>
	<i>Marie-Josèphe Challamel and Pierre Cochat</i>	
<b>58</b>	<b>Sleep Bruxism</b>	<b>449</b>
	<i>Gaby Bader</i>	
<b>59</b>	<b>Sleep-Related Eating Disorders</b>	<b>457</b>
	<i>R. Robert Auger and Timothy I. Morgenthaler</i>	
<b>60</b>	<b>Other Parasomnias</b>	<b>463</b>
	<i>Asher Qureshi</i>	
<b>PART VII MOVEMENT DISORDERS</b>		<b>471</b>
<b>61</b>	<b>Restless Legs Syndrome</b>	<b>473</b>
	<i>Philip M. Becker</i>	
<b>62</b>	<b>Periodic Limb Movement Disorder</b>	<b>483</b>
	<i>Basheer Y. Khassawneh</i>	
<b>PART VIII SLEEP IN INFANTS AND CHILDREN</b>		<b>487</b>
<b>63</b>	<b>Ontogeny of EEG Sleep from Neonatal Through Infancy Periods</b>	<b>489</b>
	<i>Mark S. Scher</i>	

<b>64</b>	<b>Sleep in Infants and Children</b>	<b>507</b>
	<i>Stephen H. Sheldon</i>	
<b>65</b>	<b>Sleep and Breathing During Early Postnatal Life</b>	<b>511</b>
	<i>Aviv D. Goldbart, Riva Tauman, and David Gozal</i>	
<b>66</b>	<b>Congenital Syndromes Affecting Respiratory Control During Sleep</b>	<b>517</b>
	<i>Manisha B. Witmans, Maida L. Chen, Sally L. Davidson Ward, and Thomas G. Keens</i>	
<b>67</b>	<b>Sudden Infant Deaths</b>	<b>529</b>
	<i>A. Kahn, P. Franco, J. Groswasser, S. Scaillet, B. Dan, I. Kato, T. Sawaguchi, and I. Kelmanson</i>	
<b>68</b>	<b>Obstructive Sleep Apnea in Children</b>	<b>535</b>
	<i>Preetam Bandla and Carole L. Marcus</i>	
<b>69</b>	<b>The Sleepless Child</b>	<b>541</b>
	<i>William H. Moorcroft</i>	
<b>70</b>	<b>The Sleepy Child</b>	<b>547</b>
	<i>Gerald Rosen</i>	
<b>71</b>	<b>Craniofacial Syndromes and Sleep Disorders</b>	<b>551</b>
	<i>Laurel M. Wills, James Q. Swift, and Karlind T. Moller</i>	
<b>72</b>	<b>Medical Disorders</b>	<b>561</b>
	<i>John M. Palmer and Lee J. Brooks</i>	
<b>73</b>	<b>Sleep in Children with Neurological Disorders</b>	<b>567</b>
	<i>Suresh Kotagal</i>	
<b>74</b>	<b>Sleep in Children with Neuromuscular Disease</b>	<b>575</b>
	<i>Deborah C. Givan</i>	
<b>75</b>	<b>Sleep in Children with Behavioral and Psychiatric Disorders</b>	<b>581</b>
	<i>Judith A. Owens and Katherine Finn Davis</i>	
<b>76</b>	<b>Circadian Rhythm Disorders in Infants, Children, and Adolescents</b>	<b>589</b>
	<i>John H. Herman</i>	
<b>PART IX SLEEP IN THE ELDERLY</b>		<b>597</b>
<b>77</b>	<b>Normal Sleep in Aging</b>	<b>599</b>
	<i>Liat Ayalon and Sonia Ancoli-Israel</i>	
<b>78</b>	<b>Sleep Disordered Breathing in Older Adults</b>	<b>605</b>
	<i>Nalaka Gooneratne</i>	

<b>79</b>	<b>Insomnia and Aging</b>	<b>611</b>
	<i>Leah Friedman</i>	
<b>80</b>	<b>Sleep in Institutionalized Older Adults</b>	<b>615</b>
	<i>Jennifer L. Martin and Cathy A. Alessi</i>	
<b>PART X SLEEP AMONG WOMEN</b>		<b>621</b>
<b>81</b>	<b>Patterns of Sleep in Women: An Overview</b>	<b>623</b>
	<i>Helen S. Driver</i>	
<b>82</b>	<b>Sleep During Pregnancy and Postpartum</b>	<b>629</b>
	<i>Kathryn A. Lee</i>	
<b>83</b>	<b>Menstrual-Related Sleep Disorders</b>	<b>637</b>
	<i>Grace W. Pien and Elizabeth A. Beothy</i>	
<b>84</b>	<b>Sleep Disordered Breathing in Women</b>	<b>643</b>
	<i>M. Safwan Badr</i>	
<b>85</b>	<b>Sleep During the Perimenopausal Period</b>	<b>651</b>
	<i>Naomi L. Rogers and Ronald R. Grunstein</i>	
<b>86</b>	<b>Sleep During Postmenopause</b>	<b>657</b>
	<i>Karen E. Moe</i>	
<b>PART XI SLEEP IN THE RESPIRATORY DISORDERS</b>		<b>661</b>
<b>87</b>	<b>Respiratory Control During Sleep</b>	<b>663</b>
	<i>William R. Krimsky and James C. Leiter</i>	
<b>88</b>	<b>Asthma</b>	<b>669</b>
	<i>David A. Beuther and Richard J. Martin</i>	
<b>89</b>	<b>Chronic Obstructive Pulmonary Disease and Sleep</b>	<b>677</b>
	<i>Conrad Iber</i>	
<b>90</b>	<b>Sleep and Breathing in Cystic Fibrosis</b>	<b>685</b>
	<i>Amanda J. Piper, Maree A. Milross, and Peter T.P. Bye</i>	
<b>91</b>	<b>Restrictive Thoracic and Neuromuscular Disorders</b>	<b>693</b>
	<i>Christophe Perrin, Carolyn D'Ambrosio, Alexander White, Erik Garpestad, and Nicholas S. Hill</i>	
<b>92</b>	<b>Noninvasive Ventilation and Sleep</b>	<b>705</b>
	<i>G. Liistro and D. Rodenstein</i>	
<b>PART XII SLEEP IN THE CARDIAC DISORDERS</b>		<b>711</b>
<b>93</b>	<b>Hypertension and Cardiovascular Disease</b>	<b>713</b>
	<i>Robert D. Ballard</i>	
<b>94</b>	<b>Congestive Heart Failure</b>	<b>721</b>
	<i>Emilio Mazza and Indira Gurubhagavatula</i>	

- 95 Cardiac Arrhythmias and Sudden Death  
During Sleep** 727  
*Richard L. Verrier and Mark E. Josephson*

**PART XIII SLEEP IN THE OTHER MEDICAL  
DISORDERS** 733

- 96 Sleep and the Gastrointestinal Tract** 735  
*William C. Orr*
- 97 Renal Disease** 741  
*Kathy P. Parker*
- 98 Endocrine and Metabolic Disorders  
and Sleep** 745  
*Alexandros N. Vgontzas, Slobodanka Pejovic,  
and George P. Chrousos*
- 99 Sleep in Fibromyalgia and Chronic Pain** 759  
*Susan M. Harding and Teofilo Lee-Chiong*
- 100 Sleep and the Immune Response** 767  
*James M. Krueger and Jeannine A. Majde*

**PART XIV SLEEP IN THE NEUROLOGIC  
DISORDERS** 773

- 101 Alzheimer's Dementia** 775  
*Michael V. Vitiello*
- 102 Neurodegenerative Disorders** 783  
*David G. Harper*
- 103 Parkinson's Disease** 789  
*Michael H. Silber*
- 104 Seizures** 793  
*Margaret N. Shouse*
- 105 Headaches and Sleep** 805  
*Glen P. Greenough*
- 106 Cerebrovascular Disorders** 809  
*Bishoy Labib and Sarkis M. Nazarian*
- 107 Brain and Spinal Cord Injury** 817  
*Richard J. Castriotta*
- 108 The Blind Patient** 823  
*Damien Leger and Arnaud Metlaine*

**PART XV SLEEP IN THE PSYCHIATRIC  
DISORDERS** 827

- 109 Schizophrenia** 829  
*Rachel J. Norwood and Teofilo Lee-Chiong*



<b>110</b>	<b>Mood Disorders</b> <i>Roseanne Armitage</i>	<b>837</b>
<b>111</b>	<b>Anxiety Disorders and Sleep</b> <i>Michael Weissberg</i>	<b>845</b>
	<b>Appendix</b>	<b>851</b>
<b>112</b>	<b>Trauma and Post-traumatic Stress Disorder</b> <i>Giora Pillar, Louise Harder, and Atul Malhotra</i>	<b>857</b>
<b>113</b>	<b>Alcohol, Alcoholism, and Sleep</b> <i>Maren Hyde, Timothy Roehrs, and Thomas Roth</i>	<b>867</b>
<b>114</b>	<b>Drugs of Abuse and Sleep</b> <i>Maren Hyde, Timothy Roehrs, and Thomas Roth</i>	<b>873</b>

**PART XVI SLEEP IN SPECIAL PATIENT  
GROUPS** **879**

<b>115</b>	<b>Sleep and the Caregiver</b> <i>Patricia A. Carter</i>	<b>881</b>
<b>116</b>	<b>Sleep in Patients with HIV Disease</b> <i>Suzan E. Jaffe</i>	<b>885</b>
<b>117</b>	<b>The Patient with Cancer</b> <i>Christine A. Engstrom</i>	<b>893</b>
<b>118</b>	<b>Sleep in the Intensive Care Unit</b> <i>Samuel L. Krachman and Wissam Chatila</i>	<b>899</b>
<b>119</b>	<b>Sleep and the Cardiac Surgery Patient</b> <i>Nancy S. Redeker and Christine Hedges</i>	<b>909</b>
<b>120</b>	<b>Sleep Disturbances After Noncardiac Surgery</b> <i>Ismail Gögenur and Jacob Rosenberg</i>	<b>913</b>
<b>121</b>	<b>Relevance of Anesthesiology for Sleep Medicine</b> <i>Ralph Lydic and Helen A. Baghdoyan</i>	<b>927</b>
<b>122</b>	<b>Sleep at High Altitudes</b> <i>Wissam Chatila and Samuel Krachman</i>	<b>933</b>
<b>123</b>	<b>Sleep and Aviation</b> <i>John A. Caldwell</i>	<b>939</b>
<b>124</b>	<b>Sleep, Exercise, and Sports</b> <i>Carol A. Enderlin and Kathy C. Richards</i>	<b>947</b>

<b>125</b>	<b>Sleep, Sleep Loss, and Circadian Influences on Performance and Professionalism of Health Care Workers</b>	<b>953</b>
	<i>Sigrid Carlen Veasey</i>	
<b>126</b>	<b>The Student with Sleep Complaints</b>	<b>959</b>
	<i>Jagdeep Bijwadia and Donn Dexter</i>	
<b>PART XVII SLEEP ASSESSMENT METHODS</b>		<b>965</b>
<b>127</b>	<b>The Sleep Interview and Sleep Questionnaires</b>	<b>967</b>
	<i>Charles J. Bae and Joseph A. Golish</i>	
<b>128</b>	<b>Polysomnography</b>	<b>973</b>
	<i>Nancy A. Collop</i>	
<b>129</b>	<b>Pediatric Polysomnography</b>	<b>977</b>
	<i>May L. Griebel and Linda K. Moyer</i>	
<b>130</b>	<b>Introduction to Sleep Electroencephalography</b>	<b>989</b>
	<i>Selim R. Benbadis</i>	
<b>131</b>	<b>Monitoring Respiration During Sleep</b>	<b>1025</b>
	<i>Ulysses J. Magalang, Rami Khayat, and Naeem Ali</i>	
<b>132</b>	<b>Recording and Monitoring Limb Movements During Sleep</b>	<b>1031</b>
	<i>Crintz E. Scott</i>	
<b>133</b>	<b>Actigraphy</b>	<b>1035</b>
	<i>Christine Acebo</i>	
<b>134</b>	<b>pH Monitoring and Other Esophageal Tests</b>	<b>1039</b>
	<i>Gary R. Cott</i>	
<b>135</b>	<b>Psychological Assessment of the Sleep Patient</b>	<b>1045</b>
	<i>Amy B. Robinson Ikelheimer and Brian Hoyt</i>	
<b>136</b>	<b>Operating and Managing a Sleep Disorders Center</b>	<b>1051</b>
	<i>Richard S. Rosenberg</i>	
<b>137</b>	<b>Accrediting a Sleep Program</b>	<b>1055</b>
	<i>Donna Arand</i>	
<b>INDEX</b>		<b>1059</b>