



# Provincial Hodgkin's Lymphoma Treatment Guidelines

*Clinical practice guidelines have been developed after multi-disciplinary consensus based on best available literature. As the name suggests, these are to be used as a guide only. These guidelines do not replace physician judgment which is based on multiple factors including, but not limited to, the clinical and social scenario, comorbidities, performance status, age, available resources and funding considerations. The Saskatchewan Cancer Agency disclaims all liability for the use of guidelines except as expressly permitted by the Agency. No portion of these guidelines may be copied, displayed for redistribution to third parties for commercial purposes or any non-permitted use without the prior written permission from the Agency.*

*Benefits and risk of the proposed should be discussed with patient.*

*Participating in clinical trials is encouraged when available. Involvement of a multidisciplinary team is strongly recommended.*

## **Diagnosis and Work-up:**

- Diagnosis by core or excisional (preferred) biopsy.
- History and physical exam
- CBC, metabolic profile, albumin, LDH, ESR
- Bone marrow biopsy (in stage IB, IIB, III and IV)
- Pregnancy test in childbearing woman
- Consider screening for Hepatitis B, Hepatitis C and HIV
- TSH if radiation is planned
- Chest X-ray PA and lateral (in selected cases)
- CT chest/abdomen/pelvis
- CT neck (as clinically indicated)
- PET/CT (in selected cases)
- Cardiac wall motion study (MUGA) or Echo-2D
- Pulmonary function test

## **Staging**

Stage I - Involvement of a single lymph node region

Stage II - Involvement of two or more lymph node regions or lymph node structures on the same side of the diaphragm.

Stage III - Involvement of lymph node regions or lymphoid structures on both sides of the diaphragm.

Stage IV - Diffuse or disseminated involvement of one or more extra nodal organs or tissue beyond that designated E, with or without associated lymph node.

All cases are sub classified into:

(A) Absence

Or

(B) Fever or night sweats or weight loss > 10 percent during the six months

Other Designations

"E" - Extra nodal contiguous extension.

"X" - Bulky disease (mediastinal mass with a maximum width that is equal to or greater than one-third of the internal transverse diameter of the thorax at the level of T5/6 interspace or >10 cm maximum dimension of a nodal mass)

### **International Prognostic Score for Hodgkin Lymphoma (stage III and IV)**

- Serum albumin <40 g/L
- Hemoglobin <105 g/L
- Male gender
- Stage IV disease
- Age >45 years
- White blood cell count  $\geq 15,000/\text{mm}^3$
- Lymphocyte count  $< 600/\text{mm}^3$  or  $< 8\%$  of white cell count

Score ranges from 0 to 7.

Median survival at the end of 5 years ranges from 89% (0 score) to 56% (5 or more score).

### **Treatment of Classical Hodgkin's Lymphoma: Stage IA/B, IIA and selected IIB**

Assess prognostic features as per German Hodgkin's Study Group (GHSG)

- Three or more sites of disease
- Extra nodal extension
- Bulky disease
- ESR more than 50 mm/hr  
(more than 30 if B symptoms present)

Presence of any one adverse prognostic feature is considered as unfavorable prognosis.

Favorable prognosis

- Administer two cycles of Doxorubicin, Bleomycin, Vinblastine, Dacarbazine (ABVD) followed by 20 Gy involved field radiation therapy.

Unfavorable prognosis

- Administer four cycles of Doxorubicin, Bleomycin, Vinblastine, Dacarbazine (ABVD) followed by 30 Gy involved field radiation therapy.
- In bulky disease consider 30 to 36 Gy involved field radiation therapy

### **Treatment of Classical Hodgkin's Lymphoma: Stage IIB (extra nodal extension and bulky disease), IIIA/B and IVA/B**

- Administer six to eight cycles of Doxorubicin, Bleomycin, Vinblastine, Dacarbazine (ABVD)
- In bulky disease consider involved field radiation therapy (30 to 36 Gy)

### **Treatment of Lymphocyte Predominant Hodgkin's Lymphoma**

- In stage IA disease: 30 to 36 Gy involved field radiation therapy alone
- Treatment similar to classical Hodgkin's lymphoma

Note: Can consider Rituximab with or without Doxorubicin, Bleomycin, Vinblastine, Dacarbazine (ABVD) or Cyclophosphamide, Doxorubicin, Vincristine, Prednisone (CHOP) or Cyclophosphamide, Vincristine, Prednisone (CVP) or observation in selected cases

### **Evaluate for treatment response**

#### Interim

- None in non-bulky stage IA/B, IIA and selected IIB with favorable or unfavorable features
- After two to four cycles of chemotherapy, assess with CT for response in IIB (extra nodal extension and bulky disease) III and IV disease

#### After completion of treatment

- PET/CT (preferred) after 4 weeks of chemotherapy or 9 to 12 weeks of radiation therapy.
- Bone marrow biopsy if initially positive

### **Residual or Refractory or Recurrent Disease and Stem Cell Transplant guidelines in Relapsed Hodgkin's Lymphoma**

- Salvage radiation therapy if relapse is limited and can be dealt with by radiation therapy
- If more than limited or early relapse:
  - Salvage chemotherapy if patient eligible to undergo autologous stem cell transplant (ASCT).
  - Gemcitabine, Dexamethasone, Cisplatin (GDP) or similar salvage protocol, 2 to 4 cycles will be used
  - Reassessment by CT-scan post 2<sup>nd</sup> cycle
- Proceed to ASCT if Complete Response (CR) or Partial Response (PR)
  - BEAM conditioning
- If not in CR/PR : 1-2 more cycles then ASCT regardless of response

- PET-CT evaluation 6-8 weeks post ASCT
- Consider radiation therapy for single PET positive lesion post ASCT
- Consider reduced intensity allogenic stem cell transplant (RIC-AlloSCT) if patient  $\leq$  50 years old and
  - High risk, defined as:
    - PET positivity post ASCT and/or
    - Two risk factors of:
      - Relapse in less than 12 months from initial CT (should be one of them)
      - Stage III/IV at relapse
      - Relapse in previously irradiated site
- Brentuximab or inclusion in clinical trial will be considered for relapse post allogenic stem cell transplant or after autologous stem cell transplant if the patient is not eligible for another auto stem cell transplant or allogenic transplant
- Second ASCT may be considered in relapsed patients who were in remission more than five years post the first ASCT
- Patients with relapse not eligible for transplant can be treated with palliative salvage chemotherapy regimens

### **Follow-up Guidelines**

- History and physical exam every 3 months for first 2 years, every 6 months for the next 3 years and then annually
- Annual influenza vaccine
- Labs: CBC, Metabolic panel, LDH, annual TSH if RT administered to neck
- Surveillance imaging when clinically indicated
- Assess for late effects (i.e. 5 years after treatment) annually: cardiovascular disease, screening for secondary cancers if RT was administered (chest X-ray for lung, mammogram/MRI breast)

### Key References:

1. Engert A, Plütschow A, Eich HT, et al: Reduced treatment intensity in patients with early-stage Hodgkin's lymphoma. *N Engl J Med.* 2010;363(7):640.
2. Canellos GP, Abramson JS, Fisher DC, et al.: Treatment of favorable, limited-stage Hodgkin's lymphoma with chemotherapy without consolidation by radiation therapy. *J Clin Oncol* 28 (9): 1611-5, 2010.
3. Meyer RM, Gospodarowicz MK, Connors JM, et al. ABVD alone versus radiation-based therapy in limited-stage Hodgkin's lymphoma. *N Engl J Med* 2011
4. Landgren O, Axdorph U, Fears TR, et al.: A population-based cohort study on early-stage Hodgkin lymphoma treated with radiotherapy alone: with special reference to older patients. *Ann Oncol* 17 (8): 1290-5, 2006.
5. Eich HT, Diehl V, Görge H et al: Intensified chemotherapy and dose-reduced involved-field radiotherapy in patients with early unfavorable Hodgkin's lymphoma: final analysis of the German Hodgkin Study Group HD11 trial. *J Clin Oncol.* 2010;28(27):4199
6. Diehl V, Sextro M, Franklin J, et al.: Clinical presentation, course, and prognostic factors in lymphocyte-predominant Hodgkin's disease and lymphocyte-rich classical Hodgkin's disease: report from the European Task Force on Lymphoma Project on Lymphocyte-Predominant Hodgkin's Disease. *J Clin Oncol* 17 (3): 776-83, 1999.
7. Duggan DB, Petroni GR, Johnson JL, et al: Randomized comparison of ABVD and MOPP/ABV hybrid for the treatment of advanced Hodgkin's disease: report of an intergroup trial. *J Clin Oncol.* 2003;21(4):607
8. Viviani S, Zinzani PL, Rambaldi A, et al: ABVD versus BEACOPP for Hodgkin's lymphoma when high-dose salvage is planned. *N Engl J Med.* 2011;365(3):203.
9. Bauer K, Skoetz N, Monsef I, et al: Comparison of chemotherapy including escalated BEACOPP versus chemotherapy including ABVD for patients with early unfavourable or advanced stage Hodgkin lymphoma. *Cochrane Database Syst Rev.* 2011
10. Gobbi PG, Levis A, Chisesi T, et al: ABVD versus modified stanford V versus MOPPEBVCAD with optional and limited radiotherapy in intermediate- and advanced-stage Hodgkin's lymphoma: final results of a multicenter randomized trial by the Intergruppo Italiano Linfomi. *J Clin Oncol.* 2005;23(36):9198
11. Gordon LI, Hong, F, Fisher RI, et al: A randomized phase III trial of ABVD vs Stanford V +/- radiation therapy in locally extensive and advanced stage Hodgkin's lymphoma: An intergroup study coordinated by the Eastern Cooperative Oncology Group (E2496); abstract 415Blood. 2010;116(21):185.
12. Horning SJ, Chao NJ, Negrin RS, et al: High-dose therapy and autologous hematopoietic progenitor cell transplantation for recurrent or refractory Hodgkin's disease: analysis of the Stanford University results and prognostic indices. *Blood.* 1997;89(3):801.

13. Gerrie A, Power M, Savage K et al. Chemoresistance Can Be Reliably Overcome with High-Dose Therapy and Autologous Stem Cell Transplantation (HDT/ASCT) for Relapsed and Refractory Hodgkin's Lymphoma. *Blood (ASH Annual Meeting Abstracts)* 2011 118: Abstract 2022.
14. Gutierrez-Delgado F, Holmberg L, Hooper H et al. Autologous stem cell transplantation for Hodgkin's disease: busulfan, melphalan and thiotepa compared to a radiation-based regimen. *Bone Marrow Transplant* 2003; 32(3):279-85.
15. Josting A, Franklin J, May M et al. New Prognostic Score Based on Treatment Outcome of Patients With Relapsed Hodgkin's Lymphoma Registered in the Database of the German Hodgkin's Lymphoma Study Group. *JCO*, 2002; 20 (1): 221-230.
16. Josting A, Sieniawski M, Glossmann JP, Staak O et al. High-dose sequential chemotherapy followed by autologous stem cell transplantation in relapsed and refractory aggressive non-Hodgkin's lymphoma: results of a multicenter phase II study. *Ann Oncol*. 2005 Aug;16(8):1359-65.
17. Kuruvilla J, Nagy T, Pintilie M et al. Similar response rates and superior early progression-free survival with gemcitabine, dexamethasone, and cisplatin salvage therapy compared with carmustine, etoposide, cytarabine, and melphalan salvage therapy prior to autologous stem cell transplantation for recurrent or refractory Hodgkin lymphoma. *Cancer* 2006; 106(2):353-60.
18. Lane A, McAfee S, Kennedy J et al. High-dose chemotherapy with busulfan and cyclophosphamide and autologous stem cell rescue in patients with Hodgkin lymphoma. *Leukemia & Lymphoma*, 2011; 52(7): 1363–1366.
19. Morschhauser F, Brice P, Fermé C et al. Risk-adapted salvage treatment with single or tandem autologous stem-cell transplantation for first relapse/refractory Hodgkin's lymphoma: results of the prospective multicenter H96 trial by the GELA/SFGM study group. *JCO* 2008; 26(36):5980-7.
20. Morschhauser F, Brice P, Fermé C, Diviné M, Salles G et al. Risk-adapted salvage treatment with single or tandem autologous stem-cell transplantation for first relapse/refractory Hodgkin's lymphoma: results of the prospective multicenter H96 trial by the GELA/SFGM study group. *JCO* 2008;26(36):5980-7.
21. Peggs K, Kayani I, Edwards N et al. Donor Lymphocyte Infusions Modulate Relapse Risk in Mixed Chimeras and Induce Durable Salvage in Relapsed Patients After T-Cell–Depleted Allogeneic Transplantation for Hodgkin's Lymphoma. *J Clin Oncol* 2011; 29:971-978.
22. Schmitz N, Pfistner B, Sextro M, Sieber M et al. Aggressive conventional chemotherapy compared with high-dose chemotherapy with autologous haemopoietic stem-cell

transplantation for relapsed chemosensitive Hodgkin's disease: a randomised trial. *Lancet* 2002; 359:2065-71.

23. Sibon D, Resche-Rigon, Morschhauser F et al. Long-Term Prognostic Significance of Response in Hodgkin Lymphoma Before Autologous Stem Cell Transplantation :Results of the Prospective Multicenter H96 Trial by the GELA/SFGM-TC Study Group. *Blood (ASH Annual Meeting Abstracts)* 2011 118: Abstract 3070.
24. Sucak GT, Özkurt ZN, Suyani E et al. Early post-transplantation positron emission tomography in patients with Hodgkin lymphoma is an independent prognostic factor with an impact on overall survival *Ann Hematol* (2011) 90:1329–1336.
25. Thomson K, Peggs K, Smith P et al. Superiority of reduced-intensity allogeneic transplantation over conventional treatment for relapse of Hodgkin's lymphoma following autologous stem cell transplantation. *Bone Marrow Transplantation* 2008; 41: 765–770.
26. Visani G, Malerba L, Stefani PM et al. BeEAM (bendamustine, etoposide, cytarabine, melphalan) before autologous stem cell transplantation is safe and effective for resistant/relapsed lymphoma patients. *Blood* 2011; 118: 3419-3425.
27. Viviani S, Zinzani P, Rambaldi A et al. ABVD versus BEACOPP for Hodgkin's Lymphoma When High-Dose Salvage Is Planned. *NEJM* 2011;365:203-12.

GHSg: German Hodgkin's Study Group

**Meeting Chair:** Dr. Julie Stakiw

**Compilers of Guideline:** Dr. Arbind Dubey, Dr. Haji. Chalchal, Dr. Mohamed Elemetry , Dr. Ali El-Gayed, Dr. Waleed Sabry Ismail, Dr. Mohammad Khan, Dr. Evgeny Sadikov, Dr. Julie Stakiw, Dr. Mohammad Salim, Dr. Vamsee Torri Dr. Philip Wright