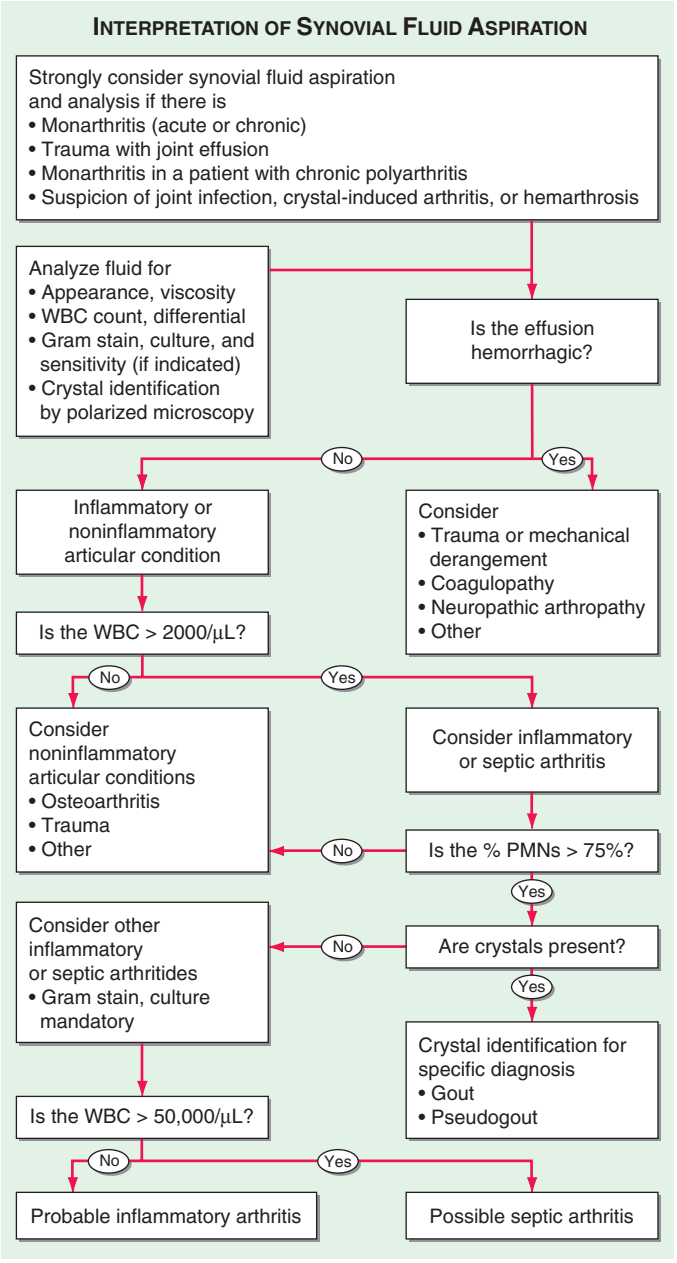

FIGURE 393-6 Algorithmic approach to the use and interpretation of synovial fluid aspiration and analysis. PMNs, polymorphonuclear (leukocytes); WBC, white blood cell (count).

crystal deposition on cartilage. Use of power Doppler allows for early detection of synovitis and bony erosions. *Radionuclide scintigraphy* is a very sensitive, but poorly specific, means of detecting inflammatory or metabolic alterations in bone or periarticular soft tissue structures. Scintigraphy is best suited for total-body assessment (extent and distribution) of skeletal involvement (neoplasia, Paget's disease) and the assessment of patients with undiagnosed polyarthralgias, looking for occult arthritis. The use of scintigraphy has declined with greater use and declining cost of ultrasound and MRI. The limited tissue contrast resolution of scintigraphy may obscure the distinction between a bony or periarticular process and may necessitate the additional use of MRI. Scintigraphy using ^{99m}Tc, ^{67}Ga, or ^{111}In-labeled WBCs has been applied to a variety of articular disorders with variable success (Table 393-5). Although [^{99m}Tc] diphosphate scintigraphy may be useful in identifying osseous infection, neoplasia, inflammation, increased blood flow, bone remodeling, heterotopic bone formation, or avascular necrosis, MRI is preferred in most instances. Gallium scanning uses ^{67}Ga, which binds serum and cellular transferrin and lactoferrin and is preferentially taken up by neutrophils, macrophages,

TABLE 393-5 DIAGNOSTIC IMAGING TECHNIQUES FOR MUSCULOSKELETAL DISORDERS

Method	Imaging Time, h	Cost[a]	Current Indications
Ultrasound	<1	++	Synovial (Baker's) cysts
			Rotator cuff tears
			Bursitis, tendinitis, tendon injury
			Enthesitis
			Carpal tunnel syndrome
			Urate or calcium pyrophosphate deposition on cartilage
			Early detection of synovial inflammation or erosions
			Ultrasound-guided injection/ arthrocentesis
Radionuclide scintigraphy			
^{99m}Tc	1–4	++	Metastatic bone survey
			Evaluation of Paget's disease
			Identifying occult arthritis in patients with undiagnosed polyarthralgia
^{111}In-WBC	24	+++	Acute infection
			Prosthetic infection
			Acute osteomyelitis
^{67}Ga	24–48	++++	Acute and chronic infection
			Acute osteomyelitis
Computed tomography (CT)	<1	+++	Herniated intervertebral disk
			Sacroiliitis
			Spinal stenosis
			Spinal trauma
			Osteoid osteoma
			Stress fracture
Dual-energy CT	<1	NA	Uric acid deposition
			Tophus localization
Magnetic resonance imaging	1/2–2	++++	Avascular necrosis
			Osteomyelitis
			Septic arthritis, infected prosthetic joints
			Early sacroiliitis
			Intraarticular derangement and soft tissue injury
			Derangements of axial skeleton and spinal cord
			Herniated intervertebral disk
			Pigmented villonodular synovitis
			Inflammatory and metabolic muscle pathology

[a]Relative cost for imaging study.

Abbreviations: NA, not commercially available; WBC, white blood cell.

bacteria, and tumor tissue (e.g., lymphoma). As such, it is primarily used in the identification of occult infection or malignancy. Scanning with ^{111}In-labeled WBCs has been used to detect osteomyelitis and infectious or inflammatory arthritis. Despite their utility, ^{111}In-labeled WBC or ^{67}Ga scanning has largely been replaced by MRI, except when there is a suspicion of septic joint or prosthetic joint infections.

Computed tomography (CT) provides detailed visualization of the axial skeleton. Articulations previously considered difficult to visualize by radiography (e.g., zygapophyseal, sacroiliac, sternoclavicular, hip joints) can be effectively evaluated using CT. CT has been demonstrated to be useful in the diagnosis of low back pain syndromes (e.g., spinal stenosis vs herniated disk), sacroiliitis, osteoid osteoma, and stress fractures. Helical or spiral CT (with or without contrast angiography) is a novel technique that is rapid, cost effective, and sensitive