Contents

SECTION 1: PRINCIPLES OF ANESTHESIA

Travis D Wilson

1. **General Anesthesia** **2**
   Travis D Wilson
2. **Regional Anesthesia** **6**
   Naveen Mehra
3. **Tracheal Intubation** **10**
   Samir J Gandhi
4. **Anesthesia Breathing Systems** **12**
   Travis D Wilson, J Jeffrey Andrews
5. **Monitoring in Anesthesia** **16**
   Milt G Poll, Travis D Wilson
6. **Capnography** **20**
   Brian M Fitzgerald
7. **Pulse Oximetry** **24**
   Patrick J Matthews, Brian M Fitzgerald
8. **Oxygenation** **26**
   Lois L Bready
9. **Neuromuscular Blocking Agents** **28**
   Adam Spjute, Travis D Wilson
10. **Laparoscopic Surgery** **32**
    Baker A Mitchell III
11. **Anesthetic Considerations for Robot-assisted Surgery** **36**
    Baker A Mitchell III
12. **Transitions of Care** **38**
    Bryant S Edwards, Christopher J Nagy, Lois L Bready

SECTION 2: PREANESTHESIA ASSESSMENT

Brooke G Harden

13. **Preoperative Laboratory Testing** **42**
    Brooke G Harden, Emily M Fischer
14. **Preoperative Airway Assessment** **44**
    Brooke G Harden, Kristen S Wells

15. **Difficult Airway: Recognized** 46
Brooke G Harden, Kristen S Wells

16. **Full Stomach Patient** 48
Brooke G Harden, Jacob Stetler

17. **Premedication of Adults** 52
Maria A Garcia

18. **Premedication of Children** 56
Christopher B McLeod, Brooke G Harden

19. **Perioperative Anticoagulation** 60
Matthew L McClure

20. **Malignant Hyperthermia: Prophylaxis** 64
Christopher B McLeod, Brooke G Harden

SECTION 3: PREOPERATIVE PROBLEMS: PULMONARY AND THORACIC DISORDERS

Leah E Gross

21. **Perioperative Wheezing** 68
Kelly A Gardner, Deborah K Rasch

22. **Asthma** 72
Gregory P Kraus

23. **Chronic Obstructive Pulmonary Disease** 74
Leah E Gross, Jorge Serrato

24. **Cigarette Smoking** 76
Vincent A Diaz, Dale C Capener

25. **Obstructive Sleep Apnea** 80
Vincent A Diaz, Dale C Capener

26. **Known or Suspected Tuberculosis** 82
Dale C Capener

27. **Restrictive Lung Disease** 84
Deborah Jo Levine

28. **Pulmonary Hypertension** 88
Deborah K Rasch, Leah E Gross

29. **Anterior Mediastinal Mass** 92
Kristi D Urias, Leah E Gross

SECTION 4: PREOPERATIVE CARDIOVASCULAR PROBLEMS

Leah E Gross

30. **Preoperative Cardiac Evaluation for Noncardiac Surgery** 96
Steven Lindauer, Leah E Gross

31. Perioperative Hypertension 100
Rudy Garza III, Leah E Gross

32. Cardiovascular Implantable Electronic Devices 104
Casey Drawert

33. Coronary Artery Disease 108
Leah E Gross, Olabode C Ogunwole

34. Diastolic Dysfunction 110
Leah E Gross, Gordon M Verber

35. Heart Transplant Recipient Undergoing Noncardiac Surgery 112
Susan H Noorily, Gordon M Verber

36. Anesthetic Management for Patients on Ventricular Assist Devices 114
Luiz Maracaja, Katharine H Zentner

37. Hypertrophic Cardiomyopathy 116
David Langdon, Sushrut Shidham

38. Mitral Valve Prolapse 118
Matthew D Read, David R Lowery

39. Mitral Stenosis 120
Matthew D Read, David R Lowery

40. Mitral Regurgitation 124
Matthew D Read, David R Lowery

41. Aortic Stenosis 128
David Langdon, Sushrut Shidham

42. Aortic Insufficiency 132
Matthew D Read, David R Lowery

43. Pericardial Tamponade 136
Matthew D Read, David R Lowery

44. Superior Vena Cava Syndrome 138
Matthew D Read, David R Lowery

45. Adult Congenital Heart Disease 142
Leah E Gross

SECTION 5: PREOPERATIVE NEUROLOGIC AND NEUROMUSCULAR PROBLEMS

Luis Llamas

46. Anesthesia for Dental Surgery in the Mentally Handicapped Patient 146
Joseph G Boice, Luis Llamas

47. Muscular Dystrophy 148
Bryce Foster, Maria A Garcia

48. Myotonic Dystrophy (Dystrophia Myotonica) 152
Rosemary Hickey, James McKenny

49. Myasthenia Gravis and Eaton-Lambert Syndrome 154
Heather L Quintela, Luis Llamas

50. Neuroleptic Malignant Syndrome 156
Jorge Serrato, Dimitar Dentchev

51. Neurofibromatosis 158
Rachel Maldonado, Dimitar Dentchev

52. Paraplegia/Quadriplegia 160
Lauren M Lyons , Luis Llamas

53. Multiple Sclerosis 162
Jessica Z Reed, Luis Llamas

54. Parkinson's Disease 164
Katharine H Zentner, Luis Llamas

SECTION 6: PREOPERATIVE ENDOCRINE PROBLEMS

Brooke G Harden

55. Diabetes Mellitus 168
Hong N Le

56. Obesity 172
Brooke G Harden, Olabode C Ogunwole

57. Hyperthyroidism 176
Susan H Noorily

58. Hypothyroidism 178
Susan H Noorily

59. Pheochromocytoma 180
Veronica F Lao

60. Carcinoid Syndrome 182
Brooke G Harden, Olabode C Ogunwole

61. Adrenocortical Insufficiency 186
Veronica F Lao

62. Hyperparathyroidism 190
Brooke G Harden, Steven M Prust

63. Acromegaly 192
Matthew S Murrell, Brooke G Harden

SECTION 7: PREOPERATIVE GASTROINTESTINAL PROBLEMS

Brooke G Harden

64. Gastroesophageal Reflux Disease 196
Brooke G Harden, Jacob Stetler

65. Hepatic Dysfunction....198
Lois L Bready

SECTION 8: PREOPERATIVE HEMATOLOGIC FUNCTIONS

Andrea L King

66. Hypercoagulability and Anticoagulation....202
Joseph R Holahan

67. Anemias....204
Joseph R Holahan

68. Hemoglobinopathies....206
Joseph R Holahan

69. Coagulopathies....208
Joseph R Holahan

70. Polycythemia Vera....212
Joseph R Holahan

71. Porphyria....214
Joseph R Holahan

72. Cold Autoimmune Disease....218
Joseph R Holahan

73. Heparin-induced Thrombocytopenia....220
Susan H Noorily, Gordon M Verber

SECTION 9: PREOPERATIVE RENAL PROBLEMS

Baker A Mitchell III

74. Chronic Kidney Disease....224
Lois L Bready

75. Anesthesia for Dialysis-dependent Patient....228
Lois L Bready

SECTION 10: OTHER PREOPERATIVE PROBLEMS

Paulina Cardenas

76. Geriatric Patient....232
Paulina Cardenas, Michael C Bowman

77. Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome....236
Matthew J Mazurek

78. Marfan Syndrome **238**
Bonny Carter Gillis

79. Mucopolysaccharidoses **242**
Paulina Cardenas

80. Epidermolysis Bullosa **246**
Paulina Cardenas

81. Rheumatoid Arthritis **250**
Paulina Cardenas

82. Systemic Lupus Erythematosus **254**
Cindy Van Praag

83. Scleroderma **258**
Veronica F Lao

84. Ankylosing Spondylitis **260**
Deena R Liles

85. Osteogenesis Imperfecta **262**
Ashlie R Stowers, Sara F McWilliams

86. Achondroplasia **264**
Paulina Cardenas, Lauren M Lyons

87. Cancer Patient **266**
Paulina Cardenas, Sara F McWilliams

88. Eating Disorders **270**
Paulina Cardenas

89. Thermal Injury **272**
Daniel M Bitner, Carlo J Alphonso

90. Jehovah's Witness Patient **276**
Paulina Cardenas, Nicolas E Rios

91. Latex Allergy **278**
Paulina Cardenas, Rachel Maldonado

SECTION 11: SPECIALTY ANESTHESIA AND CARDIOTHORACIC AND VASCULAR ANESTHESIA

Michael B Little

92. Invasive Hemodynamic Monitoring **282**
Michael B Little, John Richardson

93. Cardiopulmonary Bypass **284**
Justin W Wilson

94. Coronary Artery Bypass Grafting **288**
Steven Lindauer, Justin W Wilson

95. Off-pump Coronary Artery Bypass **292**
Steven Lindauer, Justin W Wilson

96. Acute Heart Failure in Cardiac Surgery 296
Michael B Little, Luiz Maracaja

97. Mitral Valve Replacement 300
Steven M Prust, Justin W Wilson

98. Aortic Valve Surgery 304
Luiz Maracaja, Katherine Slogic

99. Transcatheter Aortic Valve Replacement 308
Luiz Maracaja, Gregory J Stevens

100. Repair of Congenital Heart Disease: Bypass 312
Deborah K Rasch

101. Repair of Congenital Heart Disease: Non-bypass 316
Deborah K Rasch

102. One-lung Anesthesia 320
Braden J Hestermann, Arthur R Mielke

103. Thoracoscopy and Video-assisted Thoracic Surgery 324
Braden J Hestermann, Arthur R Mielke

104. Mediastinoscopy 328
Michael B Little

105. Tracheal Stenosis 332
Michael B Little, David Langdon

106. Endovascular Procedures 334
Michael B Little, Leah E Gross

107. Aortic Arch Aneurysms 336
Michael B Little, David Langdon

108. Descending and Thoracoabdominal Aortic Aneurysms 340
Michael B Little, Leah E Gross

109. Abdominal Aortic Aneurysms 344
Michael B Little

110. Lower Extremity Bypass Procedures 348
Michael B Little

111. Esophagogastrectomy 352
Michael B Little

112. Liver Resection 354
Garett E Jackson, Arthur R Mielke

SECTION 12: NEUROANESTHESIA

Luis Llamas

113. Surgery in the Sitting Position 358
Lee M Ragsdale, Rosemary Hickey

114. Intracranial Hypertension 362
Jared Brown, Rosemary Hickey

115. Traumatic Brain Injury 366
Asif Khan, Luis Llamas

116. Acute Spinal Cord Injury 370
Kristen S Wells, Dimitar Dentchev

117. Airway Management in Cervical Fracture 372
Kristi D Urias, Luis Llamas

118. Anesthesia for Transsphenoidal Hypophysectomy 374
Asif Khan, Luis Llamas

119. Carotid Endarterectomy 376
Olabode C Ogunwole, David Langdon

120. Intracerebral Aneurysm and Arteriovenous Malformation 378
Melissa Wilcox Blasko, Dimitar Dentchev

121. Anesthesia for Awake Craniotomy 382
Mason Singleton, Luis Llamas

122. Anesthesia for Epilepsy Surgery 386
Luis Llamas, Steven M Prust

123. Neuroendovascular Treatment of Intracranial Aneurysms and Arteriovenous Malformations 388
Matthew S Murrell, Luis Llamas

SECTION 13: PEDIATRIC ANESTHESIA

Nancy G Hoover

124. Anesthesia for Premature Infants 392
Nancy G Hoover

125. Congenital Diaphragmatic Hernia 394
Joshua M Hauser, Joshua S DuBois

126. Omphalocele and Gastroschisis 396
Matthew C Gummerson, Joshua M Hauser

127. Tracheoesophageal Fistula 398
Jonathan M Deeth

128. Necrotizing Enterocolitis 402
Jonathan M Deeth

129. Former Preterm Infants Undergoing Minor Surgery 404
Carl L McMullen, Nancy G Hoover

130. Pyloric Stenosis 406
Nancy G Hoover, Jonathan M Deeth

131. Pediatric Fluid Therapy in the Perioperative Period 408
Carl L McMullen, Nancy G Hoover

132. Pediatric Regional Anesthesia 410
Carl L McMullen

SECTION 14: OBSTETRIC AND GYNECOLOGIC ANESTHESIA

Deena R Liles

133. Analgesia for Labor and Delivery 414
Rafael Elenes

134. Anesthesia Management of Preterm Labor 418
Deena R Liles

135. Difficult Airway in Pregnancy 422
Bonny Carter Gillis

136. Obstetric Hemorrhage 426
Mohamed Tiouririne

137. Preeclampsia and Eclampsia 430
Paulina Cardenas, Nathon C Allred

138. Cesarean Delivery 434
Rafael Elenes

139. Pregnancy in Diabetic Patient 438
Paulina Cardenas, Nathon C Allred

140. Pregnancy in Cardiac Patient 440
Deena R Liles

141. Maternal Substance Use Disorder 444
Bonny Carter Gillis

142. Nonobstetric Surgery in Pregnancy 448
Andrea L King

143. Maternal Infections and Anesthesia 452
Deena R Liles

144. Amniotic Fluid Embolism 456
Mohamed Tiouririne

145. Morbidly Obese Parturient 458
Rafael Elenes

146. Anesthesia for the Patient with Multiple Gestation 460
Paulina Cardenas, Nathon C Allred

147. Fetal Monitoring 462
Maria A Garcia

148. Postpartum Tubal Ligation 464
Mohamed Tiouririne

149. Neonatal Resuscitation 466
Bonny Carter Gillis, Deena R Liles

150. Ex-utero Intrapartum Treatment Procedure 470
Christopher J Nagy, Adam C Braden

151. Cardiopulmonary Arrest in Pregnancy: Special Considerations 472
Andrea L King

SECTION 15: ANESTHESIA FOR GENERAL SURGERY

Baker A Mitchell III

152. Bariatric Surgery 476
Andrew K Matthies, Crystal A Manohar

153. Surgery of the Acute Abdomen 478
Andrew K Matthies, Crystal A Manohar

SECTION 16: UROLOGIC ANESTHESIA

Baker A Mitchell III

154. Nephrectomy 482
Crystal A Manohar

155. Transurethral Resection of the Prostate 484
Baker A Mitchell III

156. Extracorporeal Shock Wave Lithotripsy 488
Baker A Mitchell III

157. Percutaneous Nephrolithotomy 492
Baker A Mitchell III

SECTION 17: ANESTHESIA AND TRANSPLANTATION

Justin W Wilson

158. Organ Donation—After Brain Death and after Circulatory Death 496
Punit Singh, Lois L Bready

159. Renal Transplantation 498
Rigoberto Luis Sierra-Anderson III, Erin Brockway

160. Cardiac Transplantation 502
Justin W Wilson

161. Lung Transplantation 504
Justin W Wilson

162. Liver Failure and Orthotopic Liver Transplantation 508
Rigoberto Luis Sierra-Anderson III, Justin W Wilson

163. Pancreatic Transplantation 512
Michael B Little

SECTION 18: ANESTHESIA FOR ENDOSCOPY AND HEAD AND NECK SURGERY

Travis D Wilson

164. Foreign Body Aspiration 516
Travis D Wilson

165. Acute Epiglottitis 518
Tyler A Anderegg, David A Layer

166. Head and Neck Abscess Evacuation 522
Mark A Cheney, Kurt R Bolin

167. Maxillary, Mandibular and Temporomandibular Joint Surgery 524
Travis D Wilson

168. Cleft Lip and Palate 528
Samir J Gandhi

169. Post-tonsillectomy Bleeding 530
Travis D Wilson

170. Vocal Cord Papillomas 534
Karl A Lautenschlager

171. Upper Airway Obstruction 538
Melanie T Lawinger

172. Laser Surgery 540
Sally Combest

173. Endoscopic Sinus Surgery 544
Lois L Bready

174. Head and Neck Oncologic Surgery 546
Christopher V Maani, Elizabeth V Maani

175. Laryngoscopy 550
Christopher V Maani, Jonathan Sherrod

176. Bronchoscopy 554
Christopher V Maani, Scott Kaser

SECTION 19: OPHTHALMOLOGIC ANESTHESIA

Julia Bustamante

177. Open-globe Injury 558
Kelly A Gardner, Julia Bustamante

178. Anesthetic Management of Cataract Extraction 560
Julia Bustamante

179. Retinal Detachment 562
Julia Bustamante, Monica Rivera

180. Anesthesia for Strabismus Surgery in Children 564
Julia Bustamante, Matt Hermansen, Monica Rivera

181. Perioperative Corneal Abrasion 566
Julia Bustamante, Tim Farris

SECTION 20: ANESTHESIA FOR SPINAL AND ORTHOPEDIC PROCEDURES

Maxim S Eckmann

182. Scoliosis 570
Maxim S Eckmann, Brian T Boies

183. Total Hip Replacement 574
Naveen Mehra, Clint Thome

184. Knee surgery 578
Naveen Mehra, Clint Thome

185. Anesthesia for Shoulder Surgery 582
Wendy B Kang

186. Limb Salvage Osteotomy 586
Maxim S Eckmann, Naumit S Bhandari

187. Spinal Decompressive Surgery 590
Garett Jackson, Heather J Higgins

SECTION 21: TRAUMA ANESTHESIA

Garrett Starling

188. Evaluation of the Trauma Patient 594
Craig C McFarland, James A Gill

189. Anesthesia for the Trauma Patient 598
Craig C McFarland, Daniel Moseley

190. Massive Blood Transfusion 602
Craig C McFarland, James A Gill

191. Hypotension in the Acutely Traumatized Patient 604
Hong N Le

192. Hypoxemia in the Acutely Traumatized Patient 608
Hong N Le

SECTION 22: REMOTE LOCATIONS

Garrett Starling

193. Anesthesia for Electroconvulsive Therapy 612
Gina Matteson, David Matteson

194. General Anesthesia in Dentistry 616
Garett E Jackson, Scott Blackwell

195. Magnetic Resonance Imaging 618
Kimberly D Milhoan, Garrett Starling

196. Cardiac Catheterization Laboratory 622
Christopher B McLeod, Garrett Starling

197. Anesthesia in the Endoscopy Suite 624
Nina Mahnke, Ashlie R Stowers

198. Transjugular Intrahepatic Portosystemic Shunt 626
Paige Cohick, Garrett Starling

199. Office-based Anesthesia 630
Sally Combest, Tyler C Roe

SECTION 23: POSTOPERATIVE MANAGEMENT

David Clanton

200. Acute Postoperative Analgesic Management 634
David Clanton, Rudy Garza III

201. Postoperative Nausea and Vomiting 638
Carol E Campbell

202. Postoperative Cognitive Dysfunction 640
Adrienne K Cummings

203. Delayed Awakening or Delirium 642
Carol E Campbell

204. Perioperative Visual Loss 646
Sally Combest, Adrienne K Cummings, Stephen C Bird

205. Postoperative Hypotension 648
Stephen C Bird, Adrienne K Cummings

206. Postoperative Hypertension 650
David Clanton, Justin P Moreland

207. Prolonged Postoperative Apnea 654
Carol E Campbell

208. Weaning from Mechanical Ventilation 658
David Clanton, Nicolas E Rios

209. Neurologic Sequelae Following Regional Anesthesia 662
Matthew L McClure, Scott Spendlove

210. Acute Kidney Injury 666
Bradley A Reel, David Clanton

211. Postdural Puncture Headache 670
Ameet Nagpal, Samuel H Stevens

212. Postoperative Hepatic Dysfunction 674
Lois L Bready

213. Dental Injuries Associated with General Anesthesia 678
Joseph G Boice, David Clanton

214. Management of a Needlestick 680
David Clanton, Bradley A Reel

SECTION 24: PERIOPERATIVE EMERGENCIES

Steven G Venticinque

215. Cardiac Arrest 684
Yvonne I Claflin, Steven G Venticinque

216. Bradycardia with a Pulse 688
Sara McAlpin, David Matteson

217. Tachycardia with a Pulse 690
Sara McAlpin, David Matteson

218. Difficult Airway: Cannot Intubate–Can Ventilate Scenario 694
Rene A Larrieu, Steven G Venticinque

219. Difficult Airway: Cannot Intubate–Cannot Ventilate Scenario 698
Rene A Larrieu, Steven G Venticinque

220. Anaphylaxis and Anaphylactoid Reactions 702
Bradley A Reel, Steven G Venticinque

221. Local Anesthetic Toxicity 706
Michael Patzkowski

222. Severe Sepsis and Septic Shock 708
Steven G Venticinque

223. Malignant Hyperthermia: Treatment of Acute Episode 712
Lois L Bready

224. Hypovolemic Shock 716
Steven G Venticinque

225. Cardiogenic Shock 720
Yvonne I Claflin, Steven G Venticinque

226. Neurogenic Shock: Acute Management 722
Bradley A Reel, Steven G Venticinque

227. Myocardial Ischemia Associated with Noncardiac Surgery 724
Bradley A Reel, Steven G Venticinque

228. Acute Hyperkalemia 728
Michael A DiMeola, Ferdinand K Bacomo

229. Thyroid Storm 732
Bradley A Reel, Steven G Venticinque

230. Intraoperative Hypoxemia 736
Kathryn Putnam

231. Elevated Peak Inspiratory Pressure 740
Steven G Venticinque

232. Intraoperative Acute Bronchospasm 744
Garrett Norton, Michael A DiMeola

233. Low-pressure (Apnea) Alarm 746
Steven G Venticinque

234. Decreased Inspired Oxygen Concentration Alarm 750
Steven G Venticinque

235. Aspiration Syndromes 752
Major Daun J Lai

236. Perioperative Seizures 756
Major Daun J Lai

SECTION 25: ADMINISTRATIVE ISSUES

Benjamin J Wallisch

237. Informed Consent in Anesthesiology 760
Adriaan T Jansse, Wendy B Kang

238. Advanced Directives 762
Wendy B Kang

239. 'Do Not Resuscitate' Orders in the Operating Room 764
Adriaan T Jansse, Wendy B Kang

240. Substance Use Disorder in Anesthesiology: Identification, Intervention, and Management 766
Benjamin J Wallisch

241. Reentry for the Anesthesiologist with a History of Substance Abuse Disorder 768
Benjamin J Wallisch

242. Operating Room Management 770
Britta DeVolder, Benjamin J Wallisch

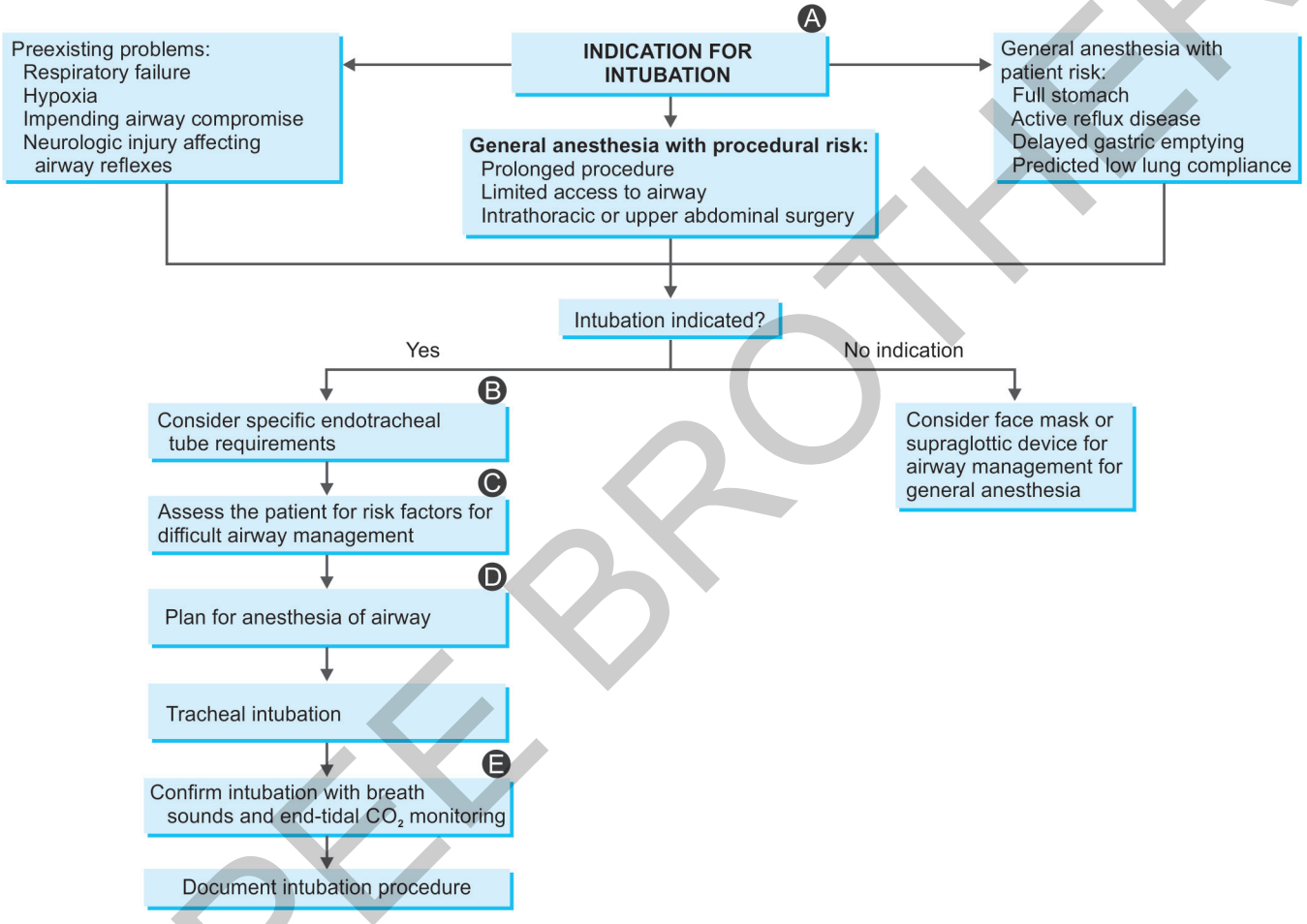
243. Operating Room Protocols 772
Alison Peterson, Benjamin J Wallisch

Index 775

CHAPTER

3 Tracheal Intubation

Samir J Gandhi



Many options are available for airway management, ranging from noninvasive (e.g. face mask) to surgically invasive (e.g. tracheostomy). Definitive airway management implies provision of an airway that will allow positive pressure ventilation and protect the airway from aspiration. This is most commonly accomplished by tracheal intubation (TI).

A There are multiple indications for TI. In an emergency setting these indications include respiratory failure secondary to hypoventilation or hypoxemia, impaired mental status or inability to protect the airway from aspiration or bleeding, and predicted airway compromise, such as in a patient with smoke inhalation injury. TI is also absolutely indicated for airway maintenance in patients who are at risk for aspiration when undergoing general anesthesia, including but not limited to patients with full stomachs or known delayed gastric emptying, secondary to autonomic neuropathy or obstruction. Relative indications for TI include general anesthetics in which patients may be positioned such that the anesthesiologist does not have access to the airway, prolonged procedures, patients predicted to require postoperative ventilation, or patients who have fixed reductions in lung compliance who may need high peak inspiratory pressures to maintain ventilation. If general

JAYPEE BROTHERS

anesthesia is required, but TI is not necessary, consideration should be given to either mask ventilation or alternate supraglottic airway device. Laryngeal mask airways (LMAs) are widely used and may accommodate positive pressure ventilation up to 20 cm H_2O when well-seated; however, care should be taken to avoid higher peak airway pressures, as the lower esophageal sphincter will not prohibit gastric insufflation at pressures above 20 cm H_2O.[1,2] Contraindications for the use of an LMA include, but are not limited to, non-fasted patients, morbid obesity, chronic obstructive pulmonary disease (COPD), low pulmonary compliance, Zenker diverticulum, trauma, and uncontrolled gastroesophageal reflux disease.[3]

B When planning for TI, determine whether the surgical procedure will require an approach via the nasal or oral route. Also, consider requirements for specific types of endotracheal tubes for a given procedure. For example, intrathoracic procedures may require double-lumen endobronchial tubes for lung isolation. Airway procedures may require wire-reinforced endotracheal tubes or right-angled endotracheal (RAE) tubes to accommodate surgical field avoidance. Procedures involving airway laser use may require laser-resistant tubes because the polyvinyl chloride (PVC) material in normal endotracheal tubes can be damaged and catch fire with certain types of laser use.

C Prior to any airway management, perform an airway examination to predict whether difficulty may be expected[4] (see Chapters 218 and 219).

D Prior to TI, perform either induction of general anesthesia or local anesthetic topicalization of the airway to facilitate endotracheal tube placement. Topicalization may be accomplished via a variety of methods. To anesthetize the airway, partial blockade of the glossopharyngeal and vagus nerves must be performed, and if intubating via a nasal route, part of the trigeminal nerve must also be included. The simplest technique involves spraying local anesthetic directly onto the mucosa. Alternatively, glossopharyngeal, superior laryngeal, and recurrent laryngeal nerve blocks may be performed. Regardless of technique, the goals of proper intubation include smooth and atraumatic endotracheal tube placement, prevention of aspiration, hemodynamic stability and minimization of autonomic stimulation associated with this procedure. Better quality of intubation conditions may correlate with reduced frequency of intubation complications.[5]

E After TI has been performed, confirm placement of the endotracheal tube using clinical signs, such as bilateral chest rise, auscultation of breath sounds, and capnometry whenever possible. Esophageal intubation and endobronchial intubation are usually not life-threatening unless unrecognized.[5] For documentation purposes, describe the method of TI, equipment used, tube size, depth at which it was secured, and assign a grade to the laryngeal view during the intubation. The modified Cormack-Lehane Score (MCLS) is broadly used to classify the laryngeal view during direct laryngoscopy. Using this classification, Grade 1 is a full view of the vocal cords, Grade 2A is a partial view of the vocal cords, Grade 2B a view of the arytenoids and epiglottis, Grade 3 is a view of only epiglottis, and Grade 4 is the absence of any identifiable airway structures.[6] However, a previously documented view may not always be obtainable on subsequent intubation attempt, as the ability to obtain a laryngeal view is significantly affected by patient position, changes in patient weight, mouth opening, neck mobility, or changes in laryngeal anatomy.

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JAYPEE BROTHERS