The Cost of Surveillance in California: MRI Utilization in Recurrent Extremity Soft Tissue Sarcoma

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INTRODUCTION: Current guidelines for soft tissue sarcomas (STS) recommend routine imaging surveillance, with MRI being the preferred modality for extremity lesions. However, the economic burden of long-term MRI surveillance remains poorly characterized. Understanding these costs is crucial for developing value-based surveillance strategies. This study aimed to evaluate the 5-year cost of MRI surveillance for extremity STS patients following surgical resection in California, stratified by recurrence.

METHODS: The 2017–2024 Humana Pearl Diver M170 Ortho dataset was queried for California patients undergoing surgical excision of an extremity soft tissue tumor between 2010 and 2018 using Current Procedural Terminology (CPT) codes (UE: 23077, 23078, 24077, 24079, 25077, 25078, 26117, 26118; LE: 27049, 27059, 27364, 27615, 27616, 28046, 28047). MRI utilization was tracked over a five-year surveillance period with CPT codes 73218-23 and 73718-23. Recurrence was defined as CPT codes for subsequent tumor excision, radiation (CPT 77401-77417, 47740), or chemotherapy (CPT 96401, 96402, 96409, 96411) during the surveillance period. Financial burden was evaluated using insurer-reported reimbursement amounts. Primary outcomes included number of MRIs, average cost per MRI, and total surveillance cost per patient.

RESULTS: A total of 1,793 patients (765 UE and 1,028 LE) with complete five-year follow-up data were identified (mean age, 58.18 years; 53.5% female). Of these, 132 (7.36%) experienced recurrence, while 1,661 (92.6%) showed no recorded recurrence. On average, patients without recurrence underwent 4.2 MRIs, whereas those with recurrence underwent 6.7 MRIs. Financial analysis revealed that in the no recurrence group, the average cost per MRI was $865.30, and the total cost of surveillance per patient was $3,043.61. In contrast, the average cost per MRI was $983.29, and the total cost of surveillance per patient was $5,240.95 in the recurrence group. Stratification by extremity is detailed in Table 1.

DISCUSSION AND CONCLUSION: The increased cost of MRI surveillance in patients with recurrent extremity soft tissue sarcoma highlights the substantial financial burden associated with managing recurrence. Over 5 years, patients with recurrence required 59.5% more MRIs (6.7 vs. 4.2) and incurred 72% higher total surveillance costs ($5,241 vs $3,044) compared to those without recurrence. The elevated cost per MRI in the recurrence group ($983 vs $865) further amplified financial strain, reflecting complex imaging needs for disease monitoring. These findings quantify the substantial economic burden of surveillance and highlight the need risk stratification and tailored surveillance protocols to optimize resource allocation and improve cost-effectiveness.

Table 1. Surveillance Metrics Stratified by Extremity and Recurrence Status

	Subgroup (n)	Age (SD)	Sex	# of MRIs	Cost per MRI	Total Surveillance Cost
Recurrence	UE (49)	57.78 (19)	22F/27M	7.85	$927.98	$5389.42
	LE (83)	56.93 (19)	35F/48M	5.45	$1038.6	$5092.48
	Combined (132)	57.36	57F/75M	6.65	$983.29	$5240.95
No Recurrence	UE (716)	59.21 (16.6)	385F/331M	3.97	$793.33	$2735.22
	LE (945)	58.78 (15.7)	518F/427M	4.32	$937.27	$3352
	Combined (1661)	58.99	903F/758M	4.15	$865.30	$3043.61