

Contents

1	Normal Bone Marrow: In Utero Through the Adult Years	1
1.1	Hematopoiesis	1
1.2	Development of Bone and Bone Marrow	1
1.3	Anatomy and Physiology	2
1.4	MRI of the Normal Appendicular Skeleton	6
1.5	MRI of Normal Axial Skeleton	40
	References	62
2	Posttreatment-Related Marrow Changes	63
2.1	Radiation Therapy	63
2.1.1	Radiation Complications	70
2.2	Chemotherapy	76
2.2.1	Lymphoma/Leukemia	78
2.2.2	Myeloma	83
2.2.3	GCSF	87
2.3	Postoperative	90
	References	97
3	Neoplastic Bone Marrow Infiltration	99
3.1	Plasma Cell Dyscrasias	99
3.2	Lymphoma	116
3.3	Leukemia	124
3.4	Myeloproliferative Neoplasms	131
3.4.1	Myelodysplastic Syndromes	131
3.4.2	Polycythemia Vera	133
3.4.3	Myelofibrosis	134
3.5	Metastatic Disease	136
	References	141
4	Anemias	143
4.1	Introduction	143
4.2	Physiologic Red Marrow Hyperplasia	143
4.3	Bone Marrow Failure	145
4.4	Hemoglobinopathies and Thalassemias	147
	References	155
5	Miscellaneous Bone Marrow Disorders	157
5.1	Introduction	157
5.2	Renal Osteodystrophy	157
5.3	Histiocytosis	162
5.4	Mastocytosis	168
5.5	Paget Disease	169
5.6	Serous Atrophy of the Bone Marrow	174
5.7	Gaucher Disease	176

5.8 Osteopetrosis	180
5.9 Sarcoidosis	181
5.10 Infection	183
5.11 Chronic Recurrent Multifocal Osteomyelitis	185
5.12 Osteonecrosis	187
5.13 Rheumatological Conditions	190
5.14 Transient Bone Marrow Edema Syndrome	192
References	194
Index	195