

## Table of contents

<b>1</b>	<b>Methods for identifying and evaluating quality spine measurements</b>	<b>1</b>
<b>2</b>	<b>How the spine measurements are displayed in this book</b>	<b>5</b>
<b>3</b>	<b>Clinical measurements</b>	<b>9</b>
<b>3.1</b>	<b>Range of motion</b>	<b>9</b>
3.1.1	Types	16
3.1.2	Cervical spine-specific	20
3.1.3	Thoracolumbar spine-specific	23
<b>3.2</b>	<b>Neurological measurements</b>	<b>31</b>
3.2.1	Motor	44
3.2.2	Sensory	50
3.2.3	Tone and reflexes	52
3.2.4	Autonomic	54
3.2.5	Walking	55
3.2.6	Composite scales	62
<b>3.3</b>	<b>Strength measurements</b>	<b>69</b>
3.3.1	Isometric testing	76
3.3.2	Isokinetic dynamometer	77
3.3.3	Isodynamic testing	78
3.3.4	Other strength tests	79
<b>3.4</b>	<b>Body composition measurements</b>	<b>81</b>
3.4.1	Osteoporosis	96
3.4.2	Obesity	100

<b>4</b>	<b>Laboratory measurements</b>	<b>113</b>
<b>4.1</b>	<b>Blood/urine/plasma/serum measurements</b>	<b>113</b>
4.1.1	Infection measurements	118
4.1.2	Rheumatological measurements	126
4.1.3	Clotting function measurements	133
4.1.4	Hepatorenal function measurements	139
4.1.5	Comprehensive metabolic panel	148
4.1.6	Bone mineral metabolism	149
4.1.7	Toxicology screens	162
4.1.8	Oncologic bone disease	165
<b>4.2</b>	<b>Electrophysiological measurements</b>	<b>169</b>
4.2.1	Electromyography (EMG)	178
4.2.2	Evoked potentials	180
4.2.3	Nerve conduction velocity (NCV)	184
<b>4.3</b>	<b>Pulmonary measurements</b>	<b>193</b>
4.3.1	Lung mechanics	200
4.3.2	Gas exchange	204
4.3.3	Regional lung function	208
4.3.4	Respiratory muscle function	210
4.3.5	Pulmonary hemodynamics	212
4.3.6	Pulmonary host defenses	213
4.3.7	Response to exercise	214
4.3.8	Respiratory function during sleep	216

---

<b>5</b>	<b>Radiographic measurements</b>	<b>219</b>
<b>5.1</b>	<b>Fractures/dislocations</b>	<b>219</b>
5.1.1	Craniocervical junction	226
5.1.2	Subaxial cervical spine	238
5.1.3	Thoracolumbar and lumbosacral spine	243
<b>5.2</b>	<b>Diseases</b>	<b>251</b>
5.2.1	Cervical spine alignment	258
5.2.2	Cervical spine degenerative measurements	261
5.2.3	Cervical spine in kyphosis and segmental instability associated with cervical spondylotic myelopathy	273
5.2.4	Cervical range of motion	277
5.2.5	Assessment of cervical fusion	282
5.2.6	Motion adjacent to fusion	284
5.2.7	Progression of ossification of the posterior longitudinal ligament (OPLL)	288
5.2.8	Lumbar spine normal alignment	291
5.2.9	Lumbar range of motion	293
5.2.10	Spinal-pelvic sagittal balance	297
5.2.11	Lumbar degenerative measurements	301
5.2.12	Congenital stenosis measurements	305
5.2.13	Vertebral body collapse in metastases of the thoracic and lumbar spine	307
5.2.14	Infection measures—spine at risk in tuberculosis	308
5.2.15	Deformity and kyphosis secondary to infection	312
5.2.16	Osteoporosis measurements	314

---

---

<b>5.3</b>	<b>Deformity</b> .....	<b>319</b>
5.3.1	Sagittal spinal alignment (cervical angles) .....	328
5.3.2	Sagittal spinal alignment (thoracic angles) .....	330
5.3.3	Sagittal spinal alignment (lumbar angles) .....	332
5.3.4	Sagittal spinal alignment (pelvic alignment) .....	334
5.3.5	Sagittal spinal alignment (global spinal alignment) .....	337
5.3.6	Coronal spinal alignment (cervical angles) .....	342
5.3.7	Coronal spinal alignment (thoracic angles) .....	344
5.3.8	Coronal spinal alignment (lumbar angles) .....	346
5.3.9	Coronal spinal alignment (lumbosacral related angles) .....	348
5.3.10	Coronal spinal alignment (pelvic alignment) .....	350
5.3.11	Coronal spinal alignment (global spinal alignment) .....	352
5.3.12	Axial spinal alignment (rotatory deformity) .....	356
	<b>List of assessed measurements</b> .....	<b>358</b>
	<b>Glossary of terms and abbreviations</b> .....	<b>366</b>