

Testicular Cancer Treatment Regimens

Clinical Trials: The NCCN recommends cancer patient participation in clinical trials as the gold standard for treatment.

Cancer therapy selection, dosing, administration, and the management of related adverse events can be a complex process that should be handled by an experienced healthcare team. Clinicians must choose and verify treatment options based on the individual patient; drug dose modifications and supportive care interventions should be administered accordingly. The cancer treatment regimens below may include both U.S. Food and Drug Administration-approved and unapproved indications/regimens. These regimens are only provided to supplement the latest treatment strategies.

These Guidelines are a work in progress that may be refined as often as new significant data becomes available. The National Comprehensive Cancer Network Guidelines[®] are a consensus statement of its authors regarding their views of currently accepted approaches to treatment. Any clinician seeking to apply or consult any NCCN Guidelines[®] is expected to use independent medical judgment in the context of individual clinical circumstances to determine any patient's care or treatment. The NCCN makes no warranties of any kind whatsoever regarding their content, use, or application and disclaims any responsibility for their application or use in any way.

Note: All recommendations are category 2A unless otherwise indicated.

► Primary Chemotherapy for Germ Cell Tumors¹

REGIMEN	DOSING
Preferred Regimens	
BEP (Bleomycin + Etoposide + Cisplatin) ^{2,a,b}	Days 1-5: Cisplatin 20mg/m ² IV over 60 minutes daily ^a Days 1-5: Etoposide 100mg/m ² IV over 60 minutes daily Days 1,8,15 OR Days 2,9,16: Bleomycin 30 units IV over 10 minutes daily. Repeat cycle every 3 weeks for 3-4 cycles ^b (seminoma) or 1, 3, or 4 cycles ^b (nonseminoma).
EP (Cisplatin + Etoposide) ^{3,a,c}	Days 1-5: Cisplatin 20mg/m ² IV over 60 minutes daily ^a Days 1-5: Etoposide 100mg/m ² IV over 60 minutes daily. Repeat cycle every 3 weeks for 4 cycles. ^c
Other Recommended Regimens	
Carboplatin (for patients with stage IA, IB seminoma) ^{4,6}	Day 1: Carboplatin AUC 7 over 30 minutes. Repeat cycle every 3 weeks for 1-2 cycles.
VIP (Etoposide + Ifosfamide + Mesna + Cisplatin; for intermediate risk patients with stage IIC, III seminoma or intermediate risk patients with stage IIIB nonseminoma or selected patients with poor-risk, stage IIIC nonseminoma) ^{7,a,d,f}	Days 1-5: Etoposide 75mg/m ² IV over 60 minutes daily Days 1-5: Mesna 240mg/m ² IV over 15 minutes before Ifosfamide, then at 4 and 8 hours from start of each Ifosfamide dose ^e Days 1-5: Cisplatin 20mg/m ² IV over 60 minutes daily. ^a Repeat cycle every 3 weeks for 4 cycles.

► Adjuvant Chemotherapy Following Resection of Residual Germ Cell Tumors^{1,g,h}

EP (Cisplatin + Etoposide) ^{3,a,h}	Days 1-5: Cisplatin 20mg/m ² IV over 60 minutes daily ^a Days 1-5: Etoposide 100mg/m ² over 60 minutes. Repeat every 3 weeks for 2 cycles.
TIP (Paclitaxel + Ifosfamide + Cisplatin) ^{8,a,e,i}	Day 1: Paclitaxel 250mg/m ² IV continuous infusion over 24 hours Days 2-5: Mesna 300mg/m ² IV over 15 minutes before Ifosfamide, then at 4 and 8 hours from the start of each Ifosfamide dose ^e Days 2-5: Ifosfamide 1,500mg/m ² IV over 3 hours daily ^d Days 2-5: Cisplatin 25mg/m ² IV over 60 minutes daily. ^a Repeat cycle every 3 weeks for 2 cycles.
VIP (Etoposide + Ifosfamide + Mesna + Cisplatin) ^{7,a,d,e}	Days 1-5: Etoposide 75mg/m ² IV over 60 minutes daily Days 1-5: Mesna 240mg/m ² IV over 15 minutes before Ifosfamide, then at 4 and 8 hours from start of each Ifosfamide dose daily Days 1-5: Ifosfamide 1,200mg/m ² IV over 3 hours daily ^e Days 1-5: Cisplatin 20mg/m ² IV over 60 minutes daily. ^a Repeat cycle every 3 weeks for 2 cycles.
VeIP (Etoposide + Ifosfamide + Cisplatin) ^{9,10,a,e,i}	Days 1-2: Vinblastine 0.11mg/kg IV over 5-10 minutes daily Days 1-5: Mesna 240mg/m ² IV over 15 minutes before Ifosfamide, then at 4 and 8 hours from the start of each Ifosfamide dose daily ^e Days 1-5: Ifosfamide 1,200mg/m ² IV over 3 hours daily Days 1-5: Cisplatin 20mg/m ² IV over 60 minutes daily. Repeat cycle every 3 weeks for 2 cycles.

continued

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► Post-Surgical Chemotherapy Following Retroperitoneal Lymph Node Dissection for Nonseminoma Tumors¹

REGIMEN	DOSING
BEP (Bleomycin + Etoposide + Cisplatin) ^{2,a,i}	Days 1-5: Cisplatin 20mg/m ² IV over 60 minutes daily ^a Days 1-5: Etoposide 100mg/m ² IV over 60 minutes daily Days 1,8,15 OR Days 2,9,16: Bleomycin 30 units IV over 10 minutes daily. Repeat cycle every 3 weeks for 2 or 3 cycles. ^l
EP (Cisplatin + Etoposide) ^{3,a,g,j}	Days 1-5: Cisplatin 20mg/m ² IV over 60 minutes daily ^a Days 1-5: Etoposide 100mg/m ² IV over 60 minutes daily. Repeat cycle every 3 weeks for 2 or 4 cycles. ^l

► Second-Line Chemotherapy Regimens for Metastatic Germ Cell Tumors^{1,k}

Conventional-Dose Chemotherapy Regimens	
Preferred Regimens	
TIP (Paclitaxel + Ifosfamide + Cisplatin) ^{8,e,i,k}	Day 1: Paclitaxel 250mg/m ² IV continuous infusion over 24 hours Days 2-5: Mesna 300mg/m ² IV over 15 minutes before Ifosfamide, then at 4 and 8 hours from the start of each Ifosfamide dose Days 2-5: Ifosfamide 1,500mg/m ² IV over 3 hours daily ^e Days 2-5: Cisplatin 25mg/m ² IV over 60 minutes daily. Repeat cycle every 3 weeks for 4 cycles.
VeIP (Etoposide + Ifosfamide + Cisplatin) ^{9,10,a,e,i,k}	Days 1-2: Vinblastine 0.11mg/kg IV over 5-10 minutes daily Days 1-5: Mesna 240mg/m ² IV over 15 minutes before Ifosfamide, then at 4 and 8 hours from the start of each Ifosfamide dose daily ^e Days 1-5: Ifosfamide 1,200mg/m ² IV over 3 hours daily Days 1-5: Cisplatin 20mg/m ² IV over 60 minutes daily. Repeat cycle every 3 weeks for 4 cycles.
High-Dose Chemotherapy Regimens	
Preferred Regimens	
Carboplatin + Etoposide ¹¹	Carboplatin 700mg/m ² IV Etoposide 750mg/m ² IV. Administer 5, 4 and 3 days before peripheral blood stem cell infusion for 2 cycles.
Paclitaxel + Ifosfamide + Carboplatin + Etoposide ^{12-14,e}	Day 1: Paclitaxel 200mg/m ² IV over 24 hours Days 2-4: Ifosfamide 2000mg/m ² IV over 4 hours with Mesna protection. ^e Repeat every 2 weeks for 2 cycles, followed by: Days 1-3: Carboplatin AUC 7-8 IV over 60 minutes Days 1-3: Etoposide 400mg/m ² IV. Administer with peripheral blood stem cell support at 14- to 21-day intervals for 3 cycles.

► Third-Line Chemotherapy Regimens for Metastatic Germ Cell Tumors: High-Dose Chemotherapy NOT Previously Received^{1,k}

Preferred Regimens (High-Dose Chemotherapy)	
Carboplatin + Etoposide ¹¹	Carboplatin 700mg/m ² IV Etoposide 750mg/m ² IV. Administer 5, 4 and 3 days before peripheral blood stem cell infusion for 2 cycles.
Paclitaxel + Ifosfamide + Carboplatin + Etoposide ^{12-14,e}	Day 1: Paclitaxel 200mg/m ² IV over 24 hours Days 2-4: Ifosfamide 2000mg/m ² IV over 4 hours with Mesna protection. ^e Repeat every 2 weeks for 2 cycles, followed by: Days 1-3: Carboplatin AUC 7-8 IV over 60 minutes Days 1-3: Etoposide 400mg/m ² IV. Administer with peripheral blood stem cell support at 14- to 21-day intervals for 3 cycles.

continued

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► Third-Line Chemotherapy Regimens for Metastatic Germ Cell Tumors: High-Dose Chemotherapy NOT Previously Received^{1,k} (continued)

REGIMEN	DOSING
Other Recommended Regimens	
Gemcitabine + Paclitaxel + Oxaliplatin ¹⁵	Days 1,8: Paclitaxel 80mg/m ² IV over 60 minutes Days 1,8: Gemcitabine 800mg/m ² IV over 30 minutes Day 1: Oxaliplatin 130mg/m ² IV over 2 hours. Repeat cycle every 3 weeks for 8 cycles.
Gemcitabine + Oxaliplatin ¹⁶⁻¹⁸	Days 1,8: Gemcitabine 1000-1.250mg/m ² IV over 30 minutes Day 1: Oxaliplatin 130mg/m ² IV over 2 hours. Repeat cycle every 3 weeks.
Gemcitabine + Paclitaxel ^{19,20}	Days 1,8,15: Paclitaxel 100mg/m ² IV over 60 minutes Days 1,8,15: Gemcitabine 1,000mg/m ² IV over 30 minutes. Repeat every 4 weeks for 6 cycles.
Etoposide (oral) ²¹	Days 1-21: Etoposide 50-100 mg orally daily. Repeat cycle every 4 weeks.
Useful in Certain Circumstances	
Pembrolizumab (for MSI-H/dMMR tumors) ²²⁻²⁴	Day 1: Pembrolizumab 200mg IV over 30 minutes. Repeat cycle every 3 weeks.

► Third-Line Chemotherapy Regimens for Metastatic Germ Cell Tumors: High-Dose Chemotherapy Previously Received^{1,k}

Preferred Regimens	
Gemcitabine + Paclitaxel + Oxaliplatin ¹⁵	Days 1,8: Paclitaxel 80mg/m ² IV over 60 minutes Days 1,8: Gemcitabine 800mg/m ² IV over 30 minutes Day 1: Oxaliplatin 130mg/m ² IV over 2 hours. Repeat cycle every 3 weeks for 8 cycles.
Gemcitabine + Oxaliplatin ¹⁶⁻¹⁸	Days 1,8: Gemcitabine 1000-1.250mg/m ² IV over 30 minutes Day 1: Oxaliplatin 130mg/m ² IV over 2 hours. Repeat cycle every 3 weeks.
Gemcitabine + Paclitaxel ^{19,20}	Days 1,8,15: Paclitaxel 100mg/m ² IV over 60 minutes Days 1,8,15: Gemcitabine 1,000mg/m ² IV over 30 minutes. Repeat every 4 weeks for 6 cycles.
Etoposide (oral) ²¹	Days 1-21: Etoposide 50-100 mg orally daily. Repeat cycle every 4 weeks.
Useful in Certain Circumstances	
Pembrolizumab (for MSI-H/dMMR tumors) ²²⁻²⁴	Day 1: Pembrolizumab 200mg IV over 30 minutes. Repeat cycle every 3 weeks.

^a Hydration is required with supplemental electrolytes pre- and post-administration of Cisplatin.

^b For stage IIA, IIB, IIC, or III (seminoma) with Category 1 designation for stage IIC, III good or intermediate risk disease; or stage I-IIIC (nonseminoma) with Category 1 designation for IS, IIA (S1), IIB (S1), IIC, IIIA, IIIB, IIIC disease. Number of cycles dependent on stage of disease.

^c For stage II-III (seminoma) with Category 1 designation for stage IIC, III good-risk disease; or stage IS, IIA (S1), IIB (S1), IIC, IIIA (nonseminoma) with Category 1 designation.

^d VIP: This regimen is high risk for febrile neutropenia and granulocyte colony-stimulating factors (G-CSFs) should be used (See NCCN Guidelines for Hematopoietic Growth Factors).

^e Hydration is required pre- and post-administration of Ifosfamide.

^f Category 1 for intermediate-risk stage IIIB disease and poor-risk stage IIIC disease (nonseminoma).

^g In the case of seminoma, adjuvant chemotherapy should be considered following complete resection of all residual disease. If resection incomplete, full course of second-line chemotherapy is recommended. If a biopsy is performed and is positive, consider surgery if complete resection is possible, or full course of second-line chemotherapy.

^h Consider EP for low-volume, residual embryonal, yolk sac, choriocarcinoma, or seminoma element (nonseminoma).

ⁱ TIP, VeIP: These regimens are high risk for febrile neutropenia and G-CSFs should be used (See NCCN Guidelines for Hematopoietic Growth Factors).

^j Number of cycles is dependent on nodal status.

^k If VeIP or TIP received as second-line therapy, high-dose chemotherapy is the preferred third-line option.

continued

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References

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