

Perioperative Considerations and Positioning for Neurosurgical Procedures

A Clinical Guide

Adam Arthur
Kevin Foley
C. Wayne Hamm
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Foreword

“It wasn’t raining when Noah built the arc.”

Howard Joseph Ruff (December 27, 1930–November 12, 2016),
financial adviser and author of the investing newsletter The Ruff Times

The importance of preparation and attention to detail in the field of neurosurgery cannot be overemphasized. Perhaps in no other endeavor of surgery is there so little tolerance for error.

In the history of medicine, the chapter on neurosurgery is among the most interesting. Archaeological evidence proves that humans were performing trephinations since prehistoric times. Despite the early genesis of surgery on the human skull and brain, the specialty of neurosurgery is a relatively recent evolutionary product of the broader field of general surgery. The field made little progress until Harvey Cushing established neurosurgery as a unique discipline in the twentieth century. Our specialty was limited by a poor understanding of pathology, archaic imaging of that pathology, primitive anesthesiology, limited intraoperative visualization, and marginal postoperative care.

The past few decades have witnessed dramatic improvements in all of these important facets of neurosurgical care: introduction of the operating microscope, mind boggling advances in neuroimaging, development of the subspecialty of neuroanesthesiology, introduction of neurocritical care, neuroendovascular therapy, neuromodulation and molecular biology, to name a few. Despite these remarkable advances, the practicing neurosurgeon must never lose sight of the basic surgical principles and details that often determine the outcome for our patients.

The attention to detail required for success in neurosurgery begins with patient selection and continues throughout the patient’s hospital course and postoperative care. Once the decision for surgery has been agreed upon, every detail matters and proper preparation will influence the outcome. The natural tendency to focus on high-tech issues may create complacency and neglect of the basics.

The editors have provided the first monograph dedicated to the important, but often trivialized, issue of surgical positioning in neurosurgical procedures. This seemingly routine issue may have a profound influence on the outcome of an otherwise well-planned procedure.

Although certain standard positions are typically used for most common neurosurgical procedures, the positioning must be tailored to the individual patient body habitus and comorbidities. Selection of the appropriate

position must balance patient comfort, surgeon comfort, and a vast array of physiological issues and therefore must be tailored to the unique patient and their procedure.

The contributing authors have created an authoritative reference book that includes a balanced presentation of the positions commonly utilized in neurosurgery, alternative positions for unique situations, and a comprehensive discussion of the potential complications associated with all positioning options. This treatise should be read and studied by neurosurgeons of all levels of training and experience as well as those anesthesiologists who are so vitally important in determining the outcomes of our procedures.

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Preface

“I would like to see the day when somebody would be appointed surgeon somewhere who had no hands, for the operative part is the least part of the work.”

—Harvey Cushing

If a neurosurgical patient isn’t positioned well, it can make operating with both hands unfeasible for the surgeon. Neurosurgical positioning errors can make surgery difficult or impossible in a myriad of ways. Aside from making the pathology inaccessible, improper positioning can result in increased blood loss, cardiopulmonary complications, and herniation.

Patients undergoing a procedure at the hands of any type of surgeon must be positioned properly to allow access to the surgical pathology and to keep the patient safe during the procedure. Most surgical specialties involve one or two “standard” and well-described positions that allow surgical access. In some surgical specialties, positioning requires consideration as a means of minimizing blood loss. Some surgical specialties must even give consideration to positioning with regard to using gravity as a means of minimizing retraction on eloquent tissues. Neurosurgery requires that we consider all of these factors and how they are impacted in a number of different positions.

The neurosurgeon is confronted with variations in pathology that are constantly requiring adjustments to “standard” positions. Thus, a full working knowledge of how to position patients to achieve the above desired goals, the expected results of the applied position, the complications of the applied position, and means of minimizing and/or avoiding those complications is necessary. This working knowledge must incorporate existing recommendations and guidelines and be applied with a reciprocal knowledge of the operating room nurses and anesthesia personnel for maximum surgical benefit with minimum surgical complications. As certain positions are infrequently used and operating room personnel and anesthesia providers are often changing, the neurosurgeon can sometimes find themselves the party most acquainted with the position and its attendant risks and benefits.

Our intent is that this work helps to advance the understanding of neurosurgical positioning and improve the safety of surgery for neurosurgical patients.

This book owes a great debt to Dr. John Martin and Dr. Mark Warner for their pioneering work in the three editions of *Positioning in Anesthesia and Surgery*.

Memphis, TN
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Contents

1 Positioning Patients for Neurosurgical Procedures:	
A Historical Perspective	1
Mallory Roberts and Jon H. Robertson	
History of Anesthesia in Neurological Surgery	1
Harvey Cushing	2
Hunterian Laboratory at Johns Hopkins	5
Local Anesthesia	6
Positioning in Neurological Surgery	6
Use of the Operating Microscope	7
Endovascular Suite	9
Cranial Procedures	10
Spine Procedures	11
Partnership Between Neuroanesthetist and Neurosurgeon	15
A Brief History of Semmes-Murphey Neurosurgery in Memphis, Tennessee	15
Conclusion	17
References	18
2 Biomechanics and the Mathematics of Positioning	19
George F. Young	
References	25
3 Anesthesia and Patient Positioning	27
C. Wayne Hamm	
Introduction	27
Supine Position	27
Spinal Procedures	27
Complications Associated with the Supine Position	29
Cranial Procedures	29
Sitting Position	31
Spinal Procedures	31
Cranial Procedures	32
Complications Associated with the Sitting Position	34
Lateral Position	34
Spinal Procedures	35
Cranial Procedures	36
Complications Associated with the Lateral Position	38
Prone Position	38

Spinal Procedures	39
Cranial Procedures	41
Complications of the Prone Position.	42
References.	45
4 Preoperative Assessment of the Patient for the Planned Position	51
C. Wayne Hamm and Jaafar Basma	
Introduction.	51
Describing the Process of Surgery and Anesthesia and Developing Rapport with the Patient.	51
Content of the Preanesthetic Evaluation Includes but is not Limited to Readily Accessible Medical Records	53
Patient Interview	55
Preoperative Tests When Indicated.	56
Other Consultations When Appropriate	56
Basic Elements of a Directed Preanesthetic Physical Examination	57
Cervical Stability	57
Evaluation of Cervical Instability and Neural Compression	60
Incidence of Cervical Stenosis Accompanying Lumbar Stenosis	61
Evaluation for Intrinsic Cervical Spinal Cord Pathologies.	61
References.	62
5 Organization of the Operating Room for Neurosurgical Procedures	65
Jaafar Basma and Daniel Hoit	
Introduction and General Principles	65
History of Operating Room Organization.	66
Basic Scheme	67
Operating Table and Head Holder.	68
Operating Microscope.	69
Surgeon's Positioning	70
Anesthesia Space	71
Lighting.	71
Instrument Tables	72
Basic Surgical Devices: Bovie, Bipolar, Suction Cannulas, Drill, and Pedals.	73
Airflow Regulation and Prevention of Surgical Infections	74
Neuro-Imaging and Neuro-Navigation Devices.	75
Neuro-Monitoring.	75
Intraoperative Angiography, Endovascular Suite, and "hybrid OR"	76
Doppler Probes	77
Storage, Supplies, and Trash Management.	77
Communication and Teamwork	77
Patient Safety and Checklists	78
Conclusion	78
References.	78

6 Overall Positioning Considerations for Intracranial Procedures	81
Adam Arthur	
7 Intracranial Procedures in the Supine, Semi-Sitting, and Sitting Positions	83
Jaafar Basma, Vincent Nguyen, and Jeffrey Sorenson	
Introduction	83
General Setup	84
Supine Position	84
Sitting Position	85
Complications	85
Supine Position	85
Sitting Position	86
Rationale for Approach-Guided Positioning:	
Basic Mechanics and Nuances	87
Head, Neck, and Body Mechanics	88
Surgical Perspectives to Anatomical Corridors	88
Gravity-Dependent Retraction	90
Ergonomic Working Angles	91
The Pterional Approach (Yasargil)	91
Fronto-Temporal Orbito-Zygomatic Approach (FTOZ) and Supraorbital Modification	92
Lateral Supraorbital and “Eye-Brow Incision” Approaches	92
Pretemporal Approach	93
Temporal and Subtemporal Approaches	93
Parieto-Occipital Approaches	94
Midline Approaches	94
Bifrontal Craniotomy and Subfrontal Approach	94
Anterior Interhemispheric Transcallosal Approach	94
Cranio-Facial Approaches	95
Transnasal and Trans-Sphenoidal Approaches	95
Transoral Approaches	95
Infratentorial Approaches	96
Asleep-Awake Craniotomies	97
Conclusion	98
References	98
8 Intracranial Procedures in the Lateral Position	101
L. Madison Michael II and Douglas R. Taylor	
Part I: Introduction	101
Part II: The Lateral Position for Intracranial Neurosurgery	102
Part III: Complications Specific to the Lateral Position	105
Part IV: Conclusion	109
References	109
9 Intracranial Procedures in the Prone Position	111
Mirza Pojskic and Kenan I. Arnautovic	
Introduction	111
Physiology of the Prone Position	111

Influence of the Prone Position on Intracranial Pressure	112
The Full Prone Position: Technique and General Considerations . .	113
The Concorde Position: Technique and General Considerations . .	118
Indications.	120
Supratentorial Lesions	121
Infratentorial Lesions	121
Lesions of the Cerebellum and Brainstem	122
Lesions of the Pineal Region	123
Complications	124
Neuronavigation in the Prone Position	129
Neuromonitoring in the Prone Position	129
References.	130
10 Spinal Surgery Positioning Overview	133
Kevin Foley	
Introduction.	133
Optimal Surgical Exposure.	133
Patient Safety	134
Operative Ergonomics.	134
Conclusion	135
11 The Supine, Sitting, and Lithotomy Positions	137
Shaheryar F. Ansari and Jean-Pierre Mobasser	
Introduction.	137
The Sitting Position.	137
Positioning the Patient	137
Procedures Performed.	138
Anesthesia and Monitoring	138
Advantages	138
Complications and Disadvantages	139
The Supine Position	140
How to Position the Patient.	140
Procedures Performed in the Supine Position.	141
Anesthesia and Monitoring	141
Advantages	141
Disadvantages and Complications	141
The Lithotomy Position	142
How to Position the Patient.	142
Anesthesia and Monitoring	144
Procedures Performed in the Lithotomy Position.	144
Advantages	144
Disadvantages and Complications	144
Conclusion	145
References.	145
12 Spinal Procedures in the Lateral Position	149
Matthew T. Brown, Raul Cardenas, and Julius Fernandez	
Introduction.	149
Positioning for the Elective Spine.	149

Positioning for the Traumatic Spine	153
Physiologic Considerations.	155
Complication Avoidance.	155
Conclusion	157
References.	157
13 Spinal Procedures in the Prone Position.	159
Prayash Patel and Christopher Nickelle	
Introduction.	159
Preoperative Assessment.	159
The Full Prone Position	160
Preparations.	160
Types of Tables	161
Turning the Patient Prone	163
Full Prone Position	164
Cervical Spine Procedures in Prone Position	165
Unstable Cervical Pathology.	168
Thoracic and Lumbar Procedures in Prone Position.	168
Unstable Thoracic or Lumbar Pathology	169
Special Considerations for Navigated Instrumentation	170
Complications	171
Visual Complications	171
Peripheral Nerve and Brachial Plexus Injuries	171
Myocutaneous Complications.	172
References.	173
14 Special Considerations in Positioning for Neurosurgical Tumors: Spinal	175
Jason A. Weaver	
Oncologic Terms Applied to the Spine	176
The Importance of Pathology on Positioning	176
Primary Spinal Column Tumors	176
Extradural, Intradural, and Intramedullary Primary Tumors	183
Metastatic Spinal Tumors	185
Conclusion	187
References.	190
15 Special Considerations for Intracranial Tumors	191
Pascal O. Zinn and Ganesh Rao	
Introduction.	191
Perioperative Considerations	191
Intracranial Tumor Pathology	192
Intra-Axial Tumors	192
Extra-Axial Tumors	193
Skull Base Tumors	194
Comorbidities	194
Positioning for Common Approaches: Tricks of the Trade and Pitfalls	195
Supine Position	195

Trans-Sphenoidal	196
Frontal/Trans-Frontal Sinus Approach	197
Orbito-Zygomatic and Pterional Approaches	197
Temporal	198
Lateral Position	198
Retrosigmoid	199
Far Lateral	199
Parieto-Occipital	199
Prone and Sitting Position	200
Suboccipital	200
Awake Craniotomies	201
Summary	202
References	202
16 Special Considerations for Pediatric Positioning for Neurosurgical Procedures	205
Michael DeCuyper	
Introduction	205
Age Terminology	205
General Principles of Pediatric Positioning	206
Thermal Homeostasis	206
Head Immobilization Devices and Pediatric Patients	207
Prone Positioning in Children	207
Special Circumstances in Pediatrics	208
Neonatal Surgery	208
Hydrocephalus and Shunt Procedures	209
Pediatric Brain Tumors	210
Surgery for Craniofacial Abnormalities	210
Epilepsy Surgery	210
Trauma	211
Spine Surgery	211
Conclusion	211
References	211
17 Comorbidities and Positioning: Morbid Obesity and Multiple Trauma	213
Emily P. Sieg and Shelly D. Timmons	
The Polytrauma Patient	213
Case 1 Illustration	213
Positioning for Simultaneous Surgeries	213
Complications	218
The Morbidly Obese Patient	218
Case 2 Presentation	218
Positioning of the Morbidly Obese Patient	218
Complications	220
References	221

18 Comorbidities and Positioning: Pregnancy	223
Thomas Scott Guyton	
Maternal Weight Gain	223
Physiological Changes During Pregnancy	223
Aortocaval Compression	224
Importance of Aortocaval Compression	225
How to Reduce Aortocaval Compression in the Supine Position ..	226
Fetal Evaluation	226
Estimate of Fetal Gestational Age	226
Evaluation of the Fetus In Utero	227
Timing of Surgery	228
Diagnostic Imaging	229
Prone Position	229
Lateral Position	231
Supine	232
The Sitting Position	232
Antibiotic Prophylaxis	233
Seizure Prophylaxis	233
Treatment of Intracranial Pressure	233
Tocolysis	234
Neurosurgery with Fetus In Utero	234
Neurosurgery with Cesarean Section	235
Conclusions	235
References	235
19 Postoperative Positioning in the Neurointensive Care Unit ...	241
Abhi Pandhi and Lucas Elijovich	
Introduction	241
Review of Basic Positions and General Principles	241
Transfer of Critically Ill Neurosurgical Patients	243
Neurosurgical Procedures and Intensive Care Unit Positioning ...	243
Neuroendovascular Surgery	244
Mechanical Thrombectomy (MT): Autoregulation and Cerebral Blood Flow	244
Endovascular Aneurysm Coiling and Microsurgical Clipping in Subarachnoid Hemorrhage, Positioning for Optimizing Cerebral Blood Flow and Intracranial Pressure	244
Craniectomy for Ischemic Stroke, Intracranial Hemorrhage, and Traumatic Brain Injury: Positioning Considerations for Intracranial Pressure Management	245
Complex Spine Surgery: Positioning Considerations for Postoperative Airway Management and Cerebrospinal Fluid Leakage	245
Cranial and Skull Base Surgery Tumor Surgery: Positioning Considerations for Optimizing Intracranial Pressure and Management of Brain Edema	246
Conclusions	247
References	247