Thoracic spine imaging has always represented a challenge for MR. Of the three major anatomic regions (cervical, thoracic, and lumbar), the thoracic spine has been the area least well imaged. Respiration and cardiac motion are two major reasons. For imaging at 3 T, where all measures must be taken to limit image degradation due to motion artifacts, sagittal imaging should be performed with phase encoding in the cranial–caudal direction. Illustrated in Fig. 62–1 are (A) sagittal FSE T2-weighted, (B) FSE T1-weighted (three echoes), and (C) T1-FLAIR images of the thoracic spine in a 70-year-old patient with essentially a normal exam (a very small disk osteophyte complex is noted at T7–8). Scan times were 5:12, 3:30, and 5:12 mins:sec respectively. Two concatenations were required in each instance, resulting in these relatively long scan times. The slice thickness was 4 mm, with an FOV of 290 mm and pixel dimensions approximating 1 mm². In limited experience, thoracic spine imaging at 3 T is comparable with regard to image quality to that at 1.5 T, when attention is paid to limiting motion artifacts. It should be noted, however, that 3 T is in its infancy. Future improvements in coil technology likely will lead to a further increase in SNR. For T1-weighted imaging at 3 T, the choice lies between SE (or FSE) technique and T1-FLAIR. The latter offers improved cord-CSF contrast on T1-weighted scans (as illustrated), which is often poor with SE (or FSE) technique at 3 T. However, T1-FLAIR requires a longer scan time and is more sensitive to motion artifacts.

Figure 62–2 presents images at (A, D) 1.5 T and (B, C, E, F) 3 T in a patient with non–small cell lung carcinoma metastatic to T6 and T7. The slice thickness was 4 mm, with no attempt made to reduce scan times at 3 T when compared with 1.5 T. The 1.5 T...
images are degraded to some extent due to the use of a larger pixel size. The near complete replacement of the T7 vertebral body with metastatic disease is well visualized on all T1-weighted scans, with (C) T1-FLAIR demonstrating slightly improved contrast between tumor and normal marrow, as well as between cord and CSF. Tumor involvement on T2-weighted scans is best depicted on the 3 T scan (F) with fat saturation.