AAVBC
AMERICAN ACADEMY OF VALUE BASED CARE

Soft Tissue Sarcoma

Quick Reference Guide

2026

Table of Contents

1 CLINICAL SNAPSHOT

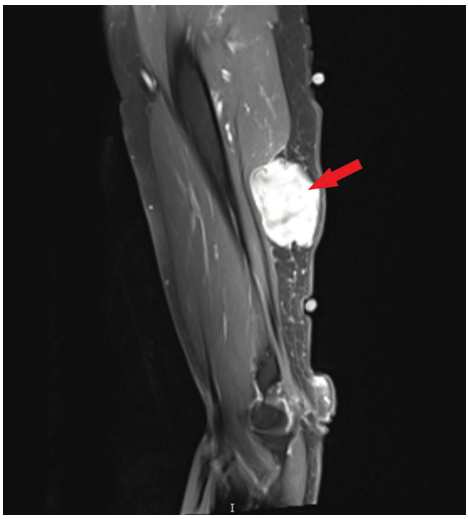
Definition: **Soft tissue sarcomas** (STS) are a rare and biologically heterogeneous group of malignancies arising from **mesenchymal connective tissues** (fat, muscle, nerves, tendons, blood vessels, and deep skin structures) most commonly in the **extremities**, **trunk**, **retroperitoneum**, and **abdomen**.[1] The **2020 WHO Classification of Tumours of Soft Tissue and Bone** (5th edition) recognizes more than **50** distinct subtypes organized by line of differentiation, including **undifferentiated pleomorphic sarcoma**, **liposarcoma**, **leiomyosarcoma**, **gastrointestinal stromal tumor (GIST)**, and **Kaposi sarcoma**.[2,3] There is **no single** '**sarcoma**' **presentation**: each subtype carries distinct biology and treatment pathways, so histotype and anatomic site drive management.[3–5]

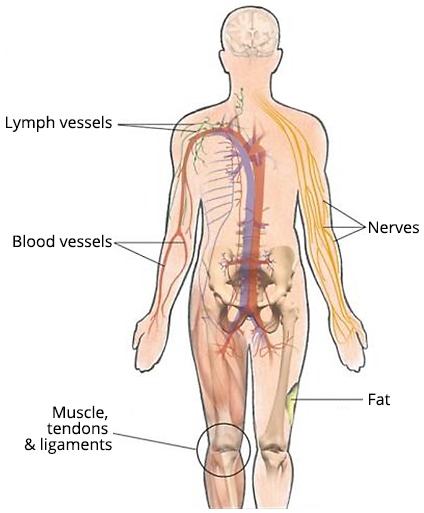
ICD-10 Codes:

Confirmed soft tissue sarcoma is reported with **site-** and **laterality-specific codes** in the **C49** series (malignant neoplasm of connective and soft tissue): **C49.0** (head/face/neck), **C49.11/ C49.12** (right/left upper limb), **C49.21/C49.22** (right/left lower limb), **C49.3** (thorax), **C49.4** (abdomen), **C49.5** (pelvis), **C49.6** (trunk, unspecified), and **C49.9** (connective/soft tissue, unspecified; **AVOID** when the site is known).[6] **GIST** has its own series, **C49.A0-C49.A9** (by site), and should **never be coded under generic C49.x**.[6] Related sites include retroperitoneum and peritoneum (**C48.0-C48.2**), peripheral nerves (**C47.-**), and Kaposi sarcoma (**C46.-**).[6] Two codes are **interim only**: **R22.-** (localized swelling/mass, by site) while a suspicious mass awaits biopsy, and **D48.1** (uncertain behavior) for indeterminate pathology; **D17.-** (benign lipoma) should **not** be assigned to a **mass under evaluation for malignancy**.[6] After treatment, **Z85.831** documents personal history of soft tissue malignancy and supports medical necessity for surveillance.[6]

Prevalence and Burden: STS accounts for approximately **1%** of all adult cancers, with an overall age-adjusted incidence of about **5.9 per 100,000** persons that rises to roughly **18.2 per 100,000** in adults over age 70 – approximately threefold the general-population rate.[7] This is fundamentally a disease of older adults: about **60%** of STS cases occur in patients aged **65 years or older**, and the modal decade of diagnosis is the eighth decade of life.[8,9] In the United States, an estimated **13, 520** new cases of soft tissue sarcoma (including heart) and **5,410** deaths were projected for 2025.[10] The rising incidence in the elderly is driven primarily by leiomyosarcoma, liposarcoma, and fibrohistiocytic tumors.[7]

Soft Tissues Affected By Sarcoma





HCC/RAF V28 Mapping

ICD-10 CODE(S)[6]	HCC CATEGORY (V28)[11]	RAF (CNA)*[12]	DOCUMENTATION REQUIREMENT[6]
C49.11/C49.12/C49.21/ C49.22 (extremity STS, lateralized)	**HCC 21** – Lymphoma and **Other Cancers**	0.671	**Extremity STS**; **document**: "STS of [right/left] [upper/lower] extremity;" replace unspecified **C49.10/C49.20** once laterality is known
C49.0/C49.3/C49.5/ C49.6/C49.8/C49.9 (head/neck, thorax, pelvis, trunk, overlapping, unspecified)	**HCC 21** – Lymphoma and **Other Cancers**	0.671	**Document specific anatomic site**; reserve **C49.9** only when **site genuinely cannot be determined**
C49.4 (abdomen)	**HCC 23** – Prostate/Breast/ **Other Cancers and Tumors**	0.186	**Document**: "abdominal soft tissue sarcoma" with **histologic subtype**; if tumor is retroperitoneal, code to **C48.x** instead → **verify origin site** on imaging/ operative report
C48.0/C48.1/C48.2 (retroperitoneum/ peritoneum)	**HCC 20** – Lung and **Other Severe Cancers**	1.136	Distinguish retroperitoneal (**C48.x**) from abdominal soft tissue (**C49.4**)
C49.A0–C49.A9 (GIST by site)	**HCC 23** – Prostate/Breast/ **Other Cancers and Tumors**	0.186	GIST uses its own subcode series; **never code under generic C49.x**; **document**: histology plus site
R22.-/D48.1 (localized mass/uncertain behavior)	No HCC	–	**TRAP**: interim codes only; transition to **C49.x** at **pathology confirmation**
D17.-/Z85.831 (benign lipoma/personal history)	No HCC	–	Do not assign **D17.-** to a mass under **malignancy evaluation**; **Z85.831** supports surveillance medical necessity

ABBREVIATIONS: ICD-10 = International Classification of Diseases, 10th Revision; ICD-10-CM = International Classification of Diseases, 10th Revision, Clinical Modification; HCC = Hierarchical Condition Category; V28 = CMS-HCC Model Version 28; RAF = Risk Adjustment Factor; CNA = Community Non-Dual Eligible, Aged segment; STS = soft tissue sarcoma; GIST = gastrointestinal stromal tumor; CMS = Centers for Medicare & Medicaid Services; MA = Medicare Advantage

***RAF values represent the Community Non-Dual Eligible Aged (CNA) coefficient from the 2026 CMS-HCC model;[12] values vary across patient populations based on eligibility and care setting**

RAF values represent the Community Non-Dual Eligible Aged (CNA) coefficient from the 2026 CMS-HCC model; values vary across patient populations based on eligibility and care setting

Risk-Adjusted Care Resources per Patient/Year[11,12]

Risk-adjusted care resource allocation — MA base rate (~$10,402.34) × RAF coefficient

EXTREMITY STS	ABDOMINAL STS/GIST	RETROPERITONEAL STS
$7.0K	**$1.9K**	**$11.8K**
HCC 21 · RAF 0.671	HCC 23 · RAF 0.186	HCC 20 · RAF 1.136

Annual risk value illustrative at base rate ~$10,402/year; actual plan payment varies by county and contract year

AAVBC PERSPECTIVE

From the AAVBC's perspective, value-based care in soft tissue sarcoma (STS) *begins with diagnostic stewardship* ***at first presentation****. Primary care's* ***window of action is brief****: early recognition enables limb-sparing treatment and improves long-term outcomes, while missed opportunities can* ***lead to metastatic progression****.*[3,13] *Any soft tissue mass that is* ***>5 cm****,* ***deep to the fascia****,* ***progressively enlarging****,* ***firm****,* ***or symptomatic*** *should be* ***presumed malignant*** *until proven otherwise.*[3,14] ***PCPs should stop performing in-office excisions or blind biopsies*** *of uncharacterized masses and instead obtain MRI with contrast or expedite referral to a* ***multidisciplinary sarcoma center****.*[3,14]
The greatest challenge in primary care is ***under-recognition****.*[13,14] *STS commonly presents as a* ***painless enlarging mass*** *and is frequently mistaken for a lipoma or cyst, leading to* ***inappropriate "watch and wait" management****.*[1,14] *An unplanned "shell-out" excision* ***is not a benign procedural error****; it contaminates tissue planes, complicates definitive surgery, and may* ***reduce the likelihood of limb salvage****.*[3] *Following specialist treatment,* ***PCPs remain accountable for*** *longitudinal surveillance, recurrence monitoring, and documenting survivorship plans, recognizing that* ***STS is not a "refer and forget" diagnosis****.*[3,15]

2 RECOGNITION AND DIAGNOSIS

Medicare Screenings and Surveillance (Adult and Geriatric)

There is no population-based STS screening test; STS accounts for **~1%** of adult cancers and no validated screening tool exists.[10,16] Evaluation is **symptom-triggered**; secondary prevention is limited to surveillance of **genetic-predisposition** syndromes and **prior-radiation** fields.[3] **Medicare Part B** covers the following diagnostic tests and workup **when medically necessary**:

TEST	FREQUENCY	CPT/HCPCS	CLINICAL INDICATION[3,14,17,18]
MRI extremity ± contrast	**At presentation** of a suspicious mass; surveillance per NCCN intervals	73220/73720	**Gold standard for**: a deep, firm, large, or rapidly growing soft tissue mass; **preferred over ultrasound**
Ultrasound of soft tissue mass	**Initial triage** when readily available	76881/76882	**Assesses**: size, depth, and cystic vs solid nature; indeterminate result **warrants MRI**
Image-guided core needle biopsy	**After imaging**, before any resection	Site-specific (e.g., 20206)	**Preferred over incisional biopsy**; tract placed along future resection axis; performed at/with a sarcoma center
CT chest ± contrast	**Staging** and surveillance per NCCN	71250/71260	**Lungs** are the dominant **metastatic site** for extremity/trunk STS; baseline staging and recurrence surveillance
FDG-PET/CT, skull base to mid-thigh†	**Initial staging** and **restaging** when indicated	78816	Useful for **grading correlation** and for differentiating MPNST from neurofibroma in NF1; **not routine for all subtypes**
Genetic counseling/ testing‡	Per personal/family history	96040/ 81162-series	**For suspected**: Li-Fraumeni (**TP53**), hereditary retinoblastoma (RB1), NF1, or Lynch/FAP (desmoid); follow NCCN genetic high-risk assessment
Geriatric screening (G8/ VES-13)§	**Before treatment** in adults ≥65	—	**G8 score ≤14** → full geriatric assessment; VES-13 score **≥3** indicates vulnerability → triggers comprehensive GA and targeted interventions

ABBREVIATIONS: MRI = magnetic resonance imaging; NCCN = National Comprehensive Cancer Network; CPT/HCPCS = Current Procedural Terminology/Healthcare Common Procedure Coding System; CT = computed tomography; FDG-PET = fluorodeoxyglucose positron emission tomography; MPNST = malignant peripheral nerve sheath tumor; NF1 = neurofibromatosis type 1; STS = soft tissue sarcoma; NCD = National Coverage Determination; CMS = Centers for Medicare & Medicaid Services; GA = geriatric assessment; G8 = Geriatric 8 screening tool; VES-13 = Vulnerable Elders Survey-13; ASCO = American Society of Clinical Oncology; ACP = advance care planning; AWV = Annual Wellness Visit; FAP = familial adenomatous polyposis

† FDG-PET/CT is not routine for all STS subtypes. CMS covers FDG-PET for staging, restaging, and treatment monitoring of solid tumors under NCD 220.6

‡ Medicare Part B covers genetic counseling and testing when clinical criteria are met (e.g., personal/family history meeting NCCN high-risk thresholds). Relevant syndromes include Li-Fraumeni (TP53), hereditary retinoblastoma (RB1), NF1, and Lynch/FAP for desmoid tumors

§ NCCN Older Adult Oncology guidelines list G8, VES-13, and other validated screening tools; no evidence exists for superiority of one tool over another. ASCO guidelines recommend GA-guided management for all patients ≥65 receiving systemic cancer therapy

‖ ACP is covered with no patient copay when performed during the AWV; 99497 covers the first 30 minutes, 99498 each additional 30 minutes

Subtle Early Signs in Older Adults (>65)

SIGN/SYMPTOM[1,3,14,19]	CLINICAL SIGNIFICANCE[1,3,14,20]
New or enlarging soft tissue mass ≥5 cm	A mass **larger than a golf ball** is a recognized red flag; the **5 cm threshold is a guide**, not a gate → smaller deep or rapidly growing masses can still be **aggressive sarcomas**
Mass deep to the muscular fascia	**Deep location** is among the strongest **red flags** and warrants full evaluation **regardless of size**; refer to a sarcoma center **before any biopsy or resection**
Firm, hard, or fixed/ immobile mass	**Firmness** and **fixation to surrounding structures** increase malignancy risk; **do not** be reassured by a soft, mobile feel alone
Rapid growth of a soft tissue mass	**Documented enlargement** over weeks to months is a danger sign even when the mass is painless; track and **document the growth rate**
Painless lump in an older adult	Most soft tissue sarcomas are **painless in early stages**; absence of pain **does not reduce suspicion** and must not delay imaging or referral
New mass arising in a prior radiation field	Radiation-associated sarcoma has a latency of **3-15 years** and an **8- to 50-fold** increased risk; **maintain awareness** in breast, cervical, or lymphoma survivors
New mass in a known predisposition syndrome	NF1 carries roughly a **10%** lifetime risk of malignant peripheral nerve sheath tumor; a **new or changing mass** warrants prompt MRI and FDG-PET evaluation
Chronic limb lymphedema with a new lesion	**Long-standing lymphedema** (e.g., post-mastectomy) is associated with angiosarcoma (Stewart-Treves) → a relevant **late risk** in elderly breast cancer survivors

ABBREVIATIONS: FDG-PET = fluorodeoxyglucose positron emission tomography; MRI = magnetic resonance imaging; NF1 = neurofibromatosis type 1

Geriatric Risk Factors

FACTOR[1,3,21,22]	RISK SIGNAL[1,23–25]	NOTES[3,25–28]
Prior radiation therapy	**8- to 50-fold** increased risk; latency 3-15 years	**Well-established**; relevant to elderly breast, cervical, and lymphoma survivors with new masses in prior fields
Neurofibromatosis type 1 (NF1)	~**10%** lifetime risk of MPNST	A **new or changing peripheral nerve mass** requires FDG-PET to differentiate MPNST from benign neurofibroma

FACTOR[1,3,21,22]	RISK SIGNAL[1,23–25]	NOTES[3,25–28]
Li-Fraumeni syndrome (germline TP53)	Markedly elevated **lifetime sarcoma risk**	Rare but **high-penetrance**; triggers genetic counseling and high-risk surveillance per NCCN
Hereditary retinoblastoma (RB1)	Exceptionally high **osteosarcoma and STS risk**	Risk is further increased by **prior radiation**; typically younger onset but relevant to family-history screening
Chronic lymphedema (Stewart-Treves)	Rare but well-documented angiosarcoma association	Relevant to **elderly post-mastectomy** breast cancer survivors with chronic arm lymphedema
Immunosuppression/ HIV	Associated with **Kaposi sarcoma** and **EBV-related leiomyosarcoma**	**Viral etiology (human herpesvirus 8 (HHV-8)** ; consider in immunocompromised older adults
Family history of STS	**OR >7** (small numbers: 0.6% cases vs 0.1% controls)	Suggestive but limited by **small numbers** in a 2026 Italian case-control study; not yet a validated screening criterion
Environmental/ occupational exposures	Phenoxyherbicides, dioxin, vinyl chloride, arsenicals	Account for a **minority of cases**; weak-to-moderate signals
Vaccine injection site exacerbation	**Single case report:** Grade 3 undifferentiated pleomorphic sarcoma at Moderna mRNA-1273 **injection site** in a 73-year-old female	**No causal link established**; temporal association only; may reflect inflammatory unmasking of subclinical lesion → **included for awareness**
Common metabolic comorbidities	**No increased STS risk** in largest case-control data	Hypertension, hypercholesterolemia, and diabetes were **not associated with STS risk** (2026) → **do not** reassure based on their absence

ABBREVIATIONS: MPNST = malignant peripheral nerve sheath tumor; FDG-PET = fluorodeoxyglucose positron emission tomography; NCCN = National Comprehensive Cancer Network; STS = soft tissue sarcoma; EBV = Epstein-Barr virus; HIV = human immunodeficiency virus; NF1 = neurofibromatosis type 1; OR = odds ratio

Diagnostic Thresholds (AAFP Red Flags, AJCC 8th Ed, FNCLCC Grade)

Soft tissue sarcoma diagnosis typically follows **one of two presentation pathways**: a patient presents with a **new or enlarging soft tissue mass**, or a mass is found **incidentally on imaging**.[1,14,27] Detection relies on **clinical suspicion**; there is no population-based screening test.[14] When a suspicious mass is identified, the AAFP recommends that any mass meeting **at least one red-flag criterion** (≥5 cm, deep to the fascia, matted to surrounding structures, or rapidly growing) should be treated as **potentially malignant until proven otherwise**.[14] Size is one flag among several, **not a standalone threshold**: approximately **10%** of malignant soft tissue masses

are **<5 cm** at diagnosis.[14] A painless lump is **not reassuring**; most STS present as painless masses.[1,14,27]

The **NCCN Soft Tissue Sarcoma Guidelines** (v4.2026) recommend that all patients with a lesion with a reasonable chance of being malignant **undergo MRI with contrast** (preferred; category 2A) of the primary tumor, followed by a **carefully planned core needle biopsy** (preferred over incisional biopsy) placed along the future resection axis, performed at or coordinated with a **sarcoma center**.[3] Ultrasound can screen size and depth but **cannot exclude sarcoma**; CT is preferred for **retroperitoneal/intra-abdominal disease**.[3,14] Imaging triages but does not confirm → **tissue diagnosis by a sarcoma pathologist is required** before any resection.[3] An **unplanned excision** ("shelling out") can contaminate tissue planes and **compromise limb-sparing surgery**.[3,29]

AJCC 8th-Edition TNM Staging (2017)

The AJCC 8th edition introduced **site-specific staging systems for STS**: trunk/extremity, retroperitoneum, head/neck, and abdominal/thoracic visceral organs — each with distinct T definitions.[3,8,30] **The trunk/extremity system is most relevant to the primary care referral context**. Key changes from the 7th edition include: (**1**) T stage expanded from two to four size categories, (**2**) tumor depth removed as a staging variable, and (**3**) nodal disease (**N1M0**) reclassified as stage IV for trunk/extremity STS.[30,31]

Trunk/Extremity- T Stage

T STAGE	DEFINITION
TX	Primary tumor cannot be assessed
T0	No evidence for primary tumor
T1	Tumor ≤5 cm in greatest dimension
T2	Tumor >5 cm and ≤10 cm
T3	Tumor >10 cm and ≤15 cm
T4	Tumor >15 cm

Trunk/Extremity- N and M Stage

STAGE	DEFINITION
N0	No regional lymph node metastasis or unknown lymph node status
N1	Regional lymph node metastasis
M0	No distant metastasis
M1	Distant metastasis

Trunk/Extremity- AJCC Anatomic Stage/Prognostic Groups

AJCC STAGE	T	N	M	GRADE
IA	T1	N0	M0	G1, GX
IB	T2, T3, T4	N0	M0	G1, GX
II	T1	N0	M0	G2, G3
IIIA	T2	N0	M0	G2, G3
IIIB	T3, T4	N0	M0	G2, G3
IV	Any T	N1	M0	Any G
IV	Any T	Any N	M1	Any G

CLINICAL PEARL: N1M0 STAGING DIFFERS BY ANATOMIC SITE

The key distinction from retroperitoneal staging: in the **trunk/extremity** system, **N1M0** disease is **stage IV**, whereas in the retroperitoneal system **N1M0** remains **stage IIIB**.[3,31,32] This difference reflects the distinct biology and prognosis of nodal disease by site. In an NCDB validation (n = 26,144), patients with isolated nodal disease had **significantly better 5-year OS** than those with **distant metastases** (33.1% vs. 12.4%, p <0.001), raising questions about **grouping both as stage IV**.[33,34]

FNCLCC Histologic Grade

Grade is the **single most important prognostic factor after metastatic status** and is required before initiating neoadjuvant therapy.[3,35] The **FNCLCC system scores three parameters**: Differentiation (**1–3**), mitotic count (**1–3**), and necrosis (**0–2**); these scores are **summed** to assign grade:[3,36]

PARAMETER	SCORE 1	SCORE 2	SCORE 3
Differentiation	Resembles normal mesenchymal tissue	Histologic typing certain	Embryonal, undifferentiated, synovial, PNET
Mitotic count	**0–9** per 10 HPF	**10–19** per 10 HPF	**≥20** per 10 HPF
Necrosis	**0** (none)	**1** (<50%)	**2** (≥50%)
G1 (total 2–3): low grade → Stage I regardless of size			
G2 (total 4–5): intermediate grade → Stage II–IIIB depending on size			
G3 (total 6–8): high grade → Stage II–IIIB depending on size			

ABBREVIATIONS: PNET = primitive neuroectodermal tumor; HPF = high-power field; FNCLCC = Fédération Nationale des Centres de Lutte Contre le Cancer

WHO Classification, 5th Edition (2020)

The **WHO 5th edition** (2020) recognizes **>50** distinct soft tissue sarcoma subtypes organized by **line of differentiation** (adipocytic, fibroblastic, smooth muscle, skeletal muscle, vascular, peripheral nerve sheath, uncertain differentiation, and others).[2,3,36] Subtype **determines systemic therapy choice:** GIST is distinct and **imatinib-eligible**, while myxoid liposarcoma and synovial sarcoma are relatively **chemotherapy-sensitive**.[3,37] The updated classification incorporates **novel molecular entities** (e.g., CIC-rearranged sarcoma, BCOR-altered sarcoma) and **refined prognostic information** for existing entities.[2,38]

Prognostic Nomograms

The **Sarculator** (freely available as a mobile app) and **MSKCC nomogram** are the two most widely validated prognostic tools for resected extremity STS.[35,39,40] Sarculator incorporates age, tumor size, FNCLCC grade, and histologic subtype to predict overall survival and distant metastasis cumulative incidence, with **C-indices of 0.72–0.77** across multi-institutional US and international validation cohorts.[39,41] The **ESMO clinical practice guidelines** reference Sarculator to facilitate discussions around **perioperative chemotherapy**.[42] A Bayesian-updated version (**BayeSarc**, 2026) iteratively recalibrates as new cohorts accrue, with **improved C-indices up to 0.80**.[41] These tools support **shared decision-making** about neoadjuvant therapy and treatment intensity, particularly in older adults where **balancing toxicity against benefit is critical**.[3,43]

Resectability and Prognosis

Estimated 5-year OS for **resected primary extremity STS** is approximately **70%** overall (median OS 172 months in a multi-institutional US cohort, n = 1,326).[39] Prognosis **varies substantially** by stage, grade, and histology. In a large French real-world cohort, 5-year OS for localized STS was 64%.[44]

Diagnostic/Staging Tool Summary

TEST/SYSTEM	DIAGNOSTIC CRITERION	NOTES
AAFP red-flag features (evidence rating C)[14]	**Any one of**: mass ≥5 cm, deep to fascia, matted to structures, or rapid growth	Size is **one flag among several**; ~10% of malignant masses are <5 cm; painlessness is not reassuring
MRI with contrast (NCCN category 2A)[3,14]	**Preferred primary tumor imaging** for extremity/trunk/head-neck STS	Ultrasound screens **size/depth only**; CT for retroperitoneal/intra-abdominal disease
Core needle biopsy[3]	Image-guided, tract along future resection axis; **at/with sarcoma center**	Open incisional biopsy only if core is non-diagnostic; **never** "shell out" a deep mass
AJCC 8th-edition TNM (2017)[3,31]	**Site-specific staging**: trunk/extremity, retroperitoneum, head/neck, visceral	**T1** ≤5 cm; **T2** >5–10 cm; **T3** >10–15 cm; **T4** >15 cm (trunk/extremity)
FNCLCC histologic grade[3,35]	Differentiation + mitotic count + necrosis → **G1** (2–3), **G2** (4–5), **G3** (6–8)	Most important prognostic factor **after metastatic status**; drives surveillance intensity

TEST/SYSTEM	DIAGNOSTIC CRITERION	NOTES
WHO Classification, 5th ed (2020)[2,3]	**>50 subtypes** by line of differentiation	Subtype **determines systemic therapy**; GIST is distinct (imatinib-eligible)
Sarculator/MSKCC nomogram[39,41]	**Individual prognosis**: OS and distant metastasis after resection	**Sarculator C-index 0.72–0.77** (US validation); referenced in ESMO guidelines for perioperative chemotherapy decisions

ABBREVIATIONS: AAFP = American Academy of Family Physicians; MRI = magnetic resonance imaging; NCCN = National Comprehensive Cancer Network; STS = soft tissue sarcoma; CT = computed tomography; AJCC = American Joint Committee on Cancer; TNM = tumor-node-metastasis; FNCLCC = Fédération Nationale des Centres de Lutte Contre le Cancer; WHO = World Health Organization; GIST = gastrointestinal stromal tumor; MSKCC = Memorial Sloan Kettering Cancer Center; OS = overall survival; ESMO = European Society for Medical Oncology

Clues to Dig Deeper

CLINICAL CLUE[3,14]	WHY IT MATTERS[1,45–47]	NEXT DIAGNOSTIC STEP[3,48]
Any deep, firm, or enlarging soft tissue mass	The single most valuable PCP behavior change is to **shorten diagnostic delay** rather than 'watch and wait'	**Order MRI with contrast**; refer directly to a sarcoma center → **do not biopsy or excise in office**
Painless mass that keeps growing	Absence of pain is **falsely reassuring**; most early sarcomas are **painless**	**Document**: size, depth, firmness, and growth rate; image and refer **regardless of pain**
Indeterminate ultrasound of a soft tissue mass	Ultrasound is often **non-diagnostic** for deep or large masses	**Expedite MRI** with contrast and orthopedic/surgical oncology referral
Mass deep to the fascia, any size	Deep location warrants sarcoma-center evaluation **before any procedure**	**Direct sarcoma-center referral**; population data show this halves referral time
New mass in NF1, Li-Fraumeni, or prior radiation field	Predisposition syndromes and prior RT **sharply raise sarcoma risk**	**Prompt MRI**; **FDG-PET** for suspected MPNST in NF1; genetic-clinic coordination
Recurrent mass at a prior excision site	Roughly **two-thirds** of local recurrences are detected by **clinical signs** or **patient self-exam**	**Imaging and sarcoma-center evaluation**; reinforce structured surveillance and self-monitoring
New pulmonary nodules in known STS	Lungs are the **dominant metastatic site**; new nodules suggest metastasis	**Urgent oncology evaluation** and chest CT correlation

ABBREVIATIONS: PCP = primary care provider; MRI = magnetic resonance imaging; NF1 = neurofibromatosis type 1; RT = radiation therapy; FDG-PET = fluorodeoxyglucose positron emission tomography; MPNST = malignant peripheral nerve sheath tumor; STS = soft tissue sarcoma; CT = computed tomography

Common Oversights

OVERSIGHT/ SHORTCUT[3,14,45,46]	WHY IT MATTERS - WHAT TO DO INSTEAD[3,14,47,48]
'Watch and wait' on a deep or enlarging mass	Reassurance based on physical exam alone **delays diagnosis**; **image any suspicious mass with MRI** and refer rather than observing
Assuming a painless lump is benign	Most early sarcomas are **painless**; evaluate every suspicious mass systematically **regardless of pain**
Relying on ultrasound to exclude malignancy	Ultrasound is frequently **indeterminate for deep masses**; obtain **MRI with contrast** when malignancy cannot be excluded
Treating imaging as a definitive diagnosis	A reassuring MRI **does not rule out sarcoma**; confirmation requires core needle biopsy read by a **sarcoma pathologist**
Unplanned excision ('shelling out') before referral	Disrupts the tumor capsule, contaminates the biopsy tract, compromises margins, and reduces limb-salvage and survival **= A HARM EVENT, not a minor misstep**
Reassuring on the basis of normal labs	There is **no serum biomarker for STS**; a normal CBC/CMP/tumor panel **does not lower suspicion**
Missing radiation-associated sarcoma in survivors	A new mass in a prior radiation field (latency **3-15 years**) should **prompt imaging**, not reassurance
Flattening all subtypes into 'sarcoma'	Histotype and site **change treatment and prognosis**; recognize GIST and other subtypes as distinct entities at referral
Treating STS as 'hand off and forget'	Local and distant recurrence risk persists for years; the **PCP co-owns long-term surveillance and survivorship care**

ABBREVIATIONS: MRI = magnetic resonance imaging; STS = soft tissue sarcoma; CBC = complete blood count; CMP = comprehensive metabolic panel; GIST = gastrointestinal stromal tumor; PCP = primary care provider

Key Differentials in Elderly

PRESENTATION	DIFFERENTIAL[3,14,49,50]	KEY TESTS[3,14,51]
Superficial, soft, mobile subcutaneous mass	**Benign lipoma**; epidermoid cyst; angiolipoma; **well-differentiated liposarcoma** if deep/large	**MRI with contrast if**: deep, ≥5 cm, firm, or growing; **biopsy** if imaging is concerning
Deep, firm intramuscular extremity mass	**Soft tissue sarcoma** (UPS, liposarcoma, leiomyosarcoma); deep benign tumor; hematoma; abscess	**MRI with contrast**; image-guided core needle biopsy at a sarcoma center

PRESENTATION	DIFFERENTIAL[3,14,49,50]	KEY TESTS[3,14,51]
Retroperitoneal or abdominal mass	Retroperitoneal liposarcoma/ leiomyosarcoma (**C48.x** or **C49.4**); lymphoma; **metastasis**; benign tumor	**CT/MRI**; biopsy per **sarcoma-center planning**
Peripheral nerve mass in NF1	**Malignant peripheral nerve sheath tumor** vs benign neurofibroma	**MRI**; **FDG-PET** to assess for malignant transformation; **sarcoma-center referral**
GI tract submucosal mass	**GIST** (**C49.A** series) vs leiomyoma/ leiomyosarcoma vs other	**Endoscopy/imaging**; histology with KIT/DOG1; GIST is **imatinib-eligible** and coded distinctly
Skin/soft tissue lesion in immunosuppression	**Kaposi sarcoma**; angiosarcoma; cutaneous metastasis	**Biopsy;** HIV status; dermatology/ oncology referral

ABBREVIATIONS: MRI = magnetic resonance imaging; CT = computed tomography; UPS = undifferentiated pleomorphic sarcoma; NF1 = neurofibromatosis type 1; FDG-PET = fluorodeoxyglucose positron emission tomography; MPNST = malignant peripheral nerve sheath tumor; GI = gastrointestinal; GIST = gastrointestinal stromal tumor; KIT = KIT proto-oncogene; DOG1 = discovered on GIST-1; HIV = human immunodeficiency virus

Comorbidity Screening

CONDITION	PREVALENCE/ASSOCIATION*[52–54]	SCREENING APPROACH*[15,18,55,56]
Cardiovascular disease (I10, I25.-, I50.-)	CVD present in ~**39%** of STS inpatients (HTN **35.5%**, CAD **8.5%**, HF **4.5%**)	**Baseline echocardiography** and **LVEF monitoring** before/along anthracycline therapy; control hypertension
Venous thromboembolism/ pulmonary embolism	**PE/pulmonary hypertension** associated with **~3-fold** higher in-hospital mortality (aOR 3.02; 95% CI 2.44-3.73)	**VTE prophylaxis** and monitoring, especially perioperatively
Depression and anxiety (F32.-, F41.-)	Significantly **more common in STS patients** than cancer-free controls	**Screen** (PHQ-2/PHQ-9); address to support adherence, consent capacity, and quality of life
Renal impairment (N18.-)	Independently associated with **worse prognosis**; affects chemotherapy dosing	Calculate **estimated creatinine clearance** (not creatinine alone) for **all dosing decisions**
Cognitive impairment (G31.84, F03.-)	**Affects**: adherence, consent capacity, and medication management	Include **cognitive screen** (e.g., Mini-Cog) within geriatric assessment

CONDITION	PREVALENCE/ASSOCIATION*[52–54]	SCREENING APPROACH*[15,18,55,56]
Malnutrition/low BMI (E44.-, R63.4)	Low BMI is an independent negative prognostic factor for OS **in older STS patients**	Incorporate **nutritional assessment** (e.g., Mini Nutritional Assessment) into the workup
Polypharmacy (Z79.-)	Chemotherapy carries **major drug-drug interactions** in older adults (e.g., pazopanib is a CYP3A4 substrate)	Medication reconciliation **each visit**; apply **Beers** and **STOPP/START**; deprescribe where possible
Overall comorbidity burden	Comorbidity raised disease-specific mortality by ~**70%** in **localized STS** (HR 1.70; 95% CI 1.36-2.13)	Optimize comorbidities **before and during treatment** as part of value-based co-management

ABBREVIATIONS: CVD = cardiovascular disease; STS = soft tissue sarcoma; HTN = hypertension; CAD = coronary artery disease; HF = heart failure; LVEF = left ventricular ejection fraction; PE = pulmonary embolism; aOR = adjusted odds ratio; CI = confidence interval; VTE = venous thromboembolism; PHQ = Patient Health Questionnaire; BMI = body mass index; OS = overall survival; CYP3A4 = cytochrome P450 3A4; HR = hazard ratio
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

⚠ RED FLAG — EMERGENCY/ACTIVATE CRISIS RESPONSE

These emergency conditions require **immediate intervention**:

- **Acute hemorrhage from a fungating or necrotic sarcoma mass**: Life-threatening bleeding from skin-invading tumors[57]
  - → **Hemostasis**, emergent surgical oncology consultation, transfusion, ICU if unstable
- **Acute limb ischemia from vascular compression or invasion**: Rapidly enlarging mass compressing major vessels[3]
  - → **Emergent vascular surgery consultation**; CT angiogram; do not delay for biopsy
- **Spinal cord compression** (back pain with progressive weakness or bowel/bladder dysfunction): Paraspinal or metastatic sarcoma (especially myxoid liposarcoma with spinal tropism)[3,58]
  - → **Urgent spinal MRI** (entire spine); high-dose dexamethasone; neurosurgery and radiation oncology consultation
- **Suspected massive pulmonary embolism**: STS patients at elevated VTE risk; PE associated with ~3-fold higher in-hospital mortality in sarcoma inpatients (aOR 3.02)[3,59]
  - → CT pulmonary angiography; anticoagulation; hemodynamic support
- **Febrile neutropenia during chemotherapy** (≥38.3°C or sustained ≥38.0°C, ANC <500): Initiate antibiotics within 1 hour[59,60]
  - → High-risk (MASCC <21): IV broad-spectrum antibiotics and hospitalization; low-risk: consider outpatient oral antibiotics with close follow-up
- **Spontaneous tumor rupture or perforation** (retroperitoneal/intra-abdominal sarcoma): Presents with sepsis, hemorrhage, or acute abdomen; >10% 30-day mortality with emergency surgery[61]
  - → **ICU**; sepsis bundles; stabilize and convert to elective oncologic resection when possible

⚠ RED FLAG — URGENT (SAME- OR NEXT-DAY)

These urgent conditions require expedited evaluation and intervention:

- **Any new mass ≥5 cm, deep to fascia, firm, or rapidly enlarging**: Do not biopsy or excise in primary care; unplanned excision worsens local recurrence (HR 1.74) and survival (HR 1.77)[14]
  - → MRI with contrast; direct sarcoma-center referral
- **Mass excised without imaging/biopsy returning as sarcoma on pathology**: Residual tumor present in >50–83% of re-excision specimens[62,63]
  - → Immediate sarcoma-center referral; delayed consultation >2 months associated with higher metastasis (OR 7.11) and mortality (OR 11.29)
- **New pulmonary nodules on surveillance imaging in known STS**: Lungs are the dominant metastatic site for extremity/trunk STS[3]
  - → Urgent oncology evaluation and chest CT correlation
- **New or changing mass in NF1, Li-Fraumeni, hereditary retinoblastoma, or prior radiation field**: Predisposition syndromes and prior RT sharply raise sarcoma risk[3]
  - → MRI; FDG-PET for suspected MPNST in NF1; sarcoma-center and genetics-clinic coordination
- **Recurrent mass at a prior sarcoma excision site**: ~Two-thirds of local recurrences detected clinically or by patient self-exam[47]
  - → **Imaging and sarcoma-center evaluation**; reinforce self-monitoring education

3 MEAT DOCUMENTATION ESSENTIALS

STS documentation translates a **rare**, **histotype-specific cancer** into a record that supports **timely referral**, **continuity**, and **accurate complexity**. The most common gaps are coding a **suspicious mass** as a benign lipoma (**D17.-**) instead of an interim mass code (**R22.-**) pending biopsy, **under-coding confirmed disease** by omitting anatomic site or laterality, and failing to document the comorbidity and functional burden that defines an **older patient's true complexity**.[64] One analysis found **27% of confirmed myxofibrosarcoma** patients had **no sarcoma ICD code** at all.[65] Each gap **obscures the clinical picture** and **weakens coordination with the sarcoma team**. The MEAT framework below ties **each element into appropriate clinical action**:

Case vignette**: A male patient, 74, presents to his PCP with a firm, painless mass in the right thigh that has slowly enlarged over four months and **now measures about 7 cm**. **PMH**: hypertension on lisinopril, type 2 diabetes, prior coronary stent. Eight regular medications. He walks independently but reports a recent fall and modest **weight loss**. No overlying skin change; routine labs normal. Because he has a suspicious deep soft tissue mass, the accurate code is **C49.21

(malignant neoplasm, connective tissue, right lower limb) ***once malignancy is confirmed****, not* ***D17.72*** *(benign lipoma of lower limb).*

MONITOR: "Weight: 82 kg, down ~4 kg over 4 months. **Functional status**: ambulatory, independent ADLs, one recent fall. G8 = 12 → geriatric vulnerability flagged. Firm, painless 7 cm right-thigh mass deep to fascia, enlarging 4 months → **red-flag finding**; painlessness is **not reassuring**. **Comorbidities**: type 2 diabetes (**E11.-**), hypertension (**I10**), history of falling (**Z91.81**). **Polypharmacy**: eight medications → reconciliation initiated."

EVALUATE: "MRI right lower extremity with contrast ordered (preferred over ultrasound for deep, large masses). **Direct sarcoma-center referral** for image-guided core needle biopsy along planned resection axis = **no in-office excision**. CGA initiated given **G8 ≤14**; estimated creatinine clearance calculated for potential systemic therapy dosing. **Baseline echocardiogram/LVEF** ordered in anticipation of possible anthracycline exposure."

ASSESS: "Suspected malignant soft tissue neoplasm, right lower limb: code **R22.41** now, transitioning to **C49.21** at **pathology confirmation** with laterality documented. Avoid **D17.-** while malignancy is under evaluation. **Associated**: diabetes (**E11.-**) and hypertension (**I10**) affecting treatment tolerance. Weight loss (**R63.4**) → nutritional assessment. G8 = 12 → CGA completed; polypharmacy review indicated. PHQ-2 screened."

TREAT: "**Coordinated urgent sarcoma-center evaluation** for multidisciplinary planning → surgery ± radiation for localized disease. Optimized BP and glycemic control; reviewed cardiac history **before any anthracycline** (dose-dependent cardiotoxicity). **Treatment intensity guided by GA findings**, not age alone. **Dietitian referral** for weight loss. Fall-risk assessment → PT referral. **ACP documented**: surrogate identified, goals assessed. Long-term surveillance and survivorship role established for primary care. Return in 1–2 weeks for imaging results and **sarcoma-center consultation**, or sooner for new symptoms."

Clinical Documentation Elements

- **Document the specific malignancy with a C49.x code** (with anatomic site and laterality) **rather than** nonspecific "sarcoma" or premature benign coding (**D17.-**); once pathology confirms malignancy → nonspecific or benign codes **understate complexity** and impede sarcoma-center coordination[64,65]
- **Use the correct code for the diagnostic phase**: **R22.-** (localized mass) or **D48.1** (uncertain behavior) pending biopsy → transition to the specific **C49.x** subcode at pathology confirmation; **do not** assign **D17.-** (benign lipoma) to a mass under evaluation for malignancy[6,65]
- **Document the mass objectively at presentation**: Size, depth (subcutaneous vs. intramuscular), firmness, mobility, and growth rate → these are the **red-flag features** that support a suspected-malignancy workup and justify imaging[3,14]
- **Distinguish histotype where known**, especially GIST (**C49.A** series), which is coded distinctly and is imatinib-eligible; subtype and site change **both treatment and HCC mapping**[3,6]
- **Record the imaging and biopsy pathway** (MRI with contrast; image-guided core needle biopsy at a sarcoma center; no in-office excision) and the **date of sarcoma-center referral** → documents appropriate triage and **protects against unplanned excision**[3,48]

- **Record functional reserve from a geriatric assessment** (G8 screen, full CGA findings) and document applicable frailty codes (**R54**, **R26.-**, **R63.4**) → GA is a **stronger predictor** of chemotherapy toxicity than age or ECOG alone; guides treatment intensity decisions[18,66]
- **Code each comorbidity at every applicable encounter**: cardiovascular disease (**I25.-**, **I50.-**) affects **anthracycline eligibility**; diabetes (**E11.-**) requires perioperative optimization; renal impairment (**N18.-**) alters chemotherapy dosing; depression (**F32.-**) independently affects adherence and readmission risk[18]
- **Document advance care planning** (CPT 99497/99498), patient goals, surrogate decision-maker, and the surveillance/survivorship plan at each visit → **STS is not** a "hand off and forget" diagnosis; **primary care co-owns long-term recurrence monitoring and functional preservation**[3,18]

Reframing Common Documentation Shortcuts

INSTEAD OF...	DOCUMENT...[3,6,18,46]
'Lipoma, reassured, will observe'	'Firm, painless 7 cm right-thigh mass, deep to fascia, enlarging over 4 months - suspected malignant soft tissue neoplasm (**R22.41**); MRI with contrast ordered; **sarcoma-center referral placed**'
'Soft tissue mass'	'Localized swelling/mass of the right lower limb (**R22.41**) → pending biopsy; do not code **D17.-** while **malignancy is under evaluation**'
'Sarcoma' (site/ laterality omitted)	'Malignant neoplasm, connective/soft tissue, right lower limb (**C49.21**)' → code anatomic site and laterality to the **most specific subcode**
'Unspecified sarcoma' (C49.9) by default	Specify the site; reserve **C49.9** only when the **anatomic site is genuinely undocumented**
'GI tumor' coded as generic C49.x	'Gastrointestinal stromal tumor of stomach (**C49.A2**)' → **GIST has its own C49.A** series and is **imatinib-eligible**
'On chemo'	'Doxorubicin-based systemic therapy (**sarcoma center**); **baseline LVEF assessed**; cumulative anthracycline dose tracked given cardiotoxicity risk'
'Elderly, may not tolerate treatment'	'Geriatric assessment performed: G8 score, functional status, nutrition, polypharmacy → treatment intensity guided by **physiological fitness**, not chronologic age'
'Refer to oncology'	'Referred urgently to a **specialized sarcoma multidisciplinary team** for histotyping and treatment planning' → **general oncology referral alone is insufficient**
'Status post sarcoma resection'	'Personal history of soft tissue malignancy (**Z85.831**); structured surveillance per NCCN (exam + imaging) documented; patient counseled on self-monitoring'

INSTEAD OF...	DOCUMENT...[3,6,18,46]

ABBREVIATIONS: GI = gastrointestinal; MRI = magnetic resonance imaging; GIST = gastrointestinal stromal tumor; LVEF = left ventricular ejection fraction; G8 = Geriatric 8 screening tool; NCCN = National Comprehensive Cancer Network

DOCUMENTATION REMINDER IS COMPREHENSIVE CODING

Every STS-related encounter should document the **mass characteristics** (size, depth, firmness, mobility, growth rate), the **diagnostic phase code** (**R22.-**/**D48.1** pending biopsy; specific **C49.x with site and laterality** at confirmation), the **imaging and sarcoma-center referral pathway**, the **histotype** where known (especially GIST), and the full functional and **comorbidity burden** (performance status, geriatric vulnerabilities, cardiovascular and renal status).[3,6,14,18,44,65] Document the surveillance plan so the record reflects **ongoing PCP-coordinated survivorship care**.[3,67]

4 TREATMENT AND REFERRAL QUICK GUIDE

STS treatment is stage-dependent, histotype-specific, and requires multidisciplinary sarcoma expertise - it is not a single regimen.[4] The PCP's highest-value contributions are shortening diagnostic delay, referring directly to a sarcoma center before any procedure,[3,5] co-managing comorbidities through treatment,[11,12] and coordinating long-term surveillance and survivorship care.[8,9] In older adults the decision lens shifts from chronological to physiological age: functional status - not age - predicts outcomes and toxicity, so a comprehensive geriatric assessment should precede treatment-intensity decisions.[15,16,17]

Therapy Escalation Criteria

TRIGGER[3,14,18,60]	ACTION*[3,18,51,68]
Soft tissue mass >5 cm, deep to fascia, firm, or rapidly growing	Order **MRI with contrast** and **refer directly to a sarcoma center** → **do not** biopsy or excise in office
Indeterminate ultrasound of a soft tissue mass	**Expedite MRI with contrast** and **surgical/orthopedic oncology referral**
Localized disease, biopsy-confirmed	**Sarcoma-center surgery** with oncologically appropriate margins, with or without radiation by stage and grade
High-grade or large (>5 cm) localized tumor	**Neoadjuvant radiation** (category 1) is generally preferred over postoperative RT; consider **neoadjuvant systemic therapy** in selected high-risk cases

TRIGGER[3,14,18,60]	ACTION*[3,18,51,68]
Advanced/metastatic disease, fit patient	First-line anthracycline-based systemic therapy (doxorubicin +/- ifosfamide) **at the sarcoma center**
Advanced disease, patient ≥60 or anthracycline-ineligible	Discuss **pazopanib** as a **non-inferior first-line alternative** with less hematologic toxicity (**EPAZ**)
Confirmed GIST	**Histotype-specific targeted therapy** (imatinib) for unresectable/ metastatic disease = distinct from **other STS pathways**
Frail or vulnerable older adult (abnormal geriatric screen)	**Comprehensive geriatric assessment**; consider dose-reduced or alternative regimens and conservative local therapy aligned with goals
Febrile neutropenia during chemotherapy	**Emergency evaluation**; STS patients on cytotoxic therapy are at risk for **life-threatening infection**
Survivor in surveillance phase	**PCP co-manages structured surveillance** (exam + imaging per NCCN) and **survivorship needs**; reinforce self-monitoring

ABBREVIATIONS: MRI = magnetic resonance imaging; RT = radiation therapy; GIST = gastrointestinal stromal tumor; STS = soft tissue sarcoma; EPAZ = pazopanib-versus-doxorubicin elderly STS trial; NCCN = National Comprehensive Cancer Network; PCP = primary care provider
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

NCCN-Aligned Treatment by Stage, Histotype, and Patient Profile

SETTING/ CLASS[3,18,51,69]	PREFERRED OPTION(S)*[3,51,68,70]	KEY NOTES*[3,18,68,69]
Localized, low grade (Stage IA/IB)	Surgery alone **with appropriate margins**	Adjuvant radiation **generally not required** for low-grade tumors resected with adequate margins
Localized, high grade <=5 cm (Stage II)	**Neoadjuvant RT** (category 1) then surgery, or surgery then **adjuvant RT** (category 1)	Observation may be considered for **<5 cm** tumors resected with wide margins
Localized, high grade >5 cm (Stage III)	**Neoadjuvant RT** (category 1) +/- **neoadjuvant systemic therapy**, then surgery	**Preoperative RT 50-50.4 Gy** is generally **preferred over** postoperative 60-66 Gy (smaller field, less late toxicity)
First-line advanced/ metastatic	**Doxorubicin** 60-75 mg/m^2 IV q21d; or AIM (doxorubicin/ifosfamide/mesna)	**Anthracycline backbone**; not a universal regimen → histotype matters

SETTING/ CLASS[3,18,51,69]	PREFERRED OPTION(S)*[3,51,68,70]	KEY NOTES*[3,18,68,69]
Leiomyosarcoma, advanced	Doxorubicin + **trabectedin** (category per NCCN)	Superior OS vs doxorubicin alone (median 33 vs 24 months; HR 0.65); efficacy maintained in patients ≥70 (median OS 48.9 months) though grade ≥3 AEs in 80%
Older or anthracycline-ineligible, advanced	**Pazopanib** 800 mg daily [**OFF-LABEL first-line** vs anthracycline]	**Noninferior to doxorubicin in patients ≥60** (PFS HR 1.00; 95% CI 0.65-1.53) with significantly less grade 4 neutropenia (**EPAZ**, 2020)
Later-line systemic therapy	**Eribulin** (liposarcoma), trabectedin (liposarcoma/LMS), gemcitabine/ docetaxel, dacarbazine	Selection is **histotype-driven**; sequence per **sarcoma-center plan**
NTRK fusion-positive sarcoma	Larotrectinib, entrectinib, or repotrectinib	Regardless of subtype when an **NTRK fusion is present**
Selected histologies (immunotherapy)	**Pembrolizumab or nivolumab** +/- ipilimumab	**For**: UPS, dedifferentiated liposarcoma, cutaneous angiosarcoma, or TMB-H/MSI-H tumors
Frail/older adults	**Hypofractionated RT or SBRT**; dose-reduced systemic therapy with escalation as tolerated	Reduce treatment burden while preserving function; **align with goals of care**

ABBREVIATIONS: RT = radiation therapy; AIM = doxorubicin/ifosfamide/mesna; OS = overall survival; HR = hazard ratio; AE = adverse event; PFS = progression-free survival; EPAZ = pazopanib-versus-doxorubicin elderly STS trial; LMS = leiomyosarcoma; NTRK = neurotrophic tyrosine receptor kinase; UPS = undifferentiated pleomorphic sarcoma; TMB-H = tumor mutational burden-high; MSI-H = microsatellite instability-high; SBRT = stereotactic body radiation therapy; IV = intravenous; Gy = gray

***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

CLINICAL PEARL - PHYSIOLOGICAL FITNESS > CHRONOLOGIC AGE

Treat by physiological fitness, not chronological age. In the **EPAZ** post-hoc analysis, a **G8 score ≤14** predicted worse PFS (HR 1.82; p=0.009) and more serious adverse events (HR 2.67; p=0.011), and **IADL impairment ≥1** predicted **worse OS** (HR 2.02; p=0.007) - while **chronological age** and the **Charlson Comorbidity Index** did not predict outcomes.[68] In a real-world cohort of patients **≥70**, CGA-defined fitness independently predicted survival: median OS **19.5 months (fit) vs 12.8 (vulnerable) vs 7.8 (frail)**.[71] Performance status was the **strongest survival predictor in elderly patients** receiving chemotherapy (median OS 22.1 vs 4.3 months for PS 0-1 vs 2-3).[72] In a pooled analysis of 12 **EORTC trials**, elderly patients had outcomes only modestly worse than younger patients, underscoring that **age alone should not preclude treatment**.[73] Functional assessment, **not age**, should drive treatment intensity.[17,18]

Non-Pharmacologic Care and Supportive Interventions

INTERVENTION	TARGET/ RECOMMENDATION[3,17,47,74]	NOTES[3,47,53]
Prehabilitation/PM&R consultation	**Refer before** limb-sparing surgery or amputation to **set functional goals**	NCCN recommends PM&R consultation and longitudinal functional follow-up
Comprehensive geriatric assessment	Functional status, cognition, nutrition, comorbidity, social support, polypharmacy	**Foundation of value-based decision-making**; abnormal screen triggers full assessment
Nutritional optimization	Assess and address **malnutrition** (e.g., Mini Nutritional Assessment)	Low BMI is an **independent negative prognostic factor for OS** in older STS
Falls and mobility program	**Fall screen**; physical therapy for balance and strength	Supports the Age-Friendly '**Mobility**' **aim** and safe treatment delivery
Structured surveillance education	Teach **self-monitoring** for new or changing masses	About **two-thirds** of local recurrences are first detected clinically **by patients** or **on exam**
Smoking cessation and comorbidity control	**Optimize**: cardiovascular, metabolic, and renal status	Comorbidity raises STS disease-specific mortality **~70%** in localized disease
Advance care planning	**Document**: directives, surrogate, and goals; revisit through treatment	Especially relevant in **advanced disease** and **frail older adults**

ABBREVIATIONS: BMI = body mass index; PM&R = physical medicine and rehabilitation; OS = overall survival; STS = soft tissue sarcoma

Medication Safety and Key Interactions

DRUG/CLASS	INTERACTION/TOXICITY*[75–78]	CLINICAL ACTION*[15,17,18,79]
Doxorubicin (anthracycline)	**Dose-dependent cardiotoxicity**; cumulative doses **>550 mg/m^2** sharply increase cardiomyopathy risk; myelosuppression	**Baseline and serial LVEF**; track **cumulative dose**; the FDA label advises considering lower doses in elderly patients
Ifosfamide	**Nephrotoxicity**, hemorrhagic cystitis, encephalopathy; requires adequate **renal function** (CrCl typically **>60 mL/min**)	**Mesna uroprotection**; calculate creatinine clearance; monitor renal function and mental status
Pazopanib (OFF-LABEL first-line vs anthracycline)	**Hypertension** (class effect), hepatotoxicity, QT prolongation; **CYP3A4 substrate** with many interactions	**Monitor blood pressure and LFTs**; review interacting medications; reconcile polypharmacy
Trabectedin	Hepatotoxicity, myelosuppression, rhabdomyolysis; **high grade ≥3 AE rate** in older patients	**Specialist-managed**; monitor LFTs, CBC, and CK; supportive dexamethasone per protocol
Imatinib (for GIST)	**Edema**, cytopenias, hepatotoxicity; **CYP3A4 interactions**	Reserve for **confirmed GIST** (**C49.A**); monitor CBC and LFTs; review **drug interactions**
Eribulin/ gemcitabine-docetaxel	**Myelosuppression**, neuropathy (eribulin); pneumonitis risk (docetaxel)	**Histotype-specific later-line use**; standard cytotoxic monitoring
Polypharmacy in older adults	Anticholinergic burden, sedation, and interactions **raise toxicity and fall risk**	**Medication reconciliation each visit**; apply **Beers** and **STOPP/ START**; deprescribe where possible

ABBREVIATIONS: AE = adverse event; LVEF = left ventricular ejection fraction; CrCl = creatinine clearance; CYP3A4 = cytochrome P450 3A4; LFT = liver function test; CBC = complete blood count; CK = creatine kinase; GIST = gastrointestinal stromal tumor; FDA = Food and Drug Administration; QT = QT interval
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

When to Refer

CRITERION[3,14,51,80]	SPECIALIST	URGENCY[3,46,48,80]
Acute hemorrhage, limb ischemia, or cord compression from a sarcoma mass	Emergency department	**Emergent**
Febrile neutropenia during chemotherapy	Emergency department/ oncology	**Emergent**

CRITERION[3,14,51,80]	SPECIALIST	URGENCY[3,46,48,80]
New mass >5 cm, deep to fascia, firm, or rapidly growing	Sarcoma multidisciplinary center (after MRI ordered)	**Urgent** (same-day to days)
Prior unplanned excision now confirmed sarcoma	Sarcoma center (re-staging/ re-excision)	**Urgent** (within days)
New pulmonary nodules in known STS	Oncology	**Urgent** (within days)
Any mass deep to the fascia, regardless of size	Sarcoma center (before any procedure)	Expedited (within days)
Indeterminate ultrasound of a soft tissue mass	Surgical/orthopedic oncology	Expedited (within days)
New mass in NF1/Li-Fraumeni/hereditary retinoblastoma	Sarcoma center; genetics	Expedited (within days)
Confirmed GIST	Sarcoma/GI oncology (imatinib pathway)	Routine-expedited
Frail older adult before treatment	Geriatric oncology/ geriatrics	Routine
Advanced disease with high symptom burden	Palliative care	Routine-expedited

ABBREVIATIONS: GI = gastrointestinal; GIST = gastrointestinal stromal tumor; MRI = magnetic resonance imaging; NF1 = neurofibromatosis type 1; STS = soft tissue sarcoma

Follow-Up Timing

CATEGORY	FREQUENCY*[3,17,79,81]	LABS/MONITORING*[15,47,82]
High-grade STS surveillance	Exam + chest imaging and primary-site imaging **q3-6 months** for years 1-3; **q6 months** years 3-5; then **annually**	Most local recurrences (**~two-thirds**) detected clinically → reinforce **patient self-monitoring**
Low-grade STS surveillance	**Less intensive than high-grade**; exam + imaging at longer intervals per NCCN	Individualized after 10 years; tailor to recurrence risk by grade and size
Post-resection survivorship	Integrate surveillance into **routine PCP visits**	Document **Z85.831**; coordinate imaging results with the **sarcoma center**

CATEGORY	FREQUENCY*[3,17,79,81]	LABS/MONITORING*[15,47,82]
Anthracycline cardiac monitoring	**Baseline and serial LVEF**; track cumulative dose	Cumulative doxorubicin >550 mg/m^2 **raises cardiomyopathy risk**
Renal function during therapy	Estimated creatinine clearance **before and during nephrotoxic agents**	Use **calculated CrCl**, not serum creatinine alone, for dosing
Geriatric vulnerabilities	Reassess functional status, nutrition, cognition, and polypharmacy	Abnormal change prompts **treatment-plan review with oncology**
Comorbidity control	**Each visit** (BP, glucose, cardiac, mental health)	Comorbidity **independently worsens STS prognosis**

ABBREVIATIONS: BP = blood pressure; CrCl = creatinine clearance; LVEF = left ventricular ejection fraction; NCCN = National Comprehensive Cancer Network; PCP = primary care provider; STS = soft tissue sarcoma
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Comorbidity Management

COMORBIDITY	PCP APPROACH*[3,15,17,18,55]	CAUTION*[3,52,83]
Cardiovascular disease (I10, I25.-, I50.-)	**Optimize BP and cardiac status**; baseline echocardiography **before** anthracyclines	CVD present in **~39%** of STS inpatients; anthracyclines are cardiotoxic → **monitor LVEF**
Venous thromboembolism risk	**VTE prophylaxis perioperatively**; maintain a **low threshold for PE evaluation**	PE/pulmonary hypertension carried **~3-fold higher** in-hospital mortality in sarcoma patients
Renal impairment (N18.-)	Calculate CrCl for **all chemotherapy dosing**; adjust nephrotoxic agents	Renal disease **independently worsens prognosis**; critical for ifosfamide
Depression/anxiety (F32.-, F41.-)	**Screen and treat**; support adherence and decision-making capacity	**More common in STS** than in cancer-free controls; affects consent and QoL
Malnutrition/low BMI (E44.-)	**Nutritional assessment** and support	Low BMI is an **independent negative prognostic factor** for OS
Polypharmacy (Z79.-)	Medication reconciliation **each visit**; deprescribe per **Beers**/**STOPP-START**	Chemotherapy has major interactions (e.g., pazopanib **CYP3A4**); **reduce avoidable risk**

COMORBIDITY	PCP APPROACH*[3,15,17,18,55]	CAUTION*[3,52,83]
Cognitive impairment (G31.84)	Screen within **geriatric assessment**; involve caregivers	**Affects**: adherence, consent, and medication safety

ABBREVIATIONS: BMI = body mass index; BP = blood pressure; CrCl = creatinine clearance; CVD = cardiovascular disease; CYP3A4 = cytochrome P450 3A4; LVEF = left ventricular ejection fraction; OS = overall survival; PE = pulmonary embolism; QoL = quality of life; STS = soft tissue sarcoma; VTE = venous thromboembolism
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Cost-Smart Options

Therapy selection for STS is **primarily the responsibility of sarcoma multidisciplinary centers**, but PCP awareness of **systemic therapy costs**, **toxicity profiles**, and **value-based alternatives** is important for co-managing treatment-related side effects, supporting shared decision-making in older adults, and coordinating **cost-conscious survivorship care**.[3,15] The table below identifies cost-smart strategies relevant to the **PCP's role in value-based STS management**.

BRAND (EST. COST)*[84–88]	GENERIC/ALTERNATIVE (EST. COST)*[3,66,89–91]	EST. SAVINGS	COST-SMART TIP*[18,84,87,88,92]
Doxorubicin 75 mg/m^2 IV q21d × 6 cycles (~$150–$300/cycle drug; generic) + infusion charges (~$2,000–$4,000/cycle)	Pazopanib 800 mg PO daily (**~$12,000–$15,000/month**) for patients ≥60 or anthracycline-ineligible	Variable; fewer toxicity admissions	FDA-approved for advanced STS **after prior chemo**; noninferior PFS in ≥60 (**EPAZ**) with less grade 4 neutropenia; oral route eliminates infusion visits
AIM inpatient administration (~$15,000–$25,000/cycle including 4–6 day hospitalization)	**Outpatient** (**IPOP**) ifosfamide (**~$5,000–$10,000/cycle**)	**~$2.1M** saved over **57 patients** at one center	Saved **783 hospital days** with comparable toxicity and **>90% completion**; advocate for sarcoma centers with **ambulatory capability**
Full-dose systemic therapy in frail older adults (grade 3–5 AEs 71%; rehospitalization ~$5,000–$25,000+)	GA-guided dose reduction with escalation as tolerated	Variable; **$10,000–$50,000+** per prevented hospitalization	**GAP70+** cut grade 3–5 toxicity to **51%** without harming survival; 2026 cost-utility analysis **confirmed cost-effectiveness**

BRAND (EST. COST)*[84–88]	GENERIC/ALTERNATIVE (EST. COST)*[3,66,89–91]	EST. SAVINGS	COST-SMART TIP*[18,84,87,88,92]
Standard 5-week preoperative RT (50 Gy/25 fractions; ~25 visits)	**Hypofractionated RT** (42.75 Gy/15 fractions over 3 weeks; or 30 Gy/5 fractions over 1 week)	~10–20 fewer visits; **reduced travel burden**	**HYPORT-STS** phase 2 showed **comparable local control**; not yet routine per ESTRO/ASTRO 2026 but growing evidence
Trabectedin 1.5 mg/m^2 IV q21d (~$8,000–$12,000/cycle; 24-hour infusion, central line)	Pazopanib 800 mg PO daily (**~$12,000–$15,000/month**) second-line	Comparable PFS; lower infusion burden	**JCOG1802**: pazopanib had best PFS and OS among **second-line options**; oral route **eliminates central line and 24-hour infusions**
Late or no palliative care (~$5,000–$25,000+ per avoidable hospitalization)	Early integrated palliative care (**~$500–$1,500/year** PCP-coordinated)	Variable; **reduced hospitalizations** and **aggressive EOL care**	ASCO recommends early PC for advanced cancer; Cochrane review showed **improved QOL** and lower symptom intensity
Radical resection when limb function threatened in frail patients (~$30,000–$60,000 + rehab)	Conservative surgery, RT alone, or hypofractionated RT **aligned with goals**	**~$20,000–$40,000** per avoided major surgery	**Function-preserving therapy** may better serve value in **frail adults**; guide intensity by GA, not age

ABBREVIATIONS: AIM = doxorubicin/ifosfamide/mesna; IV = intravenous; PO = by mouth; FDA = Food and Drug Administration; PFS = progression-free survival; EPAZ = pazopanib-versus-doxorubicin elderly STS trial; STS = soft tissue sarcoma; IPOP = inpatient-on-outpatient protocol; AE = adverse event; GA = geriatric assessment; RT = radiation therapy; Gy = gray; HYPORT-STS = hypofractionated preoperative radiation therapy for soft tissue sarcoma trial; ESTRO = European Society for Radiotherapy and Oncology; ASTRO = American Society for Radiation Oncology; OS = overall survival; ASCO = American Society of Clinical Oncology; PC = palliative care; QOL = quality of life; EOL = end of life; CARG = Cancer and Aging Research Group; CRASH = Chemotherapy Risk Assessment Scale for High-Age patients; SBRT = stereotactic body radiation therapy; VBC = value-based care
***Costs are approximate US estimates and vary by institution, payer, and region. Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Patient Education and Adherence

STS education should convey that most soft tissue lumps are benign, but a lump ≥5 cm, deep, firm, growing, or painful warrants prompt evaluation; a painless lump is not reassuring.[3,14] MRI and biopsy are needed **before any mass is removed**; unplanned excision can **compromise limb-sparing surgery**.[3,29] **Surveillance is long-term**: roughly two-thirds of extremity local recurrences

are first detected by patients or on exam, making self-monitoring essential.[47,93] **For older adults**, reinforce that geriatric assessment tailors care to fitness, not age, and that goals-of-care conversations should occur early.[17,18,91]

DOCUMENTATION REMINDER - PATIENT EDUCATION

Document topics covered, patient/caregiver(s) present, materials provided, and understanding (**teach-back**):

- **Diagnosis in plain language**: STS is rare and heterogeneous; localized disease is often curable with surgery ± radiation; advanced disease is treated to control symptoms and prolong life
- **Red-flag mass features**: Mass ≥5 cm, deep to fascia, firm/fixed, or rapidly growing warrants urgent evaluation; new mass in a prior radiation field or in NF1 requires prompt imaging
- **Painless does not mean benign**: Most STS present as painless lumps; absence of pain must not delay imaging or referral
- **Imaging-then-biopsy sequence**: MRI before excision; core needle biopsy at or coordinated with a sarcoma center; unplanned excision compromises tissue planes
- **Treatment toxicity awareness**: Doxorubicin — report new dyspnea, fatigue, edema; ifosfamide — nephrotoxicity, encephalopathy; pazopanib — hepatotoxicity, hypertension; preoperative RT — wound complications
- **Surveillance and self-monitoring**: Monthly self-palpation of surgical site; report any new or changing lump promptly; chest imaging detects asymptomatic lung metastases amenable to metastasectomy
- **Geriatric assessment rationale**: GA-guided adjustments reduce grade 3–5 toxicity (71% → 51%) without compromising survival; functional reserve and goals determine the plan
- **Palliative care as part of the plan**: Controls symptoms alongside treatment; early palliative care in STS reduces aggressive end-of-life interventions
- **Advance care planning**: Surrogate, code status, goals of care; revisit at progression, hospitalization, or functional decline; CPT 99497/99498 billable during AWV
- **Caregiver assessment**: Document caregiver understanding of warning symptoms and medication schedule; screen for caregiver burden

Quality Metrics Tie-In

No STS-specific HEDIS or MIPS measures are active in MY2026, but STS management intersects cross-cutting quality domains: depression screening, geriatric safety, care transitions, and advance care planning.[3,18] Depression symptoms affect **~35%** of sarcoma patients, 30-day readmission ranges from **5–8%** (extremity) to **~13%** (retroperitoneal), and polypharmacy (≥5 medications) affects **~61%** of older adults with advanced cancer; these collective features make national measures **directly applicable to PCPs managing STS in value-based programs**.[52,66,94–96]

MEASURE	STANDARD	APPLICABILITY TO STS*
HEDIS CBP: Controlling High Blood Pressure	**Denominator**: adults 18–85 with hypertension **Numerator**: BP 140/90 mmHg; **Exclusions**: hospice, ESRD, inpatient palliative care	**STS patients**: doxorubicin cardiotoxicity compounded by **uncontrolled hypertension**[15,97]
HEDIS COA: Care for Older Adults- Medication Review	**Denominator**: MA enrollees ≥66, continuously enrolled **Numerator**: 2 sub-measures documented annually: (**1**) functional status assessment, (**2**) medication review, **Exclusions**: hospice, ESRD	**61%** of older cancer patients on **≥5 medications**; doxorubicin, ifosfamide, and pazopanib require **interaction screening**[18,96]
HEDIS COA: Care for Older Adults - Functional Status Assessment	**Denominator**: enrollees ≥66 **Numerator**: functional status assessment documented annually **Exclusions**: hospice, ESRD	**G8/ECOG satisfy this sub-measure**; GA-guided care cut grade 3–5 toxicity (**71%→51%**) without harming survival[17,66]
HEDIS TRC: Transitions of Care Patient	**Denominator:** enrollees ≥18 with inpatient discharge **Numerator:** 4 sub-measures within 30 days: (**1**) notification of inpatient admission, (**2**) receipt of discharge information, (**3**) patient engagement after discharge, (**4**) medication reconciliation post-discharge **Exclusions:** hospice	Readmission **5–8%** (extremity), **~13%** (retroperitoneal); comorbidity burden and depression increase risk; **PCP follow-up within 7 days** reduces risk[94,98]
HEDIS DMS-E: Utilization of the PHQ-9 to Monitor Depression Symptoms for Adolescents and Adults†	**Denominator:** enrollees ≥12 with diagnosis of major depression or dysthymia AND elevated PHQ-9 ≥10 **Numerator:** follow-up PHQ-9 documented within 4–8 months of index elevated score **Exclusions:** hospice	Depression in **~35%** of sarcoma patients; highest during treatment and at recurrence; **independently associated with readmission**[52]
HEDIS ACP: Advance Care Planning	**Denominator:** enrollees ≥66 **Numerator:** advance care plan or surrogate decision-maker documented, **OR** documentation that ACP was discussed but patient declined **Exclusions:** hospice	Early palliative care r**educes aggressive EOL care** in STS; CPT 99497/99498 billable during AWV‡[91]

MEASURE	STANDARD	APPLICABILITY TO STS*
HEDIS PCR: Plan All-Cause Readmission	**Denominator:** enrollees ≥18 with acute inpatient discharge **Numerator:** unplanned readmission within 30 days (lower is better) **Exclusions:** planned readmissions (maintenance chemotherapy, transplant), hospice, psychiatric	**Surgical complications** are the primary readmission driver; **transitional care management** reduced readmission from **23.5%** to **18.5%** in a cancer-center pilot[99]

ABBREVIATIONS: BP = blood pressure; ESRD = end-stage renal disease; STS = soft tissue sarcoma; MA = Medicare Advantage; PCP = primary care provider; PHQ-9 = Patient Health Questionnaire-9; G8 = Geriatric 8 screening tool; ECOG = Eastern Cooperative Oncology Group; GA = geriatric assessment; EOL = end of life; CPT = Current Procedural Terminology; AWV = Annual Wellness Visit; HEDIS = Healthcare Effectiveness Data and Information Set; CBP = Controlling High Blood Pressure; COA = Care for Older Adults; TRC = Transitions of Care; DMS-E = Utilization of the PHQ-9 to Monitor Depression Symptoms for Adolescents and Adults; ACP = advance care planning; PCR = Plan All-Cause Readmission; FDA = US Food and Drug Administration
***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**
†Medicare Part B covers PHQ-9 screening during the AWV (G0438/G0439) and depression screening (G0444) with no patient cost-sharing
‡ACP is covered with no patient copay during the AWV; 99497 covers the first 30 minutes, 99498 each additional 30 minutes

5 CODING REMINDERS AND CASE EXAMPLES

Coding Specificity

ELEMENT[3,6,51]	DOCUMENTATION REQUIREMENT[3,6,31]
Diagnostic-phase coding	Pending biopsy, use **R22.-** (localized mass) or **D48.1** (uncertain behavior) with 'suspected malignancy'; **do not assign D17.-** (benign lipoma) to a mass **under evaluation**
Site and laterality at confirmation	Code the specific **C49.x** subcode with anatomic site and laterality (e.g., **C49.21** right lower limb); replace **unspecified C49.10/C49.20/C49.9** once known
Anatomic site drives the HCC	Extremity/trunk **C49.x** maps to **HCC 21** (RAF 0.671); abdominal **C49.4** and GIST **C49.A** to **HCC 23** (RAF 0.186); retroperitoneal **C48.x** to **HCC 20** (RAF 1.136)
GIST coded distinctly	Use the **C49.A0-C49.A9** series for GIST by site, **never generic C49.x**; histology plus site required
Avoid premature benign or unspecified codes	Under-coding to **D17.-** or **R22.-** = **coding error**; reserve **C49.9** only for genuinely undocumented site

ELEMENT[3,6,51]	DOCUMENTATION REQUIREMENT[3,6,31]
Personal history after treatment	**Z85.831** (personal history of soft tissue malignancy) supports medical necessity for **surveillance**
Comorbidities - frequently undercoded	Hypertension (**I10**), diabetes (**E11.-**), CKD (**N18.-**), depression (**F32.-**), malnutrition (**E44.-**), long-term drug therapy (**Z79.-**)
Definitive diagnostic language	Document malignancy only **after pathology confirmation**; imaging triages but **does not confirm STS**

ABBREVIATIONS: CKD = chronic kidney disease; GIST = gastrointestinal stromal tumor; HCC = Hierarchical Condition Category; ICD-10 = International Classification of Diseases, 10th Revision; RAF = Risk Adjustment Factor; STS = soft tissue sarcoma

Annual Clinical Review and Confirmation

- **Annual review**: A confirmed STS in active treatment or surveillance must be **reassessed annually with MEAT** → histotype, FNCLCC grade, anatomic site/laterality, treatment status, surveillance findings, and comorbidity burden
- **Visit modality**: Face-to-face **or** synchronous telehealth qualifies; chart updates without an encounter **do not satisfy MEAT**
- **Site-code verification**: Before accepting **C49.9**, confirm site from pathology/imaging: extremity → **C49.11**/**C49.12**/**C49.21**/**C49.22** with laterality; retroperitoneal → **C48.0** (not **C49.4**); GIST → **C49.A** series
- **Active disease vs. history**: **Z85.831** applies only after oncology documents **no evidence of disease** and closes surveillance; patients on active treatment or post-resection surveillance **retain the active C49.x code**
- **Stage and treatment confirmation**: Re-document **AJCC stage**, **FNCLCC grade**, treatment **status** (neoadjuvant, surgical, adjuvant, palliative), and **metastatic-site codes** (**C78.00**–**C78.02** lung) at each review → grade and stage drive observation vs. radiation vs. systemic therapy decisions
- **Comorbidity carry-forward**: Confirm treatment-shaping comorbidities remain on the problem list and are independently coded annually: diabetes (**E11.-**), hypertension (**I10**), CKD (**N18.-**), heart failure (**I50.-**), frailty (**R54**), falls (**R29.6**), malnutrition (**E44.-**), functional limitations (**R26.-**, **R41.-**)
- **HCC mapping context**: Anatomic site **determines the HCC**: most extremity/trunk STS (**C49.0–C49.9** excluding **C49.4/C49.A**) → **HCC 21** (CNA RAF 0.671); abdominal STS (**C49.4**) and GIST (**C49.A**) → **HCC 23** (CNA RAF 0.186); retroperitoneal/peritoneal (**C48.x**) → **HCC 20** (CNA RAF 1.136)

- **Avoid rollover**: **Do not** copy forward **without updating**: Site code/specificity, disease status, stage/grade, treatment phase, metastatic sites, surveillance findings, geriatric scores, and comorbidity burden

Good Documentation - EHR Tips

- **EHR TIP — Smartphrase]** Build a **.sts_eval dot phrase** that **auto-populates**: red-flag findings (size in cm, depth relative to fascia, firmness, growth rate), interim code (**R22.-** with site/laterality), MRI order (73220/73720), sarcoma-center referral with "**do not excise in office**," and **G8 trigger if ≥65**. Separate .**sts_confirmed phrase**: site-specific code (**C49.21**, **C48.0**, etc.), histologic subtype/FNCLCC grade, AJCC stage, disease status, treatment regimen, metastatic-site codes (**C78.00** lung), cumulative doxorubicin dose, baseline LVEF, and comorbidities (**E11.-**, **I10**). Separate **.sts_survivor phrase**: stage at diagnosis, last imaging/result, NCCN surveillance interval, self-monitoring education documented. **Eliminates nonspecific "sarcoma" entries** and premature **D17.-** coding
- **[EHR TIP — Alert]** "**Specificity Check**" = flags **D17.-** or **C49.9** when imaging/pathology suggests malignancy; flags **C49.4** (abdomen) when operative report documents retroperitoneal origin (should be **C48.0**). "**Interim Code Transition**" = flags **R22.-**/**D48.1 persisting >30 days** to prompt **C49.x** transition at pathology. "**Laterality Guard**" = flags unspecified **C49.10**/**C49.20** when laterality is documented in imaging. "**Active vs. History Guard**" = flags **Z85.831** while antineoplastic therapy or surveillance imaging remains active
- **[EHR TIP — Best Practice]** Pin site-specific **C49.x** with **grade** and **status** (e.g., "High-grade leiomyosarcoma, right thigh, **C49.21**, Stage III, active, on neoadjuvant radiation"), **not** "**sarcoma**." **Code comorbidities individually**. Distinguish retroperitoneal **C48.0** (**HCC 20**, RAF 1.136) from abdominal **C49.4** (**HCC 23**, RAF 0.186) → verify origin on imaging/operative report. Reserve **Z85.831** only after oncology documents **no evidence of disease**
- **[EHR TIP — Workflow] Fire BPA when**: G8/VES-13 **not completed in patient ≥65 before treatment**; baseline **LVEF absent before anthracycline**; creatinine clearance **not calculated** before ifosfamide; cumulative doxorubicin approaching 450 mg/m^2; biopsy **not documented** before resection; sarcoma-center **referral not placed** for deep or ≥5 cm mass; advance care planning **undocumented** in advanced disease; **no MEAT encounter in 6 months**. Flag **D17.-** assigned to any mass ≥5 cm or deep to fascia
- **[EHR TIP — Order Set]** "**STS Mass Workup**": MRI extremity with/without contrast, sarcoma-center referral, core needle biopsy (site-specific), CT chest, G8 screen (if ≥65), medication reconciliation, creatinine clearance. "**STS Staging**": CT chest, FDG-PET/CT (if indicated for grading or MPNST differentiation), baseline LVEF (if anthracycline planned), genetic counseling (if Li-Fraumeni/NF1/RB1 suspected), full CGA (if G8 ≤14). "**STS Surveillance**": Exam and imaging per NCCN intervals (every 3–6 months × 2–3 years, then every 6–12 months to year 10), CT chest, site MRI, self-monitoring teach-back documented, comorbidity and geriatric reassessment

Brief Case Example

SUCCESS: RED FLAG RECOGNIZED, PROMPT REFERRAL, GERIATRIC-INFORMED CARE

SCENARIO

A 74-year-old male with a firm, **painless 7 cm right-thigh mass**, deep to the fascia, **enlarging over four months**. PMH: hypertension, type 2 diabetes, prior coronary stent. Eight chronic medications; one recent fall.

Documentation: "Firm, painless 7 cm right-thigh mass deep to fascia, enlarging over 4 months → red flag for malignancy; MRI right lower extremity with contrast ordered, **direct sarcoma-center referral placed**; **no in-office excision**. **R22.41**: Localized swelling, mass, lump, right lower limb, pending biopsy. **E11.65**: Type 2 diabetes → optimized perioperatively. **I10**: Hypertension → optimized perioperatively. **G8 score 12** → full CGA ordered. Medication reconciliation and estimated creatinine clearance completed. Pathology confirmed high-grade soft tissue sarcoma. **C49.21**: Active malignant neoplasm of connective tissue, right lower limb (high-grade STS, [pathology date]). Core needle biopsy along planned resection axis; limb-sparing surgery with neoadjuvant radiation **at sarcoma center**. **Baseline LVEF documented** before any anthracycline consideration. **Advance care planning documented**: directives, surrogate, goals reviewed. Care coordinated across surgical oncology, radiation oncology, geriatric oncology, and primary care. Return [interval] or sooner for new symptoms."

Outcome: C49.21 (HCC 21) + **E11.65** + **I10** mapped with full clinical course documented. **MEAT elements present**: deep enlarging mass identified as malignancy red flag, urgent MRI ordered at index visit, sarcoma-center referral within days (**no in-office excision**), tissue diagnosis confirmed via core needle biopsy along resection axis and coded as active **C49.21**, geriatric assessment (G8 with CGA) informing function-preserving treatment plan, baseline LVEF **documented before potential anthracycline**, comorbidities coded and linked to perioperative optimization, polypharmacy reviewed, creatinine clearance calculated, advance care planning completed, and multidisciplinary coordination documented. **No avoidable diagnostic delay** or premature benign coding.

PITFALL: BENIGN ASSUMPTION, DELAYED REFERRAL, NON-SPECIFIC CODING

SCENARIO

Same patient as above. Presents for routine follow-up with identical findings.

Documentation as written: "74-year-old with a thigh lipoma, soft tissue. Reassured, will observe. Benign lipoma (**D17.72**)."

Consequence: (**1**) A deep, firm, enlarging 7 cm mass was **coded as a benign lipoma** and observed without imaging or biopsy = the "watch and wait" trap. (**2**) Painlessness was **treated as reassuring** despite a clear red-flag presentation; most soft tissue sarcomas are painless in early stages, and **absence of pain must not delay imaging** or referral. (**3**) "Will observe" replaced urgent MRI and sarcoma-center referral, allowing months of diagnostic delay that narrowed limb-salvage options. (**4**) **D17.72** used instead of **R22.41** (pending biopsy) or **C49.21** (at confirmation), rendering the malignancy invisible. (**5**) No geriatric assessment, medication reconciliation, cardiac baseline, advance care planning, or multidisciplinary coordination documented.

RAF Impact: D17.- maps to **no HCC** and zero RAF, so a malignancy under evaluation was rendered invisible to risk adjustment. Had the mass been coded as **R22.41** (suspected malignancy, pending biopsy) and then transitioned to **C49.21** at pathology confirmation, it would map to **HCC**

21 (CNA RAF 0.671), **accurately representing the patient's clinical complexity** and the correct pathway would have **shortened the diagnostic delay**.

Fix: Corrected documentation: "Firm, painless 7 cm right-thigh mass, deep to fascia, enlarging over 4 months → cross-sectional imaging and sarcoma-center referral now, not watchful waiting; do not excise in office. **R22.41**: Localized swelling, mass, lump, right lower limb → suspected malignant soft tissue neoplasm, pending biopsy. → **C49.21**: Active malignant neoplasm of connective tissue, right lower limb (high-grade STS, confirmed [date]). **E11.65**: Type 2 diabetes → perioperative optimization. **I10**: Hypertension → perioperative optimization. G8 score [value] → CGA if ≤14. **Baseline LVEF documented**. Advance care planning: directives, surrogate, goals documented. Return [interval] or sooner for new symptoms." Coding after fix: **C49.21** (HCC 21) + **E11.65** + **I10** replaces **D17.72** = malignancy-specific, active-disease coding with **full clinical picture preserved**, geriatric complexity accounted for, and **no premature benign label** applied to an unevaluated mass.

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