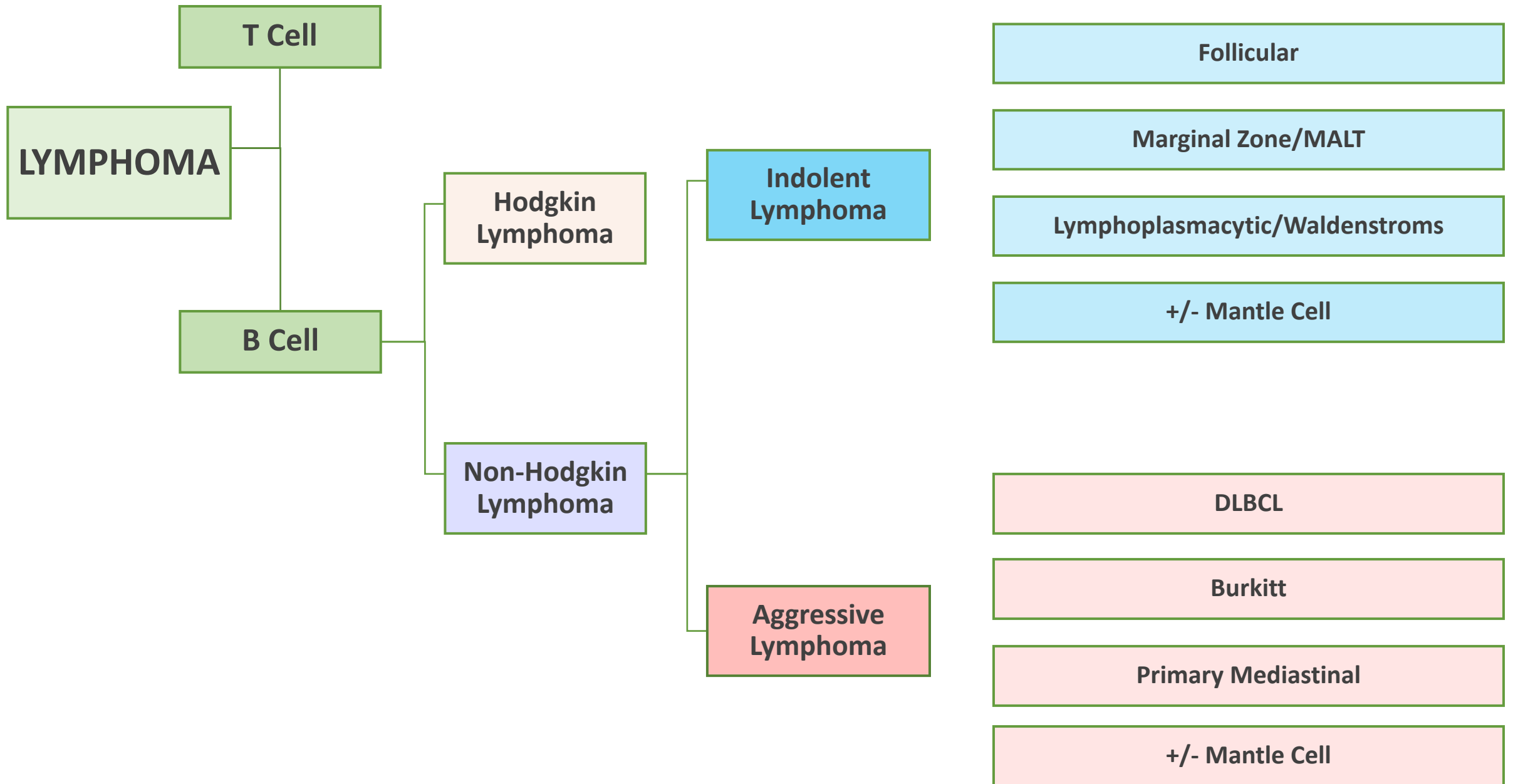


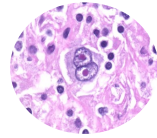
B CELL LYMPHOMA Reference Handout



HL Pathology & Histology

Hodgkin's Lymphoma

Presence of Reed-Sternberg Cells



Non-Hodgkin's Lymphoma (NHL)

Absence of Reed-Sternberg Cells

Classical HL = 95%

Non-Classical HL = 5%

Nodular Sclerosis

Nodular Lymphocytic
Predominant HL

Mixed

Lymphocyte Rich

Lymphocyte Poor

HL Risk

Risk Factors

Age

(Bi-modal: 20's, 60s)

Immunosuppression

Autoimmune Disease

Infections (HIV, EBV)

HL Diagnosis

#1

Excisional LN Biopsy → DIAGNOSIS

Histology

Reed Sternberg Cells

Flow Cytometry

CD15+/CD30+

** NLPHL sub-type is CD20+

#2

PET Scan → STAGING

Deauville Score

| | |
|---------|--------------------------------|
| Score 1 | No uptake |
| Score 2 | Uptake < Liver |
| Score 3 | Uptake similar to Liver |
| Score 4 | Update moderately > Liver |
| Score 5 | Update markedly > Liver |

HL/NHL staging

Ann Arbor Staging

| | |
|-----------|---|
| Stage I | 1 LN |
| Stage II | 2+ LN <u>same side</u> diaphragm |
| Stage III | 2+ LN <u>both</u> sides diaphragm |
| Stage IV | Extra-Nodal Organ |
| A/B | A = No B symptoms B = Yes B symptoms |
| X | Bulky Disease: 1. Mediastinal mass > 1/3 diameter thorax 2. Mass > 10 cm |

HL Chemotherapy

ABVD

side effects

| | |
|----------------------|----------------------|
| A Doxorubicin | * cardiac toxicity |
| B Bleomycin | * pulmonary toxicity |
| V Vinblastine | * neuropathy |
| D Dacarbazine | |

General Side Effects:
myelosuppression, infertility, secondary malignancy

BEACOPP

Stanford V

MOPP

HL Treatment Paradigm

Classic HL Treatment Stage I- IIA

2-4 Cycles ABVD + RT

* 4 cycles if unfavorable
(bulky disease, B symptoms, 3+ LN)

Classic HL Treatment Stage IIB-IV

6 Cycles ABVD +/- RT

* RT if bulky disease

TREATMENT RESPONSE MONITORING

- Usually get re-staging PET after cycle 2 to assess response (goal Deauville <3)

PULMONARY CONSIDERATIONS

- ** Can omit bleomycin in cycle 3-6
- ** Can replace bleomycin with brentuximab if bad lung disease

HL Prognosis

Prognosis

Cure > 80% Patients

Early Stage >90% 5 yr OS

Late Stage > 75% 5 yr OS

Poor Prognostic Factors

Age >45

Male

Stage IV

WBC > 15 or lymphopenia

Hemoglobin < 10.5

Albumin < 4

* Positive PET after 2 cycles
chemotherapy

Aggressive NHL

DLBCL

- Most common NHL (25%)
- Primary or Secondary disease

Flow Cytometry

CD10+, CD20+

Cytogenetics

BCL2 = t(14;18), t(3;14)

BCL6 = t(3;V)

C-MYC = t(2;8), t(8;14), t(8,22)

DOUBLE HIT DLBCL = mutations in **MYC** and **BCL2 +/- BCL6**

RCHOP

R Rituximab

C Cyclophosphamide

H Doxorubicin

O Vincristine

P Prednisone

Aggressive NHL

Burkitt Lymphoma

Flow Cytometry

CD10+/CD20+

Cytogenetics

C-MYC = t(2;8), t(8;14), t(8,22)

Histology

"starry sky"

1) Endemic (EBV)

2) Sporadic

2) Immunodeficiency Associated (HIV, post-transplant)

R-HyperCVAD

R Rituximab

C Cyclophosphamide

V Vincristine

A Doxorubicin

D Dexamethasone

IT MTX/ARAC alternating

Aggressive NHL

Primary Mediastinal B-Cell Lymphoma

Flow Cytometry

CD20+, CD10 +/-, CD30 +/-

Cytogenetics

CIITA t(16;X)

- From thymic (medullary) B cells
- Rapidly enlarging, symptomatic mass: can have airway compromise or SVC syndrome

R-EPOCH

R Rituximab

E Etoposide

P Prednisone

O Vincristine

C Cyclophosphamide

H Doxorubicin

+/- Aggressive NHL

Mantle Cell Lymphoma

Flow Cytometry

CD5+/CD23-, Cyclin+

Cytogenetics

Cyclin = t(11;14)

Stage I-II → Chemo + RT

Stage IIB-IV → Chemo + AutoSCT

Chemotherapy Options

RCHOP

R-HyperCVAD

R-Bendamustine

* Better if older/poor ECOG

Relapsed/Refractory

BTK Inhibitor: Ibrutinib, Acalabrutinib

Lenalidomide

CAR-T

Indolent NHL

Follicular Lymphoma

Flow Cytometry

CD10+/CD20+

Cytogenetics

BCL2 = t(14;18)

Histology

Grade 1-2 = LOW GRADE

< 15 centroblasts/hpf

Grade 3 = HIGH GRADE

> 15 centroblasts/hpf

Limited Stage I-II
Low Grade



Observation
RT (curative)
Rituximab

Advanced Stage III-IV
Low Grade



Observation
Rituximab
R-CHOP
R-Bendamustine
R- Lenalidomide
R- CVP

High Grade



Treat like DLBCL: R-CHOP

* Maintenance therapy w/ rituximab x2Y improves PFS

FLIPI

Age > 60

Node Sites > 4

Elevated LDH

Hb < 12

Ann Arbor III-IV

Low = 0-1
Intermediate = 2
High = 3-5

Indolent NHL

Marginal Zone Lymphoma/MALT Lymphoma

Flow Cytometry

CD20+, MUM1+

Cytogenetics

t(11;18)

- “Marginal Zone” = lymphoma that grows at edge or margin of lymphoid tissue
- Can involve any organ
- MALT = mucosal associated lymphoid tissue = type of MZL
- Associated with autoimmune conditions, infections

Gastric MALT

| | |
|--------------------------|-----------------------------------|
| Stage I-II + H.pylori | Treat H.pylori |
| Stage I-II - H.pylori | RT Rituximab |
| Stage III-IV | RT Rituximab Systemic Chemo |

Splenic Marginal Zone Lymphoma

| | |
|---------------------|-----------------------------------|
| Stage I-II + HCV | Treat HCV |
| Stage I-II - HCV | Splenectomy Rituximab |
| Stage III-IV | RT Rituximab Systemic Chemo |

Indolent NHL

Lymphoplasmacytic Lymphoma/ Waldenstroms Macroglobulinemia

Flow Cytometry

CD20+
CD25+/-, CD38+/-

Cytogenetics

PAX5 = t(9;14)

- Lymphoplasmacytic precursors
- Produces IgM
- Complications:
hyperviscosity
cryoglobulinemia
cold agglutinin

Proteasome-Based:

Bortezomib, Rituximab, Dexamethasone

Chemo-Based:

R-CHOP, R-Bendamustine

TKI: Ibrutinib