
Contents

Pharmacologic Manipulation of Bone Remodelling and Calcium Homeostasis

Parfitt, A.M. (Detroit, Mich.)	1
Bone Remodelling and the Regulation of Bone Volume	1
Quiescence	2
Activation	2
Resorption	4
Reversal	5
Formation	7
Some Overall Features of the Remodelling Process	8
Some Implications of Quantal Remodelling for Therapy	11
Osseous and Extra-Osseous Regulation of Plasma Calcium	13
PTH – The Link between Remodelling and Homeostasis	15
Application to Individual Therapeutic Agents	16
Calcium	17
Reproductive Hormones	17
Calcitonins	18
Bisphosphonates	18
Fluoride	19
Anabolic Steroids	19
Calciferol and Its Metabolites and Analogues	20
Coherence Therapy	20
Future Developments	21
References	22
 <i>Calcium</i>	
Heaney, R.P. (Omaha, Nebr.)	28
Introduction and Background	28
The Calcium Economy: An Overview	31
Calcium – Nutrient or Drug?	36

Calcium Deficiency	37
Calcium Intake, Calcium Deficiency, and Bone Health	40
The Relation between Calcium Intake and Bone Mass	40
Childhood and Adolescence	40
Maturity	43
Perimenopause	44
Postmenopause	44
Senescence	46
Calcium and the Loss of Disused Bone	47
Toxicity	48
Calcium and Nonosseous Disorders	49
Colon Cancer	49
Hypertension	50
References	51

The Pharmacology of Estrogens

Lindsay, R. (New York, N.Y.)	55
Loss of Ovarian Function	56
Other Factors in Osteoporotic Fracture	59
The Effect of Estrogens	61
Effects on Bone Mass	61
Estrogen in Established Osteoporosis	64
Other Routes of Administration	64
Effects on Biochemistry	65
Specificity of the Estrogen Effect	66
Estrogens and Fractures	67
The Mechanism of Estrogen Action	67
Conclusions	68
References	69

Calcitonin

Chesnut, C.H., III (Seattle, Wash.)	73
Basic Pharmacology of Calcitonin	73
Biochemical Structure	73
Available Preparations	73
Routes of Administration	73
Mechanisms of Action	74
Other Calcitonin Congeners	75
Clinical Applications for Calcitonin	75
Hypercalcemia	75
Paget's Disease	77
Osteoporosis	79

Safety of Calcitonin	85
General	85
Local Side Effects	85
Systemic Side Effects	85
Conclusions	85
References	86

The Use of Clodronate in Disorders of Calcium and Skeletal Metabolism

Kanis, J.A; McCloskey, E.V. (Sheffield)	89
Chemistry and Structure	89
Mechanism of Action	90
Mineralisation and Calcification	91
Bone Resorption	92
Pharmacokinetics of Clodronate in Man	93
Absorption and Excretion	93
Skeletal Retention	94
Interactions	96
Effects in Man	96
Remodelling of Bone	96
Skeletal Coupling and Balance	97
Paget's Disease of Bone	99
Hyperparathyroidism	106
Osteoporosis	112
Neoplasia	115
Hypercalcaemia of Malignancy	119
Treatment of Accelerated Osteolysis	124
Side Effects	125
Conclusions	126
References	127

Clinical Use of Fluoride in Osteoporosis

Mohan, S. (Loma Linda, Calif.); Stauffer, M. (White River Junction, Vt.); Baylink, D. (Loma Linda, Calif.)	137
Fluoride Metabolism	138
Absorption	138
Distribution	139
Excretion	139
Evidence for Positive Skeletal Responses to Fluoride	140
Biochemical	140
Densitometric	142
Radiological	145

Histological	146
Reduction in Number of Fractures	147
Reduction in Pain	149
Indications for Fluoride Therapy	149
Definition of Fracture Threshold	150
Dose of Fluoride	151
Duration of Fluoride Therapy	153
Monitoring Therapy	154
Side Effects	155
Gastrointestinal Side Effects	155
Periarticular Pain	156
Mineralization Defect	158
Adjuvant Therapy	158
Calcium and Vitamin D	158
Estrogen	159
Variation in Response to Fluoride Therapy	160
Conclusions	160
References	160

Anabolic Steroids

Need, A.G.; Durbridge, T.C.; Nordin, B.E.C. (Adelaide)	165
Background	166
Evidence for Androgen Deficiency in Postmenopausal Osteoporosis	169
Effects of Anabolic Steroids on Bone Metabolism	171
Effects of Anabolic Steroids on Bone Mass	173
Effects of Anabolic Steroids on Calcium Metabolism	175
Effects of Anabolic Steroid Therapy on Nonosseous Tissues	177
Conclusions	179
References	179
Subject Index	183