

TABLE OF CONTENTS



Part I: Congenital and Genetic Disorders

SECTION 1: CONGENITAL

NORMAL ANATOMICAL VARIATIONS

- 4 **Normal Anatomy**
Jeffrey S. Ross, MD
- 10 **Measurement Techniques**
Jeffrey S. Ross, MD
- 16 **MR Artifacts**
Kevin R. Moore, MD
- 22 **Normal Variant**
Kevin R. Moore, MD
- 26 **Craniovertebral Junction Variants**
Kevin R. Moore, MD
- 30 **Ponticulus Posticus**
Kevin R. Moore, MD
- 32 **Ossiculum Terminale**
Kevin R. Moore, MD
- 34 **Conjoined Nerve Roots**
Kevin R. Moore, MD
- 38 **Limbus Vertebra**
Kevin R. Moore, MD
- 42 **Filum Terminale Fibrolipoma**
Kevin R. Moore, MD
- 44 **Bone Island**
Kevin R. Moore, MD
- 46 **Ventriculus Terminalis**
Kevin R. Moore, MD

CHIARI DISORDERS

- 50 **Chiari 0**
Kevin R. Moore, MD
- 52 **Chiari 1**
Kevin R. Moore, MD
- 56 **Complex Chiari**
Kevin R. Moore, MD
- 58 **Chiari 2**
Kevin R. Moore, MD
- 62 **Chiari 3**
Kevin R. Moore, MD

ABNORMALITIES OF NEURULATION

- 64 **Approach to Spine and Spinal Cord Development**
Kevin R. Moore, MD
- 72 **Myelomeningocele**
Kevin R. Moore, MD

- 76 **Lipomyelomeningocele**
Kevin R. Moore, MD
- 80 **Lipoma**
Kevin R. Moore, MD
- 84 **Dorsal Dermal Sinus**
Kevin R. Moore, MD
- 88 **Simple Coccygeal Dimple**
Kevin R. Moore, MD
- 92 **Dermoid Cysts**
Kevin R. Moore, MD
- 96 **Epidermoid Cysts**
Kevin R. Moore, MD

ANOMALIES OF THE CAUDAL CELL MASS

- 100 **Tethered Spinal Cord**
Kevin R. Moore, MD
- 104 **Segmental Spinal Dysgenesis**
Kevin R. Moore, MD
- 108 **Caudal Regression Syndrome**
Kevin R. Moore, MD
- 112 **Terminal Myelocystocele**
Kevin R. Moore, MD
- 116 **Anterior Sacral Meningocele**
Kevin R. Moore, MD
- 120 **Sacral Extradural Arachnoid Cyst**
Kevin R. Moore, MD
- 124 **Sacrococcygeal Teratoma**
Kevin R. Moore, MD

ANOMALIES OF NOTOCHORD AND VERTEBRAL FORMATION

- 128 **Craniovertebral Junction Embryology**
Kevin R. Moore, MD
- 132 **Paracondylar Process**
Jeffrey S. Ross, MD
- 134 **Split Atlas**
Kevin R. Moore, MD
- 136 **Klippel-Feil Spectrum**
Kevin R. Moore, MD
- 140 **Failure of Vertebral Formation**
Kevin R. Moore, MD
- 144 **Vertebral Segmentation Failure**
Kevin R. Moore, MD
- 148 **Diastematomyelia**
Kevin R. Moore, MD
- 152 **Partial Vertebral Duplication**
Kevin R. Moore, MD
- 154 **Incomplete Fusion, Posterior Element**
Kevin R. Moore, MD

TABLE OF CONTENTS

- 156 **Neurenteric Cyst**
Kevin R. Moore, MD

DEVELOPMENTAL ABNORMALITIES

- 160 **Os Odontoideum**
Kevin R. Moore, MD
- 164 **Lateral Meningocele**
Kevin R. Moore, MD
- 168 **Dorsal Spinal Meningocele**
Kevin R. Moore, MD
- 172 **Dural Dysplasia**
Kevin R. Moore, MD

GENETIC DISORDERS

- 176 **Neurofibromatosis Type 1**
Kevin R. Moore, MD
- 180 **Neurofibromatosis Type 2**
Jeffrey S. Ross, MD
- 186 **Achondroplasia**
Bryson Borg, MD
- 190 **Mucopolysaccharidoses**
Bryson Borg, MD
- 194 **Sickle Cell Disease**
Bryson Borg, MD
- 198 **Osteogenesis Imperfecta**
Carl Mellow, MD
- 202 **Tuberous Sclerosis**
Jeffrey S. Ross, MD
- 206 **Osteopetrosis**
Kevin R. Moore, MD
- 208 **Gaucher Disease**
Kevin R. Moore, MD
- 210 **Ochronosis**
Kevin R. Moore, MD
- 212 **Connective Tissue Disorders**
Kevin R. Moore, MD
- 216 **Spondyloepiphyseal Dysplasia**
Kevin R. Moore, MD
- 220 **Thanatophoric Dwarfism**
Kevin R. Moore, MD

SECTION 2: SCOLIOSIS AND KYPHOSIS

- 224 **Introduction to Scoliosis**
Julia Crim, MD
- 228 **Scoliosis**
Kevin R. Moore, MD
- 232 **Kyphosis**
Kevin R. Moore, MD
- 234 **Degenerative Scoliosis**
Jeffrey S. Ross, MD
- 238 **Flat Back Syndrome**
Lubdha M. Shah, MD
- 240 **Scoliosis Instrumentation**
Lubdha M. Shah, MD

Part II: Trauma

SECTION 1: VERTEBRAL COLUMN, DISCS, AND PARASPINAL MUSCLE

- 246 **Fracture Classification**
Jeffrey S. Ross, MD
- 252 **Atlantooccipital Dislocation**
Julia Crim, MD
- 256 **Ligamentous Injury**
Bryson Borg, MD and Jeffrey S. Ross, MD
- 260 **Occipital Condyle Fracture**
Bryson Borg, MD and Jeffrey S. Ross, MD
- 264 **Jefferson C1 Fracture**
Bryson Borg, MD
- 268 **Atlantoaxial Rotatory Fixation**
Jeffrey S. Ross, MD
- 274 **Odontoid C2 Fracture**
Bryson Borg, MD and Jeffrey S. Ross, MD
- 278 **Burst C2 Fracture**
Bryson Borg, MD
- 282 **Hangman's C2 Fracture**
Bryson Borg, MD
- 286 **Apophyseal Ring Fracture**
Kevin R. Moore, MD
- 290 **Cervical Hyperflexion Injury**
Jeffrey S. Ross, MD
- 296 **Cervical Hyperextension Injury**
Jeffrey S. Ross, MD
- 300 **Cervical Hyperextension-Rotation Injury**
Bryson Borg, MD
- 302 **Cervical Burst Fracture**
Jeffrey S. Ross, MD
- 306 **Cervical Hyperflexion-Rotation Injury**
Bryson Borg, MD
- 308 **Cervical Lateral Flexion Injury**
Jeffrey S. Ross, MD
- 310 **Cervical Posterior Column Injury**
Bryson Borg, MD and Jeffrey S. Ross, MD
- 312 **Traumatic Disc Herniation**
Bryson Borg, MD
- 314 **Thoracic and Lumbar Burst Fracture**
Julia Crim, MD and Jeffrey S. Ross, MD
- 318 **Facet-Lamina Thoracolumbar Fracture**
Bryson Borg, MD
- 320 **Fracture Dislocation**
Bryson Borg, MD
- 322 **Chance Fracture**
Julia Crim, MD and Jeffrey S. Ross, MD
- 328 **Thoracic and Lumbar Hyperextension Injury**
Bryson Borg, MD and Jeffrey S. Ross, MD
- 330 **Anterior Compression Fracture**
Julia Crim, MD
- 334 **Lateral Compression Fracture**
Julia Crim, MD and Jeffrey S. Ross, MD
- 336 **Lumbar Facet-Posterior Fracture**
Bryson Borg, MD and Jeffrey S. Ross, MD
- 338 **Sacral Traumatic Fracture**
Julia Crim, MD

TABLE OF CONTENTS

- 342 **Pedicle Stress Fracture**
Bryson Borg, MD and Jeffrey S. Ross, MD
- 346 **Sacral Insufficiency Fracture**
Bryson Borg, MD

SECTION 2: CORD, DURA, AND VESSELS

- 352 **SCIWORA**
Kevin R. Moore, MD
- 356 **Post-Traumatic Syrinx**
Jeffrey S. Ross, MD
- 360 **Presyrinx Edema**
Jeffrey S. Ross, MD
- 364 **Spinal Cord Contusion-Hematoma**
Bryson Borg, MD and Jeffrey S. Ross, MD
- 370 **Idiopathic Spinal Cord Herniation**
Jeffrey S. Ross, MD
- 374 **Central Spinal Cord Syndrome**
Bryson Borg, MD and Jeffrey S. Ross, MD
- 378 **Traumatic Dural Tear**
Bryson Borg, MD and Jeffrey S. Ross, MD
- 382 **Traumatic Epidural Hematoma**
Kevin R. Moore, MD
- 386 **Traumatic Subdural Hematoma**
Bryson Borg, MD
- 388 **Vascular Injury, Cervical**
Bryson Borg, MD and Jeffrey S. Ross, MD
- 394 **Traumatic Arteriovenous Fistula**
Bryson Borg, MD
- 396 **Wallerian Degeneration**
Jeffrey S. Ross, MD

Part III: Degenerative Diseases and Arthritides

SECTION 1: DEGENERATIVE DISEASES

- 400 **Nomenclature of Degenerative Disc Disease**
Jeffrey S. Ross, MD
- 404 **Degenerative Disc Disease**
Jeffrey S. Ross, MD
- 410 **Degenerative Endplate Changes**
Jeffrey S. Ross, MD
- 414 **Degenerative Arthritis of the CVJ**
Cheryl A. Petersilge, MD, MBA
- 418 **Disc Bulge**
Jeffrey S. Ross, MD
- 422 **Anular Fissure, Intervertebral Disc**
Jeffrey S. Ross, MD
- 426 **Cervical Intervertebral Disc Herniation**
Jeffrey S. Ross, MD
- 432 **Thoracic Intervertebral Disc Herniation**
Jeffrey S. Ross, MD
- 436 **Lumbar Intervertebral Disc Herniation**
Jeffrey S. Ross, MD
- 442 **Intervertebral Disc Extrusion, Foraminal**
Jeffrey S. Ross, MD
- 446 **Cervical Facet Arthropathy**
Jeffrey S. Ross, MD

- 450 **Lumbar Facet Arthropathy**
Jeffrey S. Ross, MD
- 454 **Facet Joint Synovial Cyst**
Jeffrey S. Ross, MD
- 460 **Baastrup Disease**
Jeffrey S. Ross, MD
- 464 **Bertolotti Syndrome**
Jeffrey S. Ross, MD
- 466 **Schmorl Node**
Jeffrey S. Ross, MD and Kevin R. Moore, MD
- 470 **Scheuermann Disease**
Jeffrey S. Ross, MD and Kevin R. Moore, MD
- 474 **Acquired Lumbar Central Stenosis**
Jeffrey S. Ross, MD
- 478 **Congenital Spinal Stenosis**
Jeffrey S. Ross, MD
- 484 **Cervical Spondylosis**
Jeffrey S. Ross, MD
- 490 **DISH**
Jeffrey S. Ross, MD
- 494 **OPLL**
Jeffrey S. Ross, MD
- 498 **Ossification Ligamentum Flavum**
Jeffrey S. Ross, MD
- 502 **Periodontoid Pseudotumor**
Jeffrey S. Ross, MD

SECTION 2: SPONDYLOLISTHESIS AND SPONDYLOLYSIS

- 508 **Spondylolisthesis**
Jeffrey S. Ross, MD
- 512 **Spondylolysis**
Jeffrey S. Ross, MD
- 516 **Instability**
Jeffrey S. Ross, MD

SECTION 3: INFLAMMATORY, CRYSTALLINE, AND MISCELLANEOUS ARTHRITIDES

- 522 **Adult Rheumatoid Arthritis**
Jeffrey S. Ross, MD
- 528 **Juvenile Idiopathic Arthritis**
Julia Crim, MD and Jeffrey S. Ross, MD
- 534 **Spondyloarthropathy**
Jeffrey S. Ross, MD
- 540 **Neurogenic (Charcot) Arthropathy**
Julia Crim, MD
- 544 **Hemodialysis Spondyloarthropathy**
Julia Crim, MD and Jeffrey S. Ross, MD
- 546 **Ankylosing Spondylitis**
Jeffrey S. Ross, MD
- 550 **CPPD**
Jeffrey S. Ross, MD
- 556 **Gout**
Julia Crim, MD
- 558 **Longus Colli Calcific Tendinitis**
Julia Crim, MD and Jeffrey S. Ross, MD

TABLE OF CONTENTS

Part IV: Infection and Inflammatory Disorders

SECTION 1: INFECTIONS

- 564 **Pathways of Spread**
Jeffrey S. Ross, MD
- 568 **Spinal Meningitis**
Lubdha M. Shah, MD
- 572 **Pyogenic Osteomyelitis**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD
- 578 **Tuberculous Osteomyelitis**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD
- 584 **Fungal and Miscellaneous Osteomyelitis**
Kevin R. Moore, MD
- 586 **Osteomyelitis, C1-C2**
Lubdha M. Shah, MD
- 590 **Brucellar Spondylitis**
Lubdha M. Shah, MD and Kevin R. Moore, MD
- 592 **Septic Facet Joint Arthritis**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD
- 598 **Paraspinal Abscess**
Lubdha M. Shah, MD
- 602 **Epidural Abscess**
Lubdha M. Shah, MD
- 608 **Subdural Abscess**
Lubdha M. Shah, MD and Kevin R. Moore, MD
- 612 **Abscess, Spinal Cord**
Jeffrey S. Ross, MD
- 616 **Viral Myelitis**
Lubdha M. Shah, MD and Kevin R. Moore, MD
- 620 **HIV Myelitis**
Lubdha M. Shah, MD
- 624 **Syphilitic Myelitis**
Jeffrey S. Ross, MD
- 626 **Opportunistic Infections**
Lubdha M. Shah, MD and Kevin R. Moore, MD
- 630 **Echinococcosis**
Lubdha M. Shah, MD
- 634 **Schistosomiasis**
Lubdha M. Shah, MD
- 638 **Cysticercosis**
Lubdha M. Shah, MD

SECTION 2: INFLAMMATORY AND AUTOIMMUNE DISORDERS

- 644 **Acute Transverse Myelopathy**
Jeffrey S. Ross, MD
- 648 **Idiopathic Acute Transverse Myelitis**
Kevin R. Moore, MD
- 652 **Multiple Sclerosis**
Lubdha M. Shah, MD and Kevin R. Moore, MD
- 656 **Neuromyelitis Optica**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD
- 660 **ADEM**
Jeffrey S. Ross, MD
- 664 **Guillain-Barré Syndrome**
Lubdha M. Shah, MD and Kevin R. Moore, MD

- 668 **CIDP**
Jeffrey S. Ross, MD
- 672 **Sarcoidosis**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD
- 678 **Subacute Combined Degeneration**
Lubdha M. Shah, MD
- 682 **Chronic Recurrent Multifocal Osteomyelitis**
Jeffrey S. Ross, MD
- 684 **Grisel Syndrome**
Cheryl A. Petersilge, MD, MBA
- 686 **Paraneoplastic Myelopathy**
Jeffrey S. Ross, MD

Part V: Neoplasms, Cysts, and Other Masses

SECTION 1: NEOPLASMS

INTRODUCTION AND OVERVIEW

- 690 **Spread of Neoplasms**
Jeffrey S. Ross, MD

EXTRADURAL

- 694 **Blastic Osseous Metastases**
Bryson Borg, MD
- 698 **Lytic Osseous Metastases**
Bryson Borg, MD
- 702 **Hemangioma**
Bryson Borg, MD
- 706 **Osteoid Osteoma**
Julia Crim, MD and Jeffrey S. Ross, MD
- 712 **Osteoblastoma**
Kevin R. Moore, MD
- 716 **Aneurysmal Bone Cyst**
Jeffrey S. Ross, MD
- 720 **Giant Cell Tumor**
Jeffrey S. Ross, MD
- 724 **Osteochondroma**
Bryson Borg, MD and Kevin R. Moore, MD
- 728 **Chondrosarcoma**
Bryson Borg, MD and Kevin R. Moore, MD
- 732 **Osteosarcoma**
Julia Crim, MD and Kevin R. Moore, MD
- 736 **Chordoma**
Bryson Borg, MD and Kevin R. Moore, MD
- 742 **Ewing Sarcoma**
Julia Crim, MD
- 746 **Lymphoma**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD
- 752 **Leukemia**
Lubdha M. Shah, MD
- 756 **Plasmacytoma**
Lubdha M. Shah, MD and Kevin R. Moore, MD
- 760 **Multiple Myeloma**
Lubdha M. Shah, MD
- 764 **Neuroblastic Tumor**
Lubdha M. Shah, MD and Kevin R. Moore, MD

TABLE OF CONTENTS

768 **Langerhans Cell Histiocytosis**
Lubdha M. Shah, MD and Kevin R. Moore, MD

772 **Angiolipoma**
Lubdha M. Shah, MD and Kevin R. Moore, MD

INTRADURAL EXTRAMEDULLARY

776 **Schwannoma**
Bryson Borg, MD and Kevin R. Moore, MD

780 **Meningioma**
Bryson Borg, MD and Jeffrey S. Ross, MD

786 **Solitary Fibrous Tumor/Hemangiopericytoma**
Bryson Borg, MD and Jeffrey S. Ross, MD

790 **Neurofibroma**
Bryson Borg, MD and Kevin R. Moore, MD

794 **Malignant Nerve Sheath Tumors**
Bryson Borg, MD and Jeffrey S. Ross, MD

798 **Metastases, CSF Disseminated**
Bryson Borg, MD

802 **Paraganglioma**
Bryson Borg, MD

INTRAMEDULLARY

806 **Astrocytoma**
Lubdha M. Shah, MD and Kevin R. Moore, MD

810 **Cellular Ependymoma**
Kevin R. Moore, MD

814 **Myxopapillary Ependymoma**
Kevin R. Moore, MD

818 **Hemangioblastoma**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD

824 **Spinal Cord Metastases**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD

828 **Primary Melanocytic Neoplasms/Melanocytoma**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD

830 **Ganglioglioma**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD

SECTION 2: NONNEOPLASTIC CYSTS AND TUMOR MIMICS

CYSTS

834 **CSF Flow Artifact**
Lubdha M. Shah, MD and Kevin R. Moore, MD

836 **Meningeal Cyst**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD

842 **Perineural Root Sleeve Cyst**
Kevin R. Moore, MD

846 **Syringomyelia**
Kevin R. Moore, MD

NONNEOPLASTIC MASSES AND TUMOR MIMICS

850 **Epidural Lipomatosis**
Julia Crim, MD

852 **Normal Fatty Marrow Variants**
Julia Crim, MD

854 **Fibrous Dysplasia**
Julia Crim, MD

856 **Kümmell Disease**
Julia Crim, MD and Kevin R. Moore, MD

858 **Hirayama Disease**
Jeffrey S. Ross, MD

860 **IgG4-Related Disease/Hypertrophic Pachymeningitis**
Jeffrey S. Ross, MD

SECTION 3: VASCULAR AND SYSTEMIC DISORDERS

VASCULAR LESIONS

866 **Vascular Anatomy**
Jeffrey S. Ross, MD

872 **Persistent First Intersegmental Artery**
Jeffrey S. Ross, MD

874 **Persistent Hypoglossal Artery**
Jeffrey S. Ross, MD

876 **Persistent Proatlantal Artery**
Jeffrey S. Ross, MD

878 **Type 1 Vascular Malformation (dAVF)**
Jeffrey S. Ross, MD

884 **Type 2 Arteriovenous Malformation (AVM)**
Jeffrey S. Ross, MD

888 **Type 3 Arteriovenous Malformation (AVM)**
Jeffrey S. Ross, MD

892 **Type 4 Vascular Malformation (AVF)**
Jeffrey S. Ross, MD

896 **Conus Arteriovenous Malformation**
Jeffrey S. Ross, MD

900 **Posterior Fossa Dural Fistula With Intraspinal Drainage**
Jeffrey S. Ross, MD

904 **Cavernous Malformation**
Jeffrey S. Ross, MD

908 **Spinal Artery Aneurysm**
Jeffrey S. Ross, MD

910 **Spinal Cord Infarction**
Jeffrey S. Ross, MD

914 **Subarachnoid Hemorrhage**
Jeffrey S. Ross, MD

918 **Spontaneous Epidural Hematoma**
Jeffrey S. Ross, MD

924 **Subdural Hematoma**
Jeffrey S. Ross, MD

928 **Superficial Siderosis**
Jeffrey S. Ross, MD

932 **Hematomyelia/Nontraumatic Cord Hemorrhage**
Jeffrey S. Ross, MD

936 **Bow Hunter Syndrome**
Jeffrey S. Ross, MD

938 **Vertebral Artery Dissection**
Lubdha M. Shah, MD

SPINAL MANIFESTATIONS OF SYSTEMIC DISEASES

944 **Osteoporosis**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD

948 **Paget Disease**
Lubdha M. Shah, MD

TABLE OF CONTENTS

- 952 **Hyperparathyroidism**
Julia Crim, MD
- 954 **Renal Osteodystrophy**
Julia Crim, MD and Jeffrey S. Ross, MD
- 956 **Hyperplastic Vertebral Marrow**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD
- 960 **Myelofibrosis**
Julia Crim, MD and Jeffrey S. Ross, MD
- 962 **Bone Infarction**
Jeffrey S. Ross, MD
- 964 **Extramedullary Hematopoiesis**
Lubdha M. Shah, MD
- 968 **Tumoral Calcinosis**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD

Part VI: Peripheral Nerve and Plexus

SECTION 1: PLEXUS AND PERIPHERAL NERVE LESIONS

- 974 **Normal Plexus and Nerve Anatomy**
Kevin R. Moore, MD
- 980 **Superior Sulcus Tumor**
Kevin R. Moore, MD
- 984 **Thoracic Outlet Syndrome**
Kevin R. Moore, MD
- 988 **Muscle Denervation**
Julia Crim, MD
- 990 **Brachial Plexus Traction Injury**
Kevin R. Moore, MD
- 994 **Idiopathic Brachial Plexus Neuritis**
Julia Crim, MD and Kevin R. Moore, MD
- 998 **Traumatic Neuroma**
Julia Crim, MD and Kevin R. Moore, MD
- 1002 **Radiation Plexopathy**
Kevin R. Moore, MD
- 1006 **Peripheral Nerve Sheath Tumor**
Julia Crim, MD and Kevin R. Moore, MD
- 1010 **Peripheral Neurolymphomatosis**
Kevin R. Moore, MD
- 1012 **Hypertrophic Neuropathy**
Kevin R. Moore, MD
- 1016 **Femoral Neuropathy**
Kevin R. Moore, MD
- 1018 **Ulnar Neuropathy**
Kevin R. Moore, MD
- 1022 **Suprascapular Neuropathy**
Julia Crim, MD
- 1026 **Median Neuropathy**
Kevin R. Moore, MD
- 1028 **Common Peroneal Neuropathy**
Kevin R. Moore, MD
- 1030 **Tibial Neuropathy**
Julia Crim, MD

Part VII: Spine Postprocedural Imaging

SECTION 1: POSTOPERATIVE IMAGING AND COMPLICATIONS

- 1036 **Surgical Approaches**
Jeffrey S. Ross, MD
- 1040 **Normal Postoperative Change**
Bryson Borg, MD and Jeffrey S. Ross, MD
- 1046 **Postoperative Spinal Complications**
Bryson Borg, MD and Jeffrey S. Ross, MD
- 1052 **Myelography Complications**
Bryson Borg, MD and Jeffrey S. Ross, MD
- 1056 **Vertebroplasty Complications**
Bryson Borg, MD and Jeffrey S. Ross, MD
- 1060 **Failed Back Surgery Syndrome**
Jeffrey S. Ross, MD
- 1064 **Recurrent Disc Herniation**
Jeffrey S. Ross, MD
- 1068 **Peridural Fibrosis**
Jeffrey S. Ross, MD
- 1072 **Arachnoiditis/Adhesions**
Bryson Borg, MD and Jeffrey S. Ross, MD
- 1078 **Arachnoiditis Ossificans**
Bryson Borg, MD
- 1080 **Accelerated Degeneration**
Jeffrey S. Ross, MD
- 1084 **Postoperative Infection**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD
- 1088 **Pseudomeningocele**
Jeffrey S. Ross, MD
- 1094 **CSF Leakage Syndrome**
Bryson Borg, MD
- 1100 **Postsurgical Deformity**
Jeffrey S. Ross, MD

SECTION 2: HARDWARE

- 1106 **Metal Artifact**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD
- 1110 **Occipitocervical Fixation**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD
- 1112 **Plates and Screws**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD
- 1116 **Cages**
Lubdha M. Shah, MD
- 1118 **Interbody Fusion Devices**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD
- 1122 **Interspinous Spacing Devices**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD
- 1126 **Cervical Artificial Disc**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD
- 1130 **Lumbar Artificial Disc**
Lubdha M. Shah, MD and Jeffrey S. Ross, MD
- 1134 **Hardware Failure**
Jeffrey S. Ross, MD and Lubdha M. Shah, MD
- 1140 **Bone Graft Complications**
Jeffrey S. Ross, MD

TABLE OF CONTENTS

1144 rhBMP-2 Complications

Jeffrey S. Ross, MD

1148 Heterotopic Bone Formation

Jeffrey S. Ross, MD

**SECTION 3: POST RADIATION AND
CHEMOTHERAPY COMPLICATIONS**

1154 Radiation Myelopathy

Kevin R. Moore, MD

1158 Post-Irradiation Vertebral Marrow

Kevin R. Moore, MD

1162 Anterior Lumbar Radiculopathy

Kevin R. Moore, MD