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## Introduction

2.2 Medico-legal fields of application 2.2.1 Unaccompanied children in Europe; 2.2.2 Unaccompanied children in the USA; 2.3 Criminal law; 2.4 Adoptions; 2.5 Ethical issues; 2.6 Conclusions; References; CHAPTER 3: Endocrinology, Puberty, and Disorders of Pubertal Development; 3.1 Introduction; 3.2 Alterations of the time of onset of puberty; 3.3 Early puberty; 3.4 Precocious puberty; 3.4.1 Clinical and diagnostic evaluation; 3.4.2 Therapy; 3.5 Late puberty; 3.6 Delayed puberty; 3.6.1 Clinical and diagnostic evaluation; 3.6.2 Therapy; 3.6.3 Imaging; References

CHAPTER 4: MR Assessment of Skeletal Age in Healthy Children 4.1 Introduction; 4.2 State of the art of age estimation methods; 4.2.1 MR skeletal imaging of the wrist and hand; 4.3 Conclusions; References;

CHAPTER 5: Maturation of Individual Bones of the Hand and Wrist in Healthy Children; 5.1 Grading system of MR images to assess skeletal estimation; 5.2 MR images of maturation of individual bones; 5.3 Details of MRI maturation scoring system; 5.4 Notes on the use of the bone maturation tables; 5.5 Conclusions; References; CHAPTER 6:

Musculoskeletal Findings in Young Athletes; 6.1 Introduction 6.2 Athletics associated with delayed bone aging 6.3 Athletics associated with premature (advanced) bone aging; 6.4 Athletics associated with specific forms of overuse trauma; References; CHAPTER 7: Bone Marrow Maturation in Healthy and Diseased States; 7.1 Introduction; 7.2 Healthy bone marrow and the role of magnetic resonance; 7.3 Bone marrow disorders; 7.3.1 Bone marrow reconversion; 7.3.2 Bone marrow infiltration/replacement/deposition; 7.3.3 Bone marrow depletion/failure; References; CHAPTER 8: Nutrition and Growth; 8.1 Introduction; 8.2 Anorexia nervosa; 8.3 Obesity; References

CHAPTER 9: MRI Skeletal Age Estimation in Celiac Disease 9.1 General aspects; 9.2 Therapy; 9.3 Imaging; References; CHAPTER 10: Growth Failure and Pediatric Inflammatory Bowel Disease; 10.1 General aspects; 10.1.1 Disruption of the GH-IGF-1 axis; 10.1.2 IGF-1-independent mechanisms; 10.1.3 Tumor necrosis factor; 10.1.4 Chronic corticosteroid therapy; 10.2 Imaging of individuals with childhood onset IBD; References; CHAPTER 11: Adult Bone Diseases That Begin in Childhood; 11.1 General aspects; 11.2 Imaging; References; CHAPTER 12: Skeletal Findings in Neurometabolic Disease; 12.1 Introduction 12.2 Phenylketonuria

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### Sommario/riassunto

Text-Atlas of Skeletal Age Determination: MRI of the Hand and Wrist in Children collects in a single volume all that is currently known and applicable about the use of magnetic resonance imaging (MRI) for the assessment of bone age. The radiographic examination of the hand/wrist was initially used to study skeletal development, correlating skeletal and chronological age in order to verify potential growth and whether a need for intervention was necessary. In recent years, the reasons for this examination have expanded beyond assessment of development, into such are

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