

<b>Associate Editors</b>	<b>vii</b>
<b>Contributors</b>	<b>ix</b>
<b>An Update on Postoperative Delirium</b>	<b>1</b>
By Matthew B. Friese and Sascha Beutler	
Prevalence	1
Risk factors	2
Morbidity and mortality are increased in patients with delirium	3
Hypoactive, hyperactive, and mixed types of delirium	4
Diagnostic tools	4
Delirium increases the cost of medical care	5
Pathophysiology	6
Prevention and the role of the anesthesiologist	7
Pharmacologic approach to delirium reduction	8
Treatment	9
Postoperative delirium and postoperative cognitive dysfunction	9
Summary	10
References	10
<b>Consciousness and Anesthesia: An Update for the Clinician</b>	<b>13</b>
By Magnus K. Teig, Anthony G. Hudetz, and George A. Mashour	
Introduction	13
Definition of awareness	14
Epidemiology of awareness	15
Incidence of awareness	15
Describing the severity of awareness	15
Risk factors for awareness	15
Underdosed patients	16
Patient resistance factors	16
Measuring the depth of anesthesia	17
Minimum alveolar concentration–based techniques	18
EEG-based techniques	18
Studies of the BIS and awareness	19
Limitations of the BIS	19
Objective measures of connected consciousness and memory	20
Can memory be monitored?	20
	<b>xi</b>

How is consciousness measured?	21
Suppression of metabolic activity	21
Suppression of the thalamus	21
Metabolic and functional suppression of frontoparietal networks	22
EEG-based connectivity in frontoparietal networks	22
Summary	23
References	23

## **Carotid Artery Interventions and Anesthetic Technique: An Evidence-Based Review** **29**

By Ryan P. Pong and Neil A. Hanson

Introduction	29
Available treatments	30
Perioperative management	32
Preoperative evaluation	32
Neurologic examination	33
Cardiac	33
Hypertension	33
Pulmonary	33
Hematology	34
Monitoring considerations	34
Anesthetic technique-general versus local	35
Anesthetic technique: regional	35
Deep cervical plexus	38
Superficial cervical plexus	38
Anesthetic technique: general	39
Choice of drugs	39
Emergence	40
Intraoperative considerations	40
Blood pressure	40
Glycemic control	41
Carbon dioxide	41
Postoperative considerations	41
Neck hematoma	41
MI	41
Hyperperfusion syndrome	41
Stroke	42
Other postoperative considerations	42
Summary	42
References	42

## **Anesthetic Considerations in TEVAR and TAVI** **47**

By Christopher M. Reidy

Introduction	47
TEVAR	48
Procedure	48
Indications	48
Thoracic aortic aneurysm	48

Type B aortic dissection	48
Traumatic aortic injury	49
Complications	49
Mortality	49
Spinal cord injury	49
Stroke	50
Durability	50
Perioperative management	50
Anesthetic type	50
Vascular access	51
Transesophageal echocardiography	51
Evoked potential monitoring	52
CSF drainage	52
Postoperative management	53
TAVI	53
Procedure	53
Device access	53
Rapid ventricular pacing	54
Balloon aortic valvuloplasty	54
Device deployment	54
Confirmation of function	54
Closure and hemostasis	54
Indications	54
Complications	55
Mortality	55
Stroke	55
Aortic regurgitation	56
Other complications	56
Perioperative management	56
Logistic considerations	56
Anesthetic type	57
Vascular access	57
Hemodynamic management	57
Role of transesophageal echocardiography	57
Postoperative management	58
References	58

**Continuous Peripheral Nerve Blocks for Pediatrics 61**

By Ravi Shah, Amod Sawardekar, and Santhanam Suresh

Indications	61
Techniques	62
Complications and adverse side effects	62
Infusion strategies	62
CPNBs for upper limb surgery	62
Infraclavicular approach to the brachial plexus	62
Indications	62
Technique	63
Complications	64
Postoperative care	64

Supraclavicular approach to the brachial plexus	64
Indications	64
Technique	64
Complications	65
Postoperative care	65
Interscalene approach to the brachial plexus	65
Indications	65
Technique	65
Complications	66
CPNBs for abdominal surgery	66
Transversus abdominis plane block and continuous catheters	66
Indications	66
Technique	67
Complications	68
CPNBs for lower limb surgery	68
Continuous femoral nerve Block	68
Indications	68
Technique	69
Complications	69
Continuous sciatic nerve block	69
Indications	69
Technique	70
Complications	71
Summary	71
References	71

## **Anesthetic Considerations for Robotic Surgery in the Steep Trendelenburg Position** **75**

By Alain F. Kalmar, Andre M. De Wolf, and Jan F.A. Hendrickx

Introduction	76
Preoperative consideration	76
Positioning	76
Initial positioning	77
Postinduction	79
Effects on organ systems	81
Hemodynamics	81
Gas exchange	82
Lung mechanics	84
CNS	87
Renal	92
Choice of anesthetic agents	92
Fluid management	92
Emergence and postoperative care	92
Contraindications	93
Summary	93
References	94

<b>Modern and Evolving Understanding of Cerebral Perfusion and Autoregulation</b>	<b>97</b>
By Nathaniel H. Greene and Lorri A. Lee	
Introduction	98
Fundamentals of CBF	98
Circle of Willis	100
Control of CBF	100
Chemical/metabolic control	100
Neurogenic control	103
Myogenic control/autoregulation	104
Lower limit of autoregulation	106
Historical interpretation of the LLA for cerebral ischemia	106
Defining LLA as a percentage reduction of MAP below baseline	106
Effect of simultaneous factors on CBF: clinical scenarios	109
Effect of carbon dioxide on autoregulation in awake and anesthetized subjects	109
Effect of hypotension on carbon dioxide reactivity	110
Effect of temperature and propofol dose on CBF and CMRO <sub>2</sub>	111
Effect of anemia on CBF and autoregulation	111
Effect of anemia and hypotension on CBF and O <sub>2</sub> delivery	112
Anesthetic drugs and vasoactive agents	112
Calcium channel blockers	113
NO donors	114
Sympatholytics and sympathomimetics	115
Intravenous anesthetic agents	116
Volatile anesthetic agents	116
Patient disease states	116
Anatomic variants	117
Age effects	118
Chronic hypertension	118
Carotid stenosis/occlusion	119
Traumatic brain injury	120
Effects of positioning on cerebral perfusion	120
Surgery in the beach chair position	120
Venous effect on CPP: ischemic optic neuropathy associated with prolonged prone or steep trendelenburg position	122
Intraoperative monitors for assessment of CBF and cerebral ischemia	123
References	123

<b>Conversion to ICD-10: Implications for Anesthesiologists and Their Practices</b>	<b>131</b>
By Juhan Paiste, Loretta Kowalick, Maria D. Motovidlak-Thomas, and Ivan J. Perry	

Introduction	131
History overview	132
ICD-9 overview	133
ICD-10 overview	133
Differences between ICD-9 and ICD-10	135

ICD-10 effects on physician reimbursements	135
Transitioning from <i>ICD-9</i> to <i>ICD-10</i>	136
<i>ICD-9</i> versus <i>ICD-10</i> versus <i>ICD-11</i> ? benefits versus consequences	137
Will <i>ICD-10</i> and <i>ICD-11</i> improve patient care?	140
Implementation	140
Summary	144
References	144

## **Observational Data: Pitfalls and Pearls** **147**

By Brian D. Sites

Observational data promised something special	147
They were wrong	148
Study design	148
Methodological problem: confounding	149
Techniques to compensate for confounding	149
Statistical considerations in observational data	150
Why ever perform observational research?	152
Summary	153
Acknowledgments	153
References	153

## **Checklists, Briefings, and Operating Room Safety** **155**

By Michael F. Mulroy

Introduction	155
History of the checklist	156
Types of checklists	156
Checklists and the medical community	157
Early medical checklists	157
Applying checklists to surgery	159
The world health organization safe surgery project	159
Initial success of the WHO checklist	162
Adopting the WHO checklist: barriers appear	162
Limitations of checklists	163
Barrier of hierarchy	164
Role of cultural change, team training	164
The checklist as a step to help overcome barriers	165
Other challenges of adoption: time and money, sustainability	165
Future directions	166
Summary	166
References	166

## **Index** **171**