Oncology Clinical Pathways
Bone Sarcoma

April 2025 – V1.2025

Table of Contents

Soft Tissue Sarcoma – Presumptive Conditions

VA automatically presumes that certain disabilities were caused by military service. This is because of the unique circumstances of a specific Veteran's military service. If a presumed condition is diagnosed in a Veteran within a certain group, they can be awarded disability compensation.

Atomic Veterans Exposed to Ionizing Radiation

- Bone cancer

Gulf War and Post 9/11 Veterans

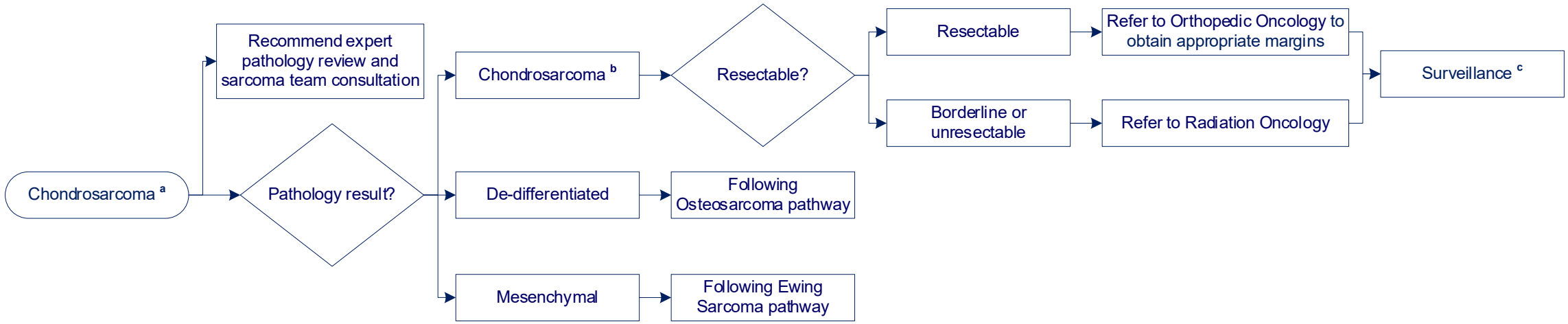
If the patient served on or after Sept. 11, 2001, in Afghanistan, Djibouti, Egypt, Jordan, Lebanon, Syria, Uzbekistan, or Yemen or if you served in the *Southwest Asia theater of operations, or Somalia, on or after Aug. 2, 1990, specific conditions include:

- Head cancer of any type
- Neck cancer of any type

* The Southwest Asia theater of operations refers to Iraq, Kuwait, Saudi Arabia, the neutral zone between Iraq and Saudi Arabia, Bahrain, Qatar, the United Arab Emirates, Oman, the Gulf of Aden, the Gulf of Oman, the Persian Gulf, the Arabian Sea, the Red Sea, and the airspace above these locations.

For more information, please visit U.S. Department of Veterans Affairs - Presumptive Disability Benefits (va.gov)

Bone Sarcoma – Chondrosarcoma



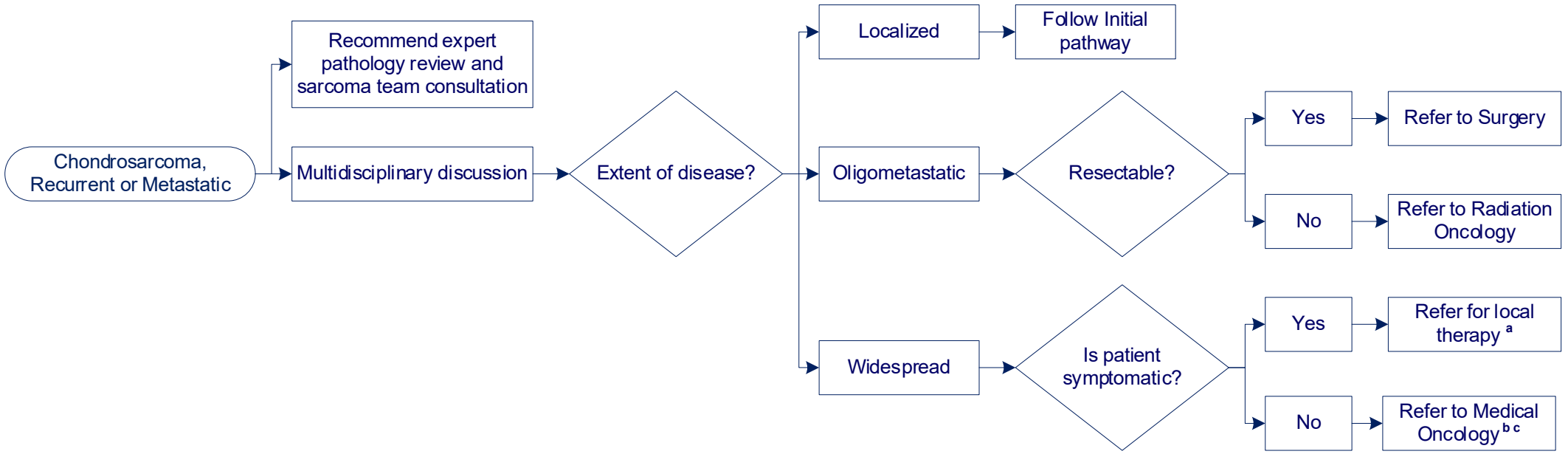
Clinical trial(s) always considered on pathway. For assistance finding a clinical trial, email CancerClinicalTrialsNavigation@va.gov.

[a] **Diagnosis** includes adequate imaging of primary tumor, core needle biopsy with **carefully planned needle track**; biopsy along future resection access with minimal dissection and attention to hemostasis

[b] **Chondrosarcoma** including low-grade extra-compartmental appendicular tumors, grade I axial tumors, grade II-III tumors, or clear cell or extra-compartmental tumors

[c] **Imaging** CT scan with contrast or MRI of affected area with and without contrast; CT chest at least every 6 months for 5 years and then annually for 10 years

Bone Sarcoma – Chondrosarcoma, Recurrent or Metastatic



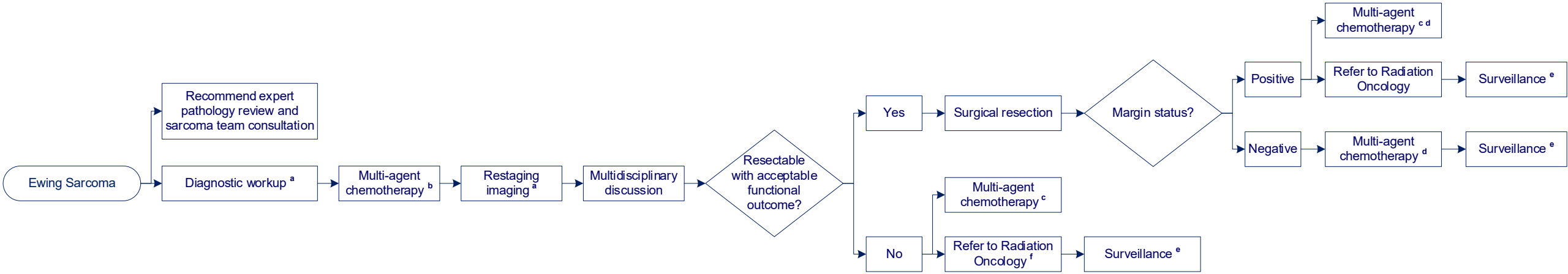
Clinical trial(s) always considered on pathway. For assistance finding a clinical trial, email CancerClinicalTrialsNavigation@va.gov.

[a] **Local Therapy** including surgery, radiation, or ablative therapies for symptomatic sites

[b] **Refer** if microsatellite instability is high tumor or tumor mutation burden is ≥10 mutations per megabase pembrolizumab may be used; if IDH1 mutations, use ivosidenib; all others, consider TKI therapy with dasatinib

[c] **Patients** with de-differentiated pathology follow Osteosarcoma pathway, if mesenchymal pathology follow Ewing Sarcoma pathway

Bone Sarcoma – Ewing Sarcoma



Clinical trial(s) always considered on pathway. For assistance finding a clinical trial, email CancerClinicalTrialsNavigation@va.gov.

[a] **Diagnostic** workup includes x-rays and contrast-enhanced MRI, CT chest with contrast, core needle biopsy with **carefully planned needle track**; biopsy along future resection access with minimal dissection and attention to hemostasis, cytogenetics and/or molecular studies; fertility consultation recommended

[b] **Multi-agent Chemotherapy** vincristine, doxorubicin, cyclophosphamide alternating with Ifosfamide/mesna and etoposide (VDC/IE) for a total course of 9 weeks (see Induction Chemotherapy Table)

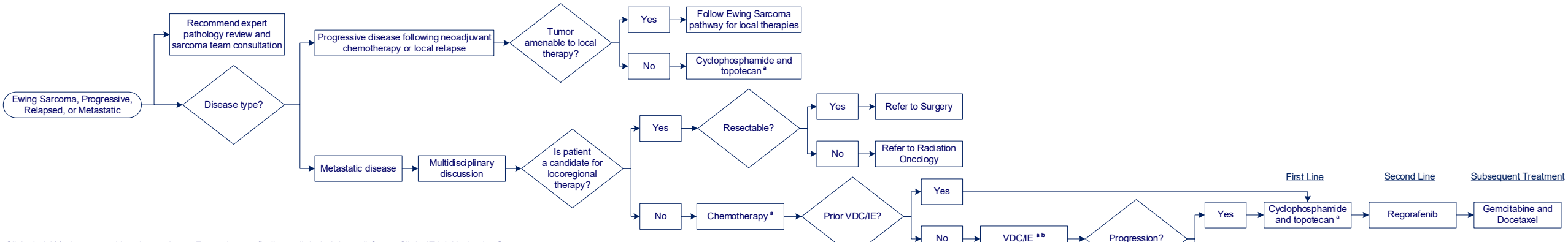
[c] **Concurrent Radiation** and chemotherapy should avoid the use of anthracycline chemotherapy due to excessive toxicity

[d] **Adjuvant** multi-agent chemotherapy with VDC/IE for a total course of 49 weeks as tolerated

[e] **Surveillance** includes physical exam including CBC, MRI or CT of primary site, and CT chest every 3 months

[f] **Definitive Radiation** with consideration of pre-operative and/or interoperative radiation if surgical resection is planned and/or positive margins are expected

Bone Sarcoma – Ewing Sarcoma, Progressive, Relapsed, or Metastatic



Clinical trial(s) always considered on pathway. For assistance finding a clinical trial, email CancerClinicalTrialsNavigation@va.gov.

[a] **Imaging** includes CT of chest, abdomen, pelvis, and primary site every 3 months to assess disease response

[b] **Multi-agent Chemotherapy** vincristine, doxorubicin, cyclophosphamide alternating with Ifosfamide/mesna and etoposide (VDC/IE) per patient tolerance; if unable to tolerate then VDC only

VDC/IE Vincristine, Doxorubicin, Cyclophosphamide alternating with Ifosfamide/Mesna and Etoposide

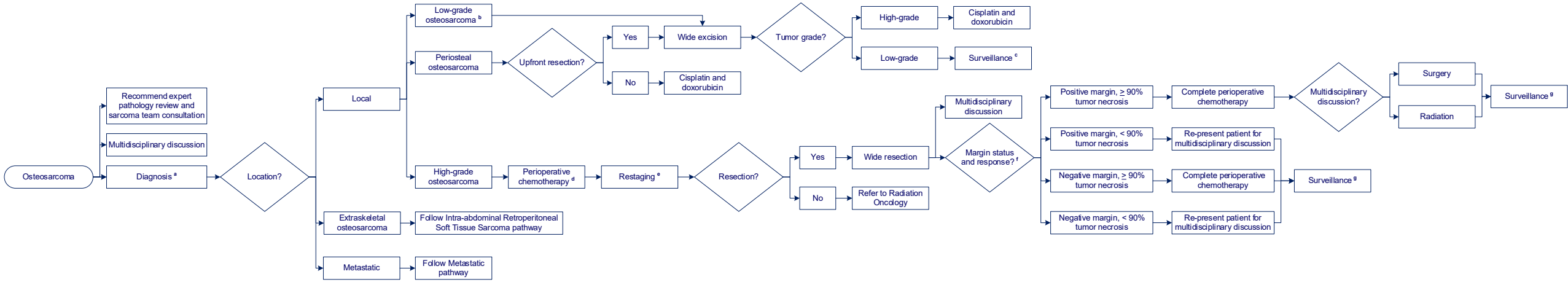
Bone Sarcoma – Induction Chemotherapy for Ewing Sarcoma

Induction Chemotherapy for Ewing Sarcoma			
Regimen	**Drug**	**Dose**	**Timing**
A	Vincristine	2 mg/m^2 (maximum 2 mg) IV over 1 minute, day 1	Weeks 1, 5, and 9
	Doxorubicin*	37.5 mg/m^2 IV over 1 to 15 minutes, days 1 and 2	
	Cyclophosphamide	1200 mg/m^2 IV over 30 to 60 minutes, day 1, with mesna	
	Filgrastim	5 mcg/kg per day (maximum 300 mcg) starting day 3	
B	Ifosfamide	1800 mg/m^2 IV over 1 hour, days 1 to 5, with mesna	Weeks 3, 7, and 11
	Etoposide	100 mg/m^2 IV over 1 to 2 hours, days 1 to 5	
	Filgrastim	5 mcg/kg per day (maximum 300 mcg) starting day 6	

* Doxorubicin is omitted during radiation therapy

Reference: Protocol supplement from: Womer RB, West DC, Krailo MD, et al. Randomized controlled trial of interval-compressed chemotherapy for the treatment of localized Ewing sarcoma: a report from the Children's Oncology Group. J Clin Oncol 2012; 30:4148

Bone Sarcoma – Osteosarcoma



Clinical trial(s) always considered on pathway. For assistance finding a clinical trial, email CancerClinicalTrialsNavigation@va.gov.

[a] **Diagnostic** workup includes x-rays and contrast-enhanced MRI, CT chest with contrast, core needle biopsy with **carefully planned needle track**; biopsy along future resection access with minimal dissection and attention to hemostasis, cytogenetics and/or molecular studies; fertility consultation recommended

[b] **Low-grade Osteosarcoma** includes parosteal osteosarcoma

[c] **Surveillance** includes CT or MRI of the primary site and CT chest with contrast

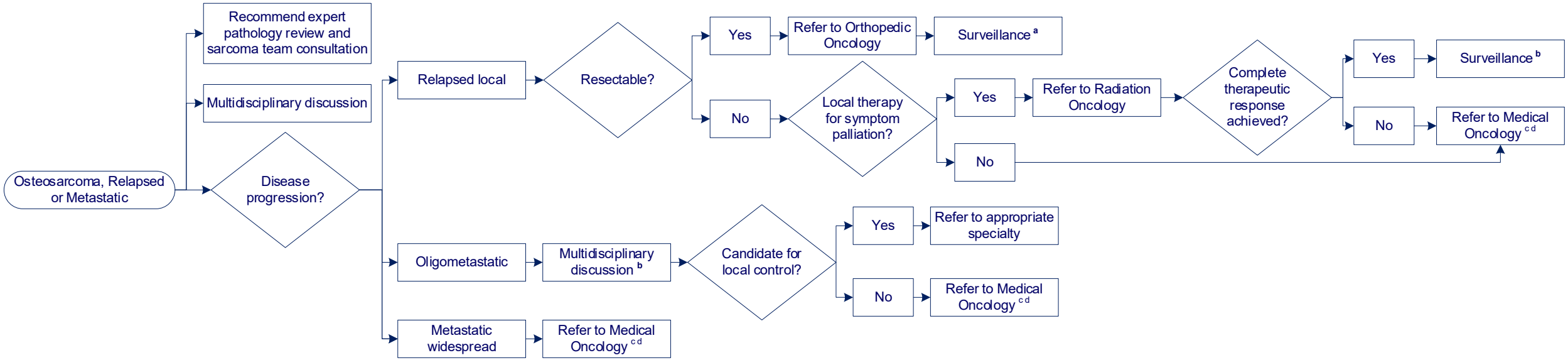
[d] **Neoadjuvant Chemotherapy** cisplatin and doxorubicin, +/- high dose methotrexate with leucovorin rescue based on patient fitness and tolerability

[e] **Restaging** MRI with contrast, x-rays of primary site, and CT chest with contrast

[f] **Good Response** ≥90% tumor necrosis, poor response <90% tumor necrosis

[g] **Surveillance** includes x-rays and contrast-enhanced MRI of the affected area and CT chest with contrast

Bone Sarcoma – Osteosarcoma, Relapsed or Metastatic



Clinical trial(s) always considered on pathway. For assistance finding a clinical trial, email CancerClinicalTrialsNavigation@va.gov.

[a] **Surveillance** includes x-rays and contrast-enhanced MRI of the effected area, and CT chest with contrast

[b] **Multidisciplinary Discussion** imaging review and determination of resection and locoregional therapy including radiation, ablation, and metastasectomy should be based on anatomic location and feasibility

[c] **Refer to Medical Oncology** for preferred **First Line therapy** doxorubicin and cisplatin +/- methotrexate with leucovorin rescue based on patient fitness and tolerability; if progression transition patient to **Second Line therapy** etoposide and Ifosfamide, **Subsequent therapy**, transition patient to regorafenib; recommend sending biopsy of metastatic lesion for tumor mutation burden

[d] **Patient Reassessment** includes contrast-enhanced MRI of the affected area, CT chest with contrast, and CT abdomen and pelvis

Bone Sarcoma – Molecular Testing Table

Eligibility	Test Category	Test Type	Recommended Vendors	NPOP Coverage	Specimen Type
Chondrosarcoma, widespread and asymptomatic	Somatic NGS	DNA and RNA based comprehensive genomic profiling (CGP)	Tempus Foundation F1CDx+F1RNA	Yes Yes	Tumor Tissue
Ewing Sarcoma, diagnostic workup*	FISH	FISH for *EWSR1::FLI1* fusion	Local VA or locally contracted vendor	No	Tumor Tissue
	Molecular	RT-PCR for *EWSR1::FLI1* fusion	Local VA or locally contracted vendor	No	Tumor Tissue
Small round blue cell tumor negative for *EWSR1::FLI1* fusion	Somatic NGS	DNA and RNA based comprehensive genomic profiling (CGP)	Tempus Foundation F1CDx+F1RNA	Yes Yes	Tumor Tissue
Osteosarcoma, metastatic**	Somatic NGS	DNA and RNA based comprehensive genomic profiling (CGP)	Tempus Foundation F1CDx+F1RNA	Yes Yes	Tumor Tissue
Bone sarcoma, not otherwise specified***	Somatic NGS	DNA and RNA based comprehensive genomic profiling (CGP)	Tempus Foundation F1CDx+F1RNA	Yes Yes	Tumor Tissue
*Small round blue cell tumor that is morphologically and phenotypically compatible with Ewing Sarcoma should have targeted testing using either FISH or molecular methodology (not both)					
**Biopsy should be collected from non-bony site (e.g. soft tissue, lymph node, or other organ, etc), and specimen should NOT be decalcified					
***Bone sarcoma that is non-chrondrosarcoma, non-osteosarcoma, and non-small round blue cell tumor. Consultation to soft tissue pathology specialist for diagnosis, and consultation to sarcoma specialist for therapeutic management					