

MD Anderson Peripheral T-cell Lymphomas (PTCL)¹

Page 1 of 10

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TABLE OF CONTENTS

Pathologic Diagnosis/Initial Evaluation	Page 2
Peripheral T-Cell Lymphoma Stage I-IV	Pages 3-4
Peripheral T-Cell Lymphoma Refractory or Relapse	Pages 5-6
APPENDIX A: Prognostic Index for PTCL - Unspecified (PIT)	Page 7
Suggested Readings	Pages 8-9
Development Credits	Page 10

¹ This algorithm contains the following subtypes: PTCL - not otherwise specified (NOS), angioimmunoblastic T-cell lymphoma (AITL), anaplastic large cell lymphoma (ALCL), anaplastic lymphoma kinase (ALK) positive and ALK negative, enteropathy associated T-cell lymphoma (EATL), monomorphic epitheliotropic intestinal T-cell lymphoma (MEITL), hepatosplenic gamma-delta T-cell lymphoma (HSGDTL), primary cutaneous gamma-delta T-cell lymphoma (PCGDTL), extranodal natural killer T-cell lymphoma (ENKTCL), and adult T-cell leukemia//lymphoma (ATLL).

The following subtypes are **not** included in this algorithm: T-cell prolymphocytic leukemia (T-PLL), T-cell large granular lymphocytic leukemia (T-LGL), primary cutaneous ALCL, breast implant-associated (BIA)-ALCL and all other cutaneous T-cell lymphoma (See Cutaneous T-cell Lymphoma (CTCL) algorithm).

Page 2 of 10

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size of liver and spleen

Performance status

involvement is present or suspected

body weight ≤ 6 months of diagnosis)

ESSENTIAL:

Note: Consider Clinical Trials as treatment options for eligible patients.

PATHOLÓGIC DÍAGNOSIS

ESSENTIAL:

- Hematopathology review of all slides with at least one paraffin block or 15 unstained slides representative of the tumor. Re-biopsy if consult material is nondiagnostic.
- Adequate morphology and immunophenotyping to establish diagnosis
- o Flow cytometry immunophenotypic studies: CD2, CD3, CD4, CD5, CD7, CD8, CD10, CD16, CD25, CD26, CD14, CD45, CD52, CD56, CD57, CD94, TCRbeta, TCRgamma, CD30, and TRCB1
- o Paraffin Panel: CD20, CD4, CD8, CD3, CD30 and/or other pan-T-cell markers (CD2, CD5, CD7, CD43), Ki-67, EBER-ISH

OF USE IN CERTAIN CIRCUMSTANCES TO DETERMINE SUBGROUP:

- TBX21/CXCR3/GATA3 and CCR4 to assess PTCL-TBX21 and PTCL-GATA3 plus ICOS and PD1 to exclude lymphomas with follicular helper phenotype (in cases of PTCL- NOS)
- BetaF1, CD25, CD30 [(mycosis fungoides (MF)/Sezary syndrome (SS) large cell transformation (LCT)]
- TCR delta, CD94 (HSGDTL, PCGDTL, SPTCL, and MEITL)
- CD10, BCL-6, PD1, CXCL13, CD21, ICOS, and IDH2 R172K (AITL/TfH)
- CD15, ALK1, EMA (anaplastic cell lymphoma)
- CD103, CD56 (EATL)
- CD56 with or without CD3 (ENKTCL)
- CD1a, CD34, TdT (T lymphoblastic lymphoma)
- TCL-1, FOXP3, CD25 (T-cell prolymphocytic leukemia and adult T-cell leukemia/lymphoma)
- FISH studies to detect DUSP22 and TP63 (ALK negative ALCL)
- Molecular studies to detect clonality of the TCR genes
- NGS studies (end lymphoma panel) to assess the mutational landscape

STRONGLY RECOMMENDED:

SPTCL = subcutaneous panniculitis-like T-cell lymphoma

• Fine needle aspiration (FNA) or core biopsy for tissue array/banking by protocol

TfH = T follicular helper

• CBC with differential, BUN, creatinine, albumin, AST, bilirubin, serum calcium,

INITIAL EVALUATION

• Physical exam: attention to node-bearing areas, including Waldeyer's ring, and to

o Consider Dermatology consult for comprehensive skin assessment if cutaneous

o B symptoms (Unexplained fever > 38°C during the previous month; Recurrent

drenching night sweats during the previous month; Weight loss > 10 percent of

• Calculation of Prognostic Index for PTCL-Unspecified (PIT)¹ (See Appendix A)

alkaline phosphatase, uric acid, LDH • Beta-2-microglobulin

• Screening for HIV 1 and 2, hepatitis B and C (HBcAb, HBaAg, HCVAb)

• HTLV 1/2 serology

• If HSGDTL, ENKTCL or PCGDTL or if fever > 38°C, pancytopenia, and transaminitis in the appropriate clinical setting, conduct an HLH work up including EBV by PCR, ferritin, fibrinogen, triglycerides, CRP, natural killer (NK) subset panel, T-NK flow cytometry and cytokine panel which includes IL-2sR (sCD25)

• Unilateral or bilateral bone marrow biopsy with aspirate

• PET/CT

• Lifestyle risk assessment²

• MUGA scan or echocardiogram

OF USE IN SELECTED CASES:

• CT head or MRI with contrast

• EBV with PCR (AITL/TfH, ENKTCL)

• Pregnancy test

- Lumbar puncture, if paranasal sinus, testicular, parameningeal, orbit, CNS, paravertebral, bone marrow or HIV lymphoma
- Serum immunoelectrophoresis (SPEP)
- If suspected EATL, work up for celiac disease
- Discuss fertility options and sperm banking for patients of child bearing potential (refer to Fertility Preservation Prior to Cancer Treatment algorithm)

See Page 3: Induction

therapy

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Not used to determine the choice of treatment

² See Physical Activity, Nutrition, Obesity Screening and Management, and Tobacco Cessation Treatment algorithms; ongoing reassessment of lifestyle

Page 3 of 10

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Note: Consider Clinical Trials as treatment options for eligible patients. **INTERIM RESPONSE FOLLOW-UP** INDUCTION THERAPY • ALCL • BV-CHP with or without ISRT • Other options: CHOEP or CHOP with or without ISRT¹ • Consider abbreviated chemotherapy with ISRT¹ for limited stage ALK positive or ALK negative DUSP22 positive • PTCL-NOS, nodal PTCL, and AITL • BV-CHP (preferred for CD30-positive) or • Complete current treatment Complete or partial o CHOEP or → • See Page 4 for evaluation, response^{4,5} o CHOP or response, treatment and follow-up After 2-4 cycles, Stages I - IV o Dose-adjusted EPOCH repeat all positive • HSGDTL, PCGDTL, EATL and MEITL studies³ • HCVAD or See Page 5 for refractory or No response or Dose adjusted EPOCH relapse therapy progressive disease^{4,5} • ENKTCL ALK = anaplastic lymphoma kinase ∘ Stage I/II: DeVIC with ISRT¹ BV-CHP = brentuximab vedotin, cyclophosphamide, doxorubicin, prednisone, o Stage III/IV: SMILE or DDGP or P-GEMOX CHOP = cyclophosphamide, doxorubicin, vincristine, prednisone • ATLL² CHOEP = cyclophosphamide, doxorubicin, vincristine, etoposide, prednisone o BV-CHP (preferred for CD30-positive) or DDGP = cisplatin, dexamethasone, gemcitabine, pegaspargase DeVIC = dexamethasone, etoposide, ifosfamide, carboplatin o Dose adjusted EPOCH or EPOCH = etoposide, prednisone, vincristine, cyclophosphamide, doxorubicin • CHOEP or HCVAD = hyperfractionated cyclophosphamide, vincristine, doxorubicin, and dexamethasone o HCVAD ISRT = involved site radiation therapy • CTCL and large cell transformation: Refer to Cutaneous T-cell P-GEMOX = pegaspargase, gemcitabine, oxaliplatin Lymphoma (CTCL) algorithm SMILE = steroid, methotrexate, ifosfamide, L-asparaginase, etoposide

¹ For limited stage patients, radiation therapy can be considered as consolidation after a complete metabolic response to systemic therapy, particularly if abbreviated systemic therapy (3-4 cycles). For all patients, radiation therapy can be considered to sites of bulky disease or for an incomplete response after systemic therapy. ISRT and advanced RT techniques should be used. Doses vary based on clinical scenarios (e.g., consolidation, salvage, palliation) and can range from 20-50Gy.

² For chronic ATLL or smoldering, consider anti-retroviral [zidovudine (ZDV), azidothymidine (AZT), bictegravir/emtricitabine/tenofovir alafenamide (Biktarvy[®])] and interferon alfa (IFN alpha) or mogamulizumab, skin directed therapy (if applicable) or radiotherapy

³ PET scans should be used to assess residual abnormalities on CT scan, especially if done pretreatment

⁴ Partial response includes a biological measure of disease: fluorodeoxyglucose (FDG)-avid disease with reduced uptake compared to baseline PET/CT scan. A positive PET/CT at the end of treatment proved to be lymphoma on biopsy is considered to be residual/refractory disease.

⁵ For response assessment, refer to: Cheson, B. D., Fisher, R. I., Barrington, S. F., Cavalli, F., Schwartz, L. H., Zucca, E., & Lister, T. A. (2014). Recommendations for initial evaluation, staging, and response assessment of Hodgkin and non-Hodgkin lymphoma: The Lugano classification. Journal of Clinical Oncology, 32(27), 3059-3067. doi: 10.1200/JCO.2013.54.8800 Department of Clinical Effectiveness V6



Page 4 of 10

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Note: Consider Clinical Trials as treatment options for eligible patients.

RESPONSE TREATMENT AND FOLLOW-UP END OF TREATMENT EVALUATION • Consider autologous stem cell transplant as clinically indicated • Consider allogeneic stem cell transplant for young/fit patients with aggressive disease (e.g., ATLL, all gamma-delta phenotypes (HSGDTL, PCGDTL), MEITL, MF-LCT) Complete response • Consider clinical trial • Follow-up every 3 to 6 months for 2 years with CT or PET-CT every 6 months as clinically indicated. After 5 years, refer to Survivorship – Peripheral T-Cell Lymphoma algorithm • At completion of treatment, repeat all positive studies • PET-CT should be used to assess residual abnormalities on CT scan, especially if done pretreatment Partial response^{1,2} • If residual disease, consider biopsy See Page 5 for refractory or relapse therapy No response or progressive disease¹

¹ For response assessment, refer to: Cheson, B. D., Fisher, R. I., Barrington, S. F., Cavalli, F., Schwartz, L. H., Zucca, E., & Lister, T. A. (2014). Recommendations for initial evaluation, staging, and response assessment of Hodgkin and non-Hodgkin lymphoma: The Lugano classification. *Journal of Clinical Oncology*, 32(27), 3059-3067. doi: 10.1200/JCO.2013.54.8800

² Partial response includes a biological measure of disease: fluorodeoxyglucose (FDG)-avid disease with reduced uptake compared to baseline PET/CT scan. A positive PET/CT at the end of treatment proved to be lymphoma on biopsy is considered to be residual/refractory disease.

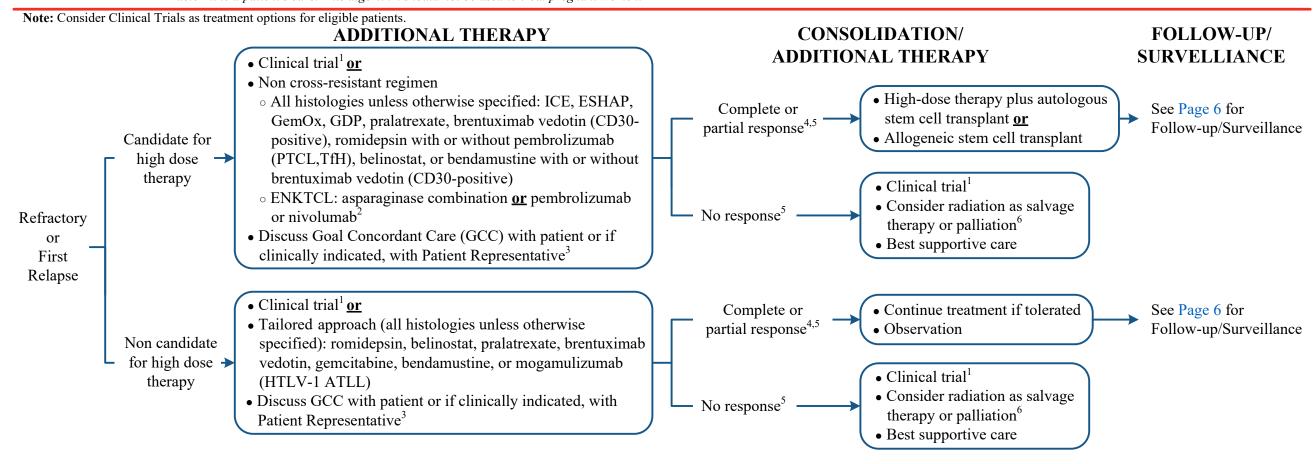
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MD Anderson Peripheral T-cell Lymphomas (PTCL)

Page 5 of 10

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ICE = ifosfamide, carboplatin, etoposide GemOx = gemcitabine and oxaliplatin

ESHAP = etoposide, methylprednisolone, high dose cytarabine, cisplatin GDP = gemcitabine, dexamethasone, and cisplatin

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¹ Clinical trials or individual regimens: patients who progress after three successive regimens are unlikely to derive additional benefit from currently utilized combination chemotherapy regimens, except for patients with a long disease-free interval

² The use of checkpoint inhibitors prior to allogeneic stem cell transplant may result in increased transplantation-related mortality and severe hyperacute graft versus host disease (GVHD)

³ GCC should be initiated by the Primary Oncologist. If Primary Oncologist is unavailable, Primary Team/Attending Physician to initiate GCC discussion and notify Primary Oncologist. Patients or if clinically indicated, the Patient Representative should be informed of therapeutic and/or palliative options. GCC discussion should be consistent, timely, and re-evaluated as clinically indicated. The Advance Care Planning (ACP) note should be used to document GCC discussion. Refer to GCC home page (for internal use only).

⁴ Partial response includes a biological measure of disease: fluorodeoxyglucose (FDG)-avid disease with reduced uptake compared to baseline PET/CT scan. A positive PET/CT at the end of treatment proved to be lymphoma on biopsy is considered to be residual/refractory disease.

⁵ For response assessment, refer to: Cheson, B. D., Fisher, R. I., Barrington, S. F., Cavalli, F., Schwartz, L. H., Zucca, E., & Lister, T. A. (2014). Recommendations for initial evaluation, staging, and response assessment of Hodgkin and non-Hodgkin lymphoma: The Lugano classification. Journal of Clinical Oncology, 32(27), 3059-3067. doi:10.1200/JCO.2013.54.8

⁶ For limited stage patients, radiation therapy can be considered as consolidation after a complete metabolic response, particularly if abbreviated systemic therapy (3-4 cycles). For all patients, radiation therapy can be considered to sites of bulky disease or for an incomplete response after systemic therapy. ISRT and advanced RT techniques should be used. Doses vary based on clinical scenarios (e.g., consolidation, salvage, palliation) and can range from 20-50Gy.



Page 6 of 10

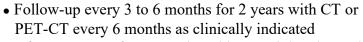
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FOLLOW-UP/SURVELLIANCE

RELAPSE #2 OR GREATER



• After 5 years, refer to Survivorship – Peripheral T-Cell Lymphoma algorithm

If disease progression

- Clinical trial¹ or
- Other individual approach (e.g., romidepsin with or without pembrolizumab, belinostat, pralatrexate, brentuximab vedotin (CD30 positive PTCL), gemcitabine, bendamustine)
- Consider lenalidomide or duvelisib or azacytidine or ruxolitinib (if JAK/STAT mutations and/or pSTAT3 expression)

¹ Clinical trials or individual regimens: patients who progress after three successive regimens are unlikely to derive additional benefit from currently utilized combination chemotherapy regimens, except for patients with a long disease-free interval



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Page 7 of 10

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APPENDIX A: Prognostic Index for PTCL - Unspecified (PIT)¹

Risk Factors	Prognostic Risk	Number of Risk Factors
Age > 60 yearsLDH > 1 times normal	• Group 1 • Group 2	0 1
 Performance status 2 – 4 Bone marrow involvement 	 Group 3 Group 4	2 3 or 4

¹ Other prognostic scoring systems have been proposed and validated, but none are currently used to impact PTCL treatment



Page 8 of 10

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Page 9 of 10

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Page 10 of 10

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DEVELOPMENT CREDITS

This practice algorithm is based on majority expert opinion of the Lymphoma Center providers at the University of Texas MD Anderson Cancer Center. It was developed using a multidisciplinary approach that included input from the following:

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