3

(space flights) also predisposes to osteoporosis as do excess glucocorticoids (p 18.41), hyperthyroidism and hypoinsulinism.

These conditions are associated with increased breakdown of bone matrix – this may explain the decrease in bone mass.

	SUMMARY: parathormone,	calcitonin, vitamin D and bone
Overview of	calcium metabolism	
Total body ca	alcium: approximately 1 100 g (27,5 r	nol) – en
		s hydroxyapatite crystals CaHPO4
Distribution	Extraskeletal: 1 % plasma	llular to intracellular ratio > 1 000:1 - 2,5 mmol/£ (10 mg/d£) - 50 % ionised, 45 % protein bound
	Loss ≈ 18,75 mmol (750 mg)	in stools ≈ 15 mmol in urine ≈ 3,75 mmol
Daily turnover	Intake ≈ 18,75 mmol/d	dairy products excellent source absorbed in proximal small intestine vitamin D and parathormone promote absorption lack of bile salts and lipase \$\psi\$ absorption
Homeostasis	Regulated by parathormone, c	alcitonin and vitamin D lasma Ca and Pi levels
пурегсакает	 required for calcification, enzyme a ia: parathormone or vitamin D excess a: parathormone or vitamin D deficient 	activation, hormone and transmitter release, etc. s, bone metastasis, etc. ncy — tetany may develop
Parathyroids:	parathormone (PTH)	
Secretion: cont	yroid glands (4) located on posterior troiled by plasma [Ca ²⁺]; decrease stereproparathormone → proparathormo	imulates secretion
Actions	Stimulates intestinal absorption of Ca ²⁺ indirectly Stimulates reabsorption of Ca ²⁺ in distal renal tubules Promotes urinary excretion of phosphates Activates 1α-hydroxylase and thus calcitriol production High concentrations stimulate bone resorption by osteoclasts	
Clinical conditions	Hyperparathyroidism hy characterised by	sorption of bone /percalcaemia and hypophosphataemia dney stones and calcifications contaneous fractures, pain, etc.
-	L Hypoparathyroidismhy	pocalcaemia, hyperphosphataemia and tetany uses: hypoparathyroidism or vitamin D deficiency