

# HOSPITAL PHYSICIAN®

## NEPHROLOGY BOARD REVIEW MANUAL

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## Uremic Bone Disease

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#### INTRODUCTION

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Uremic bone disease continues to present a diagnostic and therapeutic challenge to clinicians who care for patients with end-stage renal disease (ESRD). Tremendous advances have been made in many aspects of uremic bone disease, including assessing the status of hyperparathyroidism, measuring components of vitamin D, evaluating bone and joint disease by various imaging modalities, and understanding the pathogenesis of and therapy for soft-tissue calcifications. However, a distressingly large number of patients continue to develop hyperparathyroidism after prolonged hemodialysis treatment, and control of hyperphosphatemia and its attendant soft-tissue calcification remains a major clinical problem. In this review, we will examine the pathophysiologic factors that underlie the development of renal osteodystrophy and dialysis-related amyloidosis, consider the major therapeutic interventions, and develop an approach to the treatment of these often perplexing and challenging clinical disorders.

#### CASE PATIENT PRESENTATION

##### History

A 44-year-old patient with a history of focal glomerulosclerosis presents for his biannual general health evaluation. He has been treated with hemodial-

ysis for the past 9 years and generally has been compliant with his thrice-weekly hemodialysis treatments. He underwent cadaveric renal transplantation 4 years ago but rapidly rejected the kidney. He works part-time as an accountant.

On questioning, the patient reports that he has noticed some generalized pain in his arms and legs. The pain is unrelated to any particular activity. He denies any focal complaints. The rest of the history is noncontributory. Medications include a calcium channel blocker for hypertension, epoetin 10,000 U twice weekly, and 3 tablets of calcium acetate with each meal.

##### Physical Examination

The patient appears well nourished and well developed. There is a well-functioning arteriovenous fistula in his left arm. He is afebrile and has a blood pressure of 140/90 mm Hg and pulse of 80 bpm. Extremities are otherwise normal. The rest of the examination is unremarkable.

##### Laboratory Studies

Laboratory testing reveals the following: hemoglobin, 11.8 g/dL; blood urea nitrogen, 78 mg/dL; creatinine, 8.1 mg/dL; calcium, 8.7 mg/dL; phosphorus, 6.2 mg/dL; and albumin, 3.5 g/dL. Immunoassay reveals an intact immunoreactive parathyroid hormone (iPTH) level of 700 pg/mL.