

Radionuclide Bone Scintigraphy A radionuclide bone scan is traditionally the first examination obtained. If the bone scan is positive for metastatic disease, no further imaging studies are necessary. If it is inconclusive, further imaging studies are performed, including conventional radiographs, MRI, or computed tomography (CT). However, the level of post-treatment PSA that should prompt a bone scan is uncertain. In a study of patients with biochemical failure following radical prostatectomy, the probability of a positive bone scan was less than 5% with PSA levels between 40-45 ng/ml. In another study, bone scan was limited until PSA rose above 30-40 ng/ml [5]. Men with a PSADT of <6 months after radical prostatectomy were at increased risk of a positive bone scan (26% vs 3%) or positive CT (24% vs 0%) compared to those with longer PSADT [8]. Kane et al [7] reported that most patients with a positive bone scan had a high PSA level (mean of 61.3 ng/ml) and a high PSA velocity (>0.5 ng/ml/month). According to the American Urological Association's Prostate-Specific Antigen Best Practice Statement; the routine use of bone scans in the setting of a PSA rise is not justified, particularly in patients with a PSADT of >6 months and a PSA value of <10 ng/ml [17].

Computed Tomography CT is not effective for detecting recurrent tumor in the surgical bed [31]. A CT scan can recognize only local recurrences that are ≥ 2 centimeters [32]. The mean PSA value associated with a positive CT scan after radical prostatectomy was 27.4 ng/ml [7]. In the evaluation of nodal disease, CT has replaced lymphography and relies on nodal size to detect nodal metastases. Using 1 cm as a cutoff, studies have reported sensitivity between 27%-75% and specificity between 66%-100%. By decreasing the size cutoff to 0.7 cm and by sampling suspicious nodes by fine-needle aspiration (FNA), Oyen et al [33] were able to attain a sensitivity of 78% and specificity of 100%. However, this decreased size criteria with concomitant use of FNA has not been widely adopted [34]. CT is useful in detecting bone and visceral metastases, although bone scan and MRI are superior in the diagnosis and follow-up of bone metastases.