

20TH

**INTERNATIONAL
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SYMPOSIUM**

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**How Many Scans
Are Too Many?**

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Disclosures

I have no relevant financial affiliations to disclose.

Why do we scan?

To provide accurate assessment of disease status

Staging

Response to treatment

Interim, End of Treatment

Surveillance

Introduction

“Perhaps one point on which all investigators can agree is that the proper management of lymphoma requires a pathological diagnosis made by an experienced hematopathologist and a thorough staging workup to assess the extent of disease at the time of diagnosis. Only with an exact pathological diagnosis and an accurate assessment of disease status can the best interests of the patient be served.”

ER Gaynor and JE Ultmann NEJM 1984; 311(23):1506-8

Staging: Historical Perspective

“At the present time these (abdominal) nodes are best evaluated at laparotomy and should not be considered negative simply because of a negative lymphangiogram”

“Accurate diagnosis of the splenic involvement by Hodgkin’s disease requires removal of the spleen”

Symposium on Clinical Signs of Blood Disease

Staging of Hodgkin’s Disease and Lymphoma

**Diagnostic Procedures Including Staging Laparotomy
and Splenectomy**

Richard K. Desser, M.D., Edgar M. Moran, M.D.,**
and John E. Ultmann, M.D.****

Staging: Historical Perspective

“Computed tomography (CT) has revolutionized the clinical evaluation of patients with NHL.”

Ultmann, JE and Jacobs, R. Ca Cancer J Clin. 1985;35(2):66-87

Study	Indication
Complete Blood Count (Including Differential and Platelet Count)	All patients
Erythrocyte Sedimentation Rate (ESR)	All patients
Urinalysis	All patients
Routine Chemistries (Including Calcium and Uric Acid)	All patients
Liver Function Tests	All patients
Kidney Function Tests	All patients
Serum Protein Electrophoresis (SPEP)	All patients
Serum Immunoelectrophoresis with Quantitation	All patients with an abnormal SPEP
Chest X-ray (CXR)	All patients
Bone Marrow Aspirate and Four Bone Core Biopsies	All patients
Lumbar Puncture with Cytology	DHL with a positive bone marrow Lymphoblastic lymphoma Undifferentiated lymphoma Any histology with an unexplained alteration in mental status

Abdominal/Pelvic CT scan	All patients
Chest CT Scan	All patients with an abnormal CXR
Intravenous Pyelogram	All patients with a renal abnormality on CT scan
Gallium Scan	Patients with intermediate and high-grade lymphomas
Bone Scan	All patients
Liver-Spleen Scan	All patients
Lymphangiogram	Patients with clinical stage I and II disease above the diaphragm with a negative abdominal/pelvic CT scan in whom the discovery of abdominal disease would alter treatment

Staging: Lugano Recommendations

PET-CT should be used for staging; not routinely recommended in lymphomas with low FDG avidity.

PET-CT may be used to select the best site to biopsy.

PET-CT may obviate the need for bone marrow biopsy in HL and aggressive NHL.



Interim: Lugano Recommendations

If performed, PET-CT is superior to CT

Changing treatment solely on basis of iPET-CT not recommended unless clear progression



End of treatment: Historical Perspective

“Once patients have completed definitive therapy, restaging should commence with a repeat of all previously abnormal radiographs, radionuclide scans, if done, and CT scans.”

Uitmann JE and Bitran JD, *Current Opinion in Oncology* 1989;1:17-22

End of Treatment: Lugano Recommendations

PET-CT is standard of care for remission assessment in FDG-avid lymphoma

Biopsy required if residual metabolically active tissue is present and salvage therapy is being considered



Surveillance scans in DLBCL

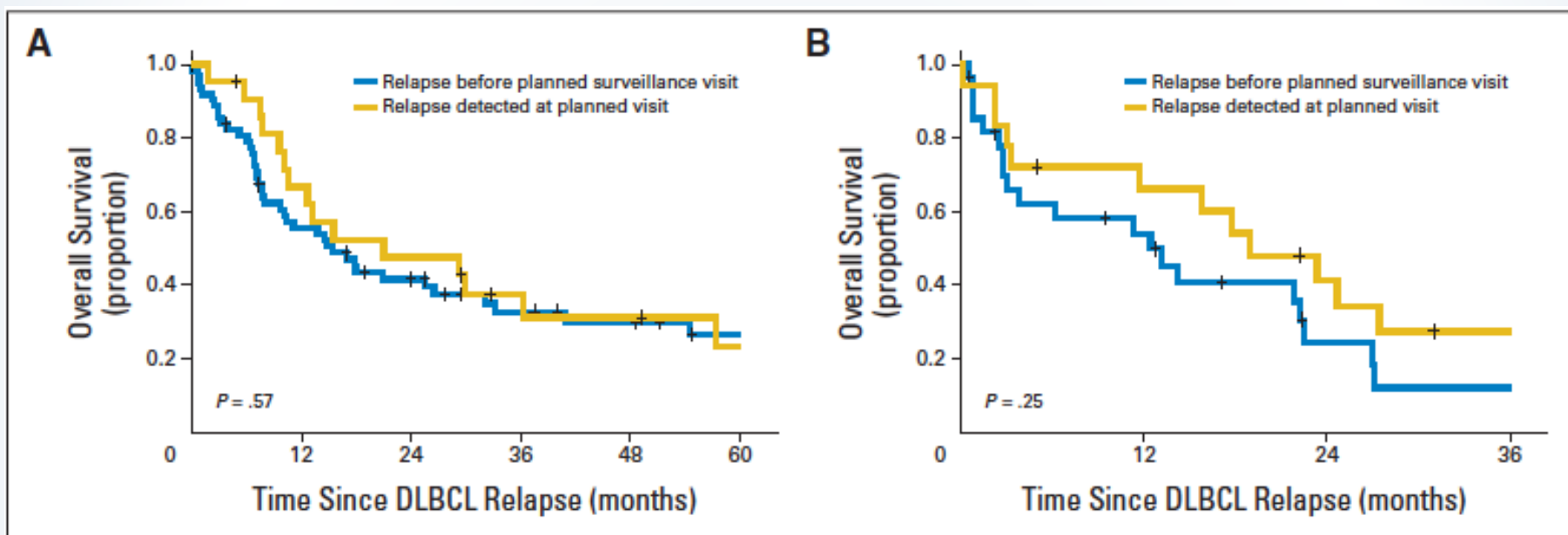


Fig 2. (A) Overall survival of 112 patients with relapsed diffuse large B-cell lymphoma (DLBCL) from Molecular Epidemiology Resource cohort. (B) Overall survival of 55 patients with relapsed DLBCL from Lyon cohort.

Surveillance Scans In HL

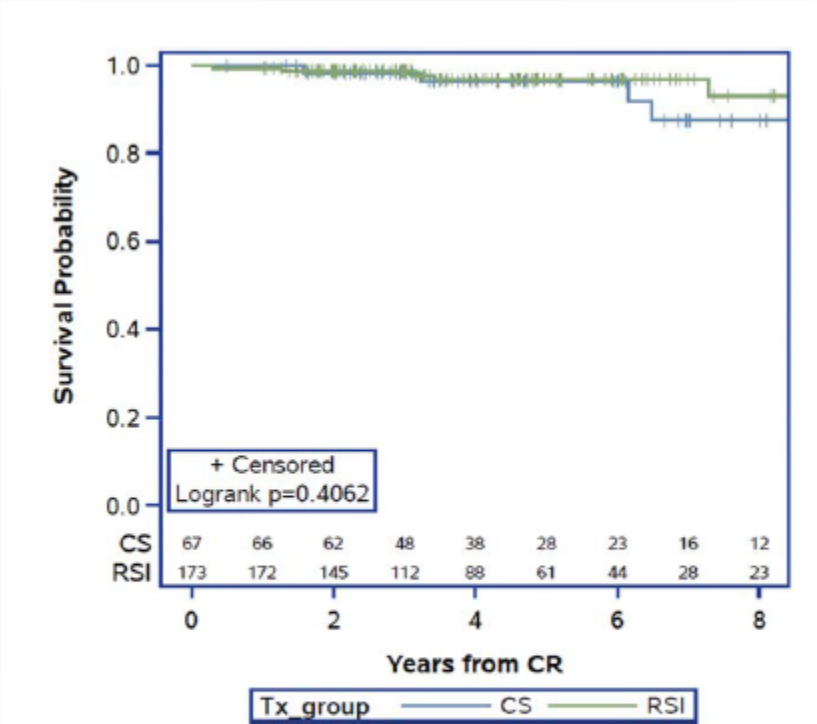


Figure 1. The probability of survival among patients with classical Hodgkin lymphoma is illustrated according to treatment (Tx) group for those who received clinical surveillance (CS) and those who received routine surveillance imaging (RSI). CR indicates complete remission.

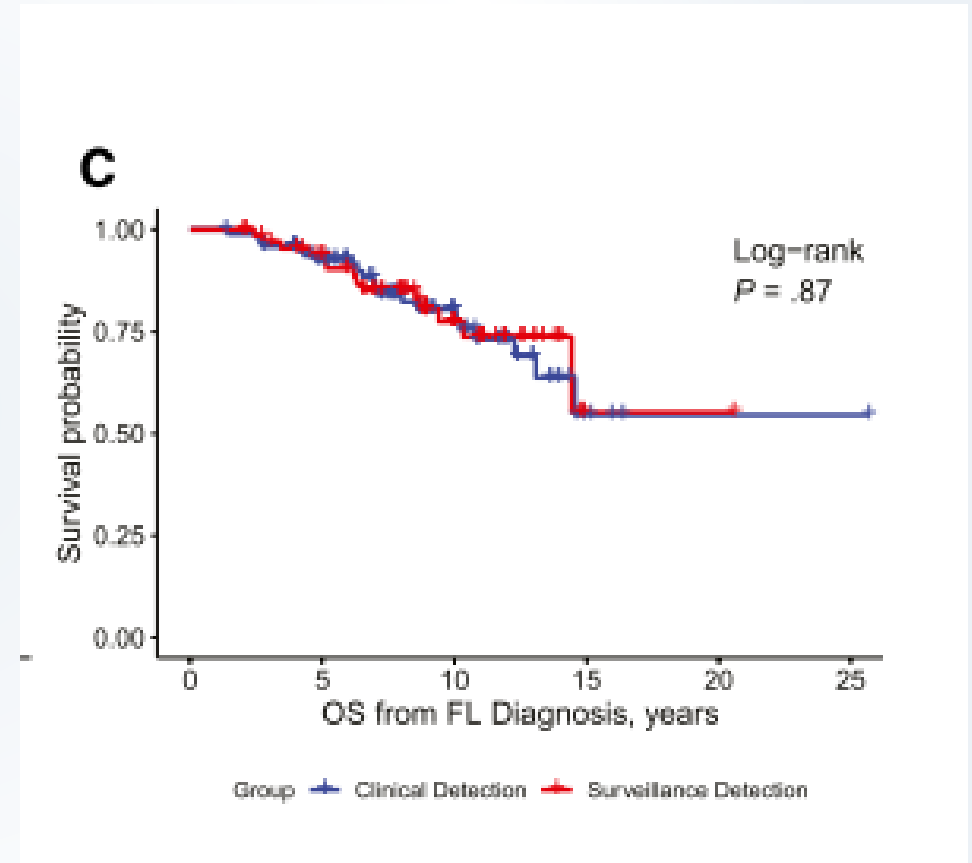
Surveillance Scans in Indolent Lymphoma

Retrospective studies report low yield of imaging post-therapy

6% of pts had FL relapse documented by solely by routine CT scans; 37% of MCL relapses

No difference in OS whether relapse detected clinically vs imaging

NNT = 24-28 CT scans to detect 1 relapse



Radiology 1999; 210:483-486
Cancer 2021;127(18):3390-3402
Leuk Lym 2018; 59:888-895

Surveillance: Recommendations

Lugano Recommendations

Routine surveillance scans after remission are not recommended

ASH Choosing Wisely

Limit surveillance CT scans in asymptomatic patients after curative-intent tx for aggressive lymphoma



JCO 2014; 32:3048-3058
Blood 2013; 122:3879-3883

What Are the Downsides of Surveillance Scans?

Radiation

False Positives

Anxiety

Cost

The Patient Experience

“Dr. Ultmann was well-known for his ability to make patients and their families feel comfortable...he taught compassionate care to medical students”

Chicago Tribune, Oct. 25, 2000

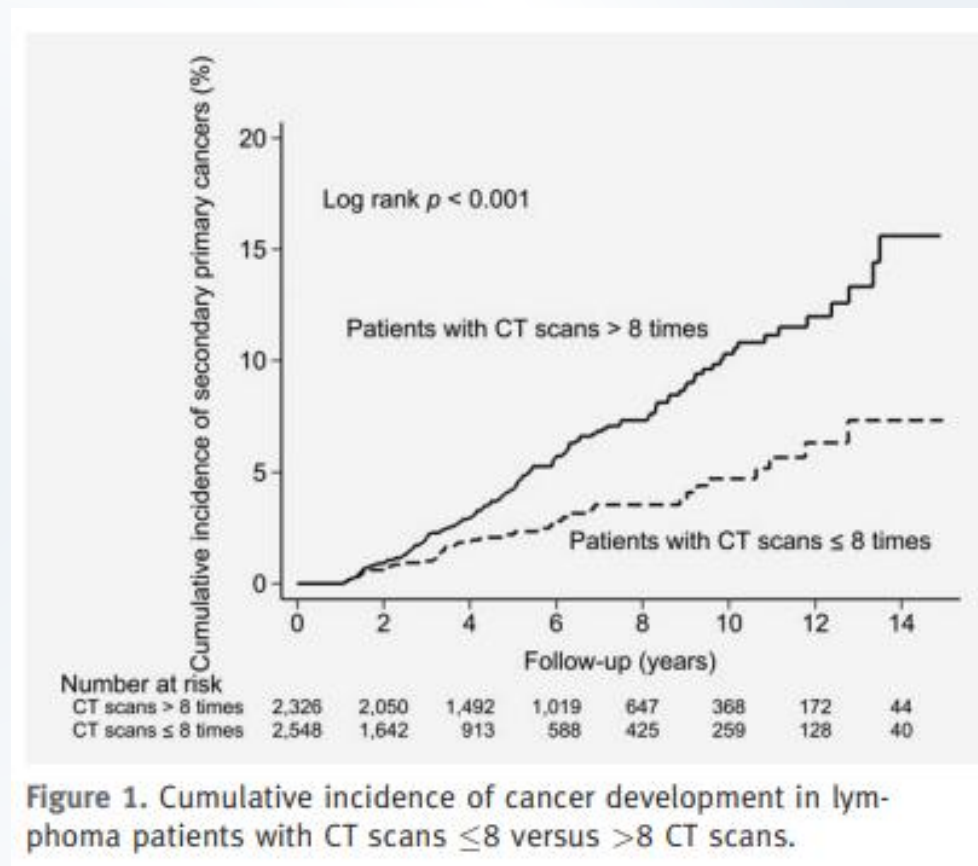
Concern	Percentage of Sample
Fear of recurrence	27-40%
Concern that symptom indicated recurrence	34-41%
Fear of secondary cancer	26-36%
Future diagnostic tests	36-44%

Deimling et al.;*Psycho-Oncology*;2002;11:479-94

Risk of Radiation Exposure

Population based study of NHL patients treated with curative intent 1997-2020

Frequent surveillance CT scans associated with increased risk secondary malignancies



False Positive Surveillance PET Scans

43% of abnormalities on PET after lymphoma treatment are false positives

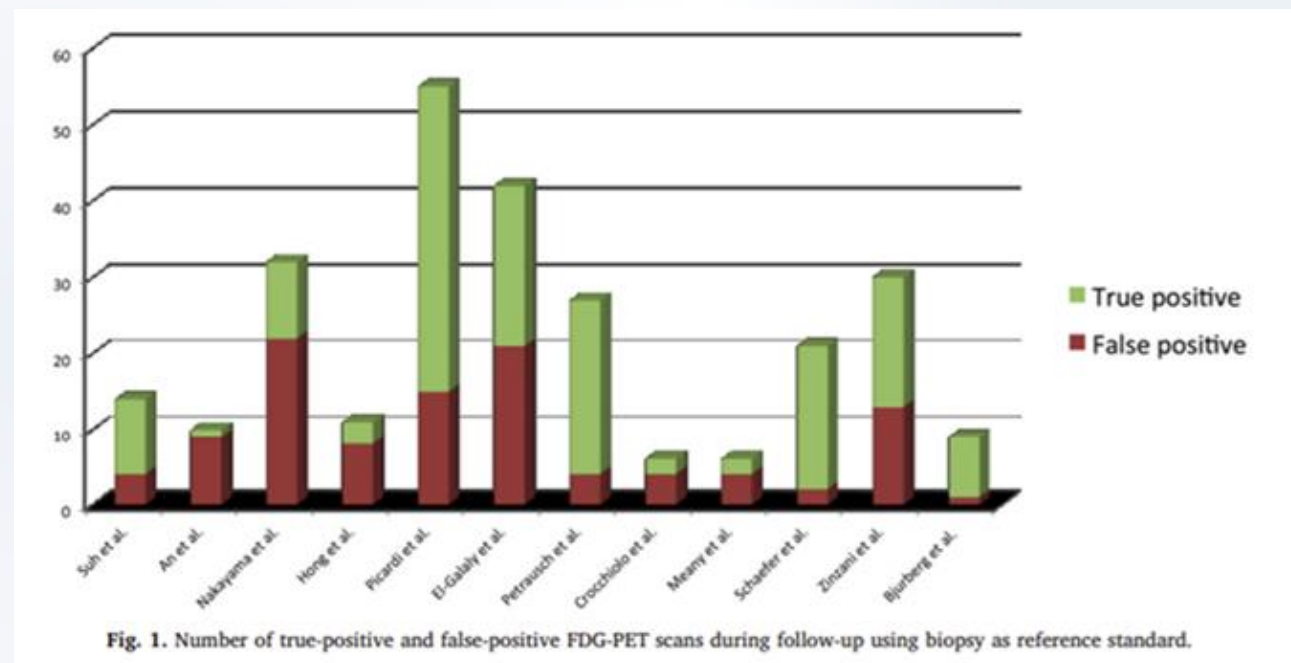
Causes:

Benign reactive lymph nodes

Sarcoidosis

Thymic hyperplasia

Fibrosis



Scan-itis in Lymphoma Survivors

70 lymphoma survivors in CR

Median 4.9 years (2.4-38.0 years) from diagnosis

37% clinically significant anxiety

Fear of recurrence heightened around time of scans

Anxiety peaks before a scan and drop following result visit

Summary: How Many Scans Are Too Many?

Imaging scans are vital to assess:

Stage

Response to therapy

Investigation of new symptoms during surveillance

Scans performed outside of these indications are “too many”

“While there are general principles that apply to the diagnosis and management of these patients, individual cases present many problems that remain controversial for even the most experienced oncologist.”

Ultmann, JE and Jacobs, R. *Ca Cancer J Clin.* 1985;35(2):66-87

THANK YOU!

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