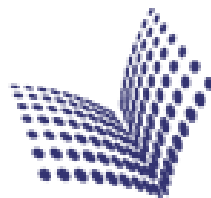


Examining the utilization of CT or PET-CT for routine surveillance of asymptomatic lymphoma patients in remission in Israel; evidence-based groundwork for a “choosing wisely” recommendation

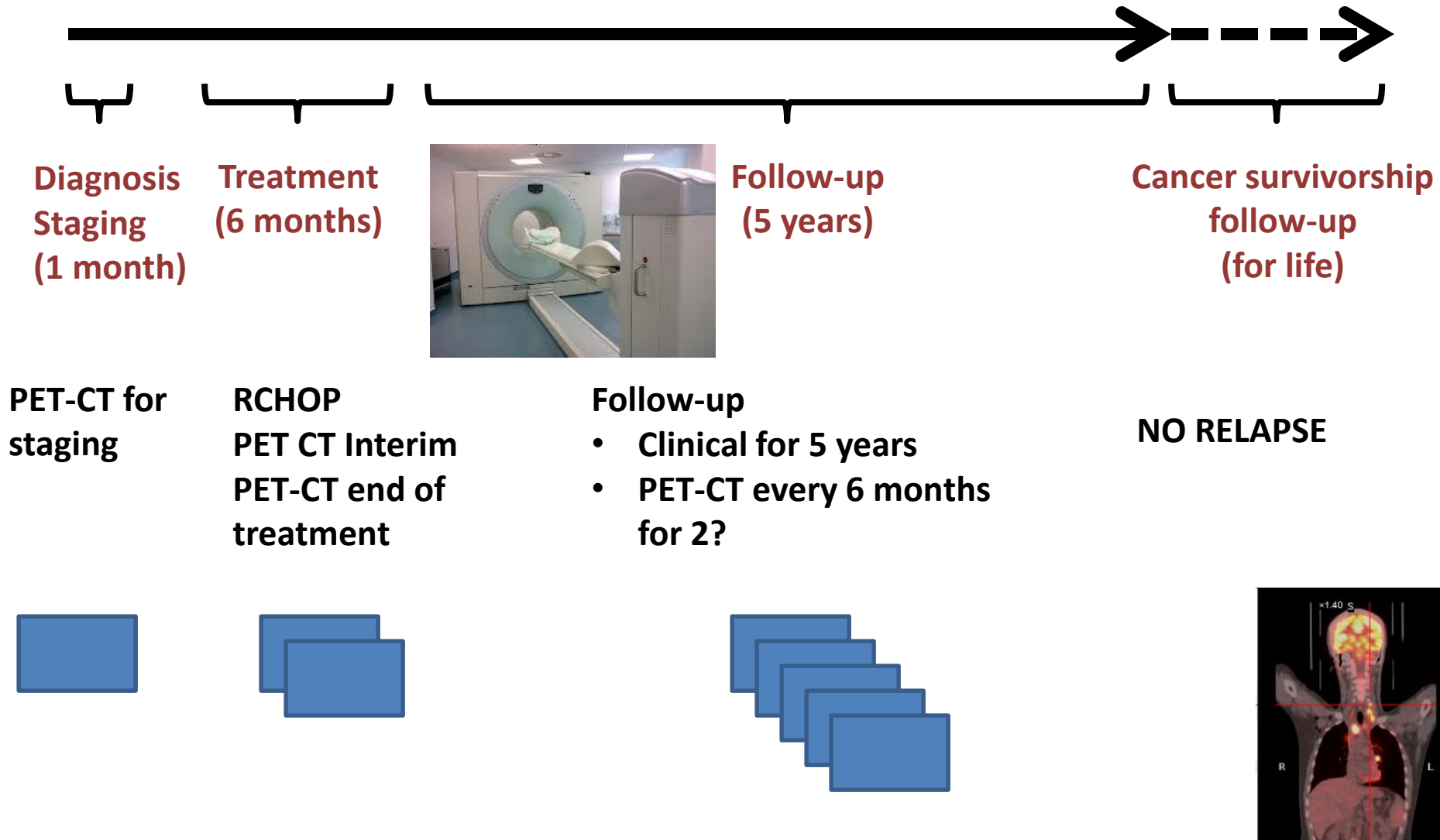
O. Paltiel, N. Goldschmidt, R. Bar Shalom,
T. Rechavi, E. Dann

Hadassah, Shaare Tzedek, Rambam Medical Centers

בית הספר לבריאות הציבור ורפואה קהילתית
של האוניברסיטה העברית והדסה ע"ש בראון
Braun School of Public Health and Community Medicine
Hebrew University - Hadassah

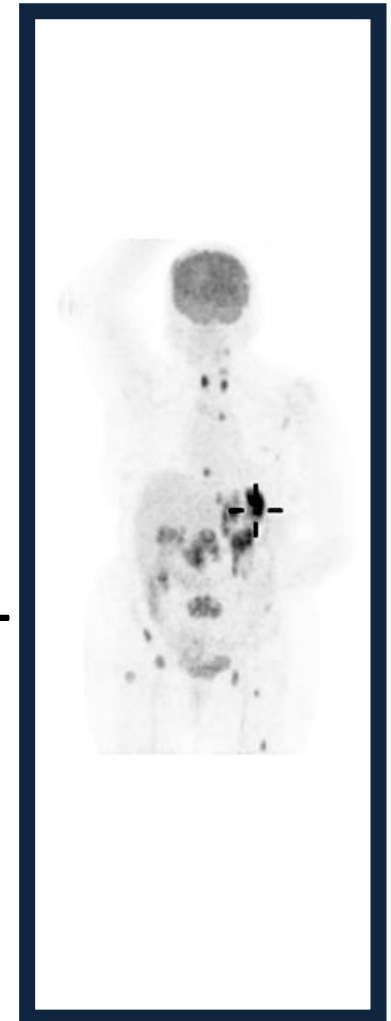


The clinical course of a lymphoma patient treated with curative intent

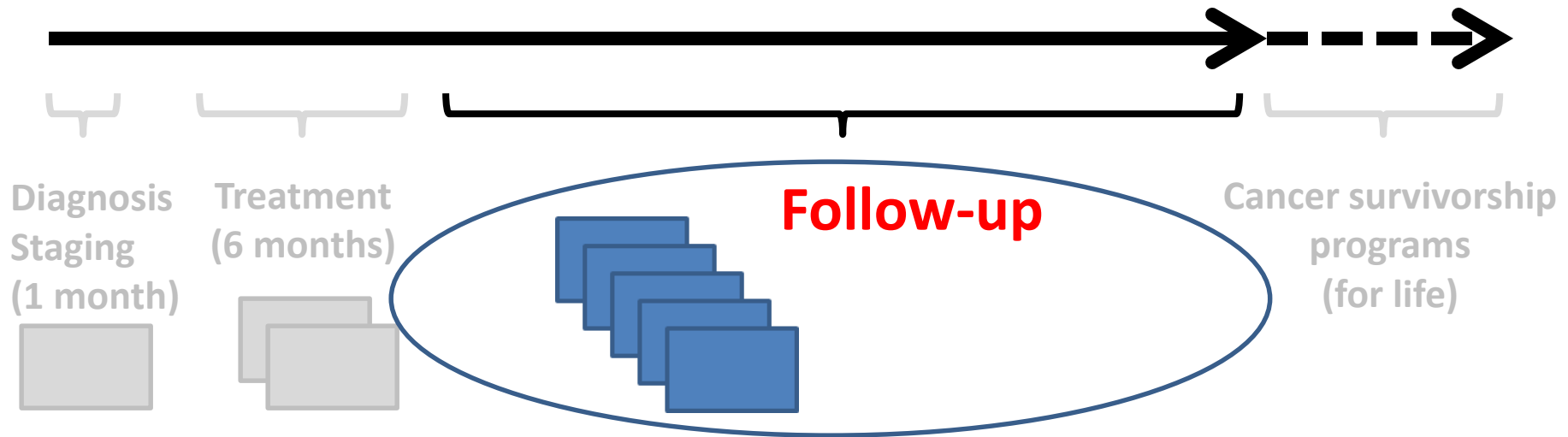


How did we come to be so dependent on the imaging studies?

- It works: HIGH SENSITIVITY 95-100%
- Therapeutic implications at **diagnosis**
- Prognostic value of **interim PET CT** in HL
- The value of **end of treatment PET CT**



PET CT in routine follow-up?



Assumptions:

- High sensitivity and specificity will be applicable here as well- **NO**
- Early diagnosis of relapse may improve survival-**NO**

Not just us:

Follow-up study: 603 DLBCL patients in remission, 7 US centers

Type of studies received in follow-up window

	None	CT only	PET only	PET and CT	Overall	<i>p</i> -Value [†]
<i>n</i>	25	292	88	198	603	
%	4.2	48.4	14.6	32.8	100.0	
Average number of studies per year						
Median	0.0	2.5	2.0	3.0	2.5	<0.0001
Minimum	0.0	0.5	0.5	1.0	0.0	
Maximum	0.0	6.0	3.5	8.0	8.0	

DLBCL, diffuse large B-cell lymphoma; CT, computed tomography; PET, positron emission tomography.

*Follow-up defined as starting from the end date of first-line therapy + 90 days to 2 years of follow-up or relapse.

125 relapsed lymphoma patients

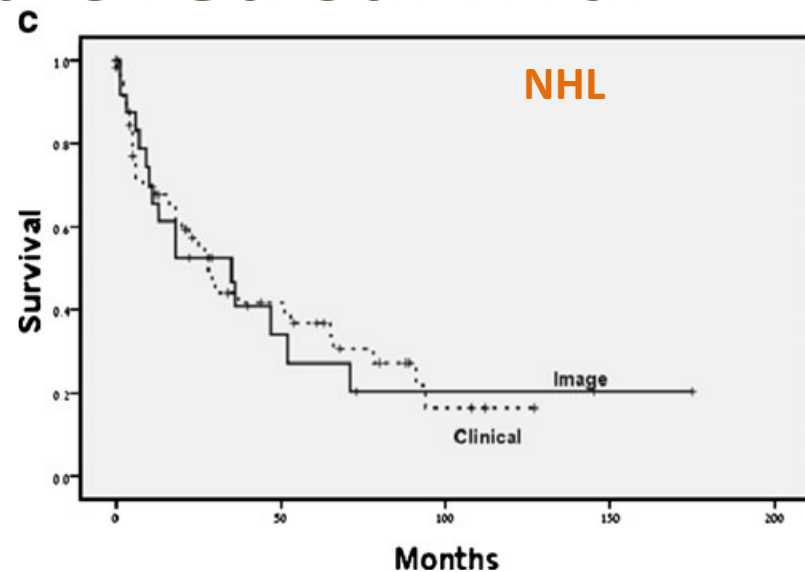
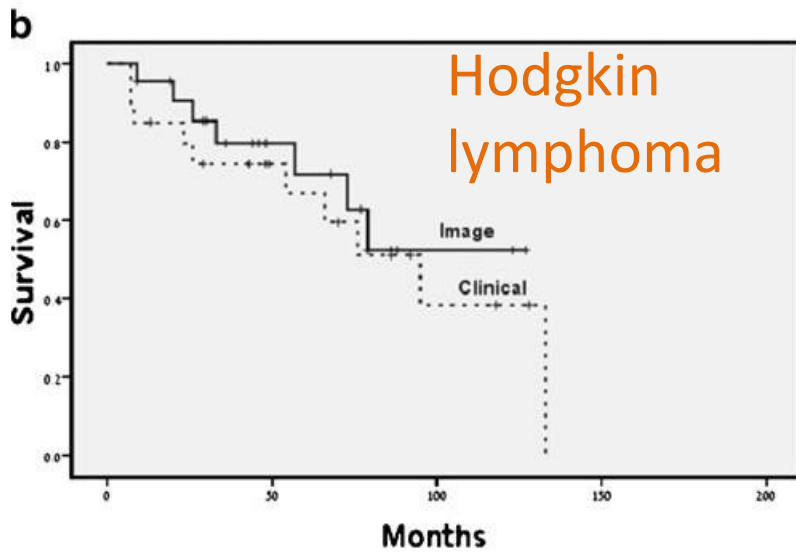
Ann Hematol (2011) 90:165–171
DOI 10.1007/s00277-010-1044-8

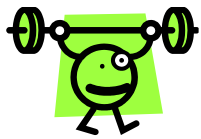
ORIGINAL ARTICLE

The role of routine imaging procedures in the detection of relapse of patients with Hodgkin lymphoma and aggressive non-Hodgkin lymphoma

Neta Goldschmidt · Omer Or · Martine Klein ·
Bella Savitsky · Ora Paltiel

Most relapses were diagnosed clinically Imaging-detected relapses were not associated with improved survival





The weight of the evidence

Radiology. 2014 Apr 6:132154. [Epub ahead of print]

**Advanced-stage Hodgkin Lymphoma: US/Chest Ra
for Detection of Relapse in Patients in First Compl
Remission-A Randomized Trial of Routine Sur
Imaging Procedures.**

Picardi M¹, Pugliese N, Cirill
Salvatore C

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No evidence that imaging in routine follow up of lymphoma patients in remission has clinical benefit

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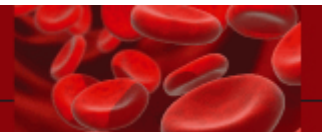
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remission following primary thera

Chan
David S.
Kate Burbury
Dennis A. Carney

American Journal of

Hematology



Research Article

Strikingly high false positivity of surveillance FDG-PET/CT scanning among patients with diffuse large cell lymphoma in the rituximab era

Irit Avivi,^{1,2*} Ariel Zilberlicht,¹ Eldad J. Dann,^{1,2} Ronit Leiba,³ Tal Faibish,¹ Jacob M. Rowe,^{2,4} and Rachel Bar-Shalom^{2,5}

Costs

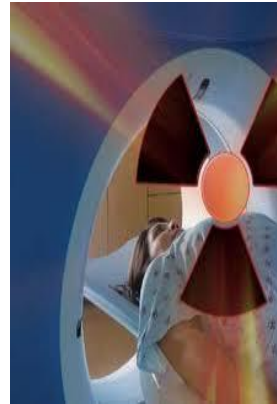


About \$1300 per scan



It's (not) all about the money
dum dee dum dum dum dum

1 x



PET CT

= 80-140 x

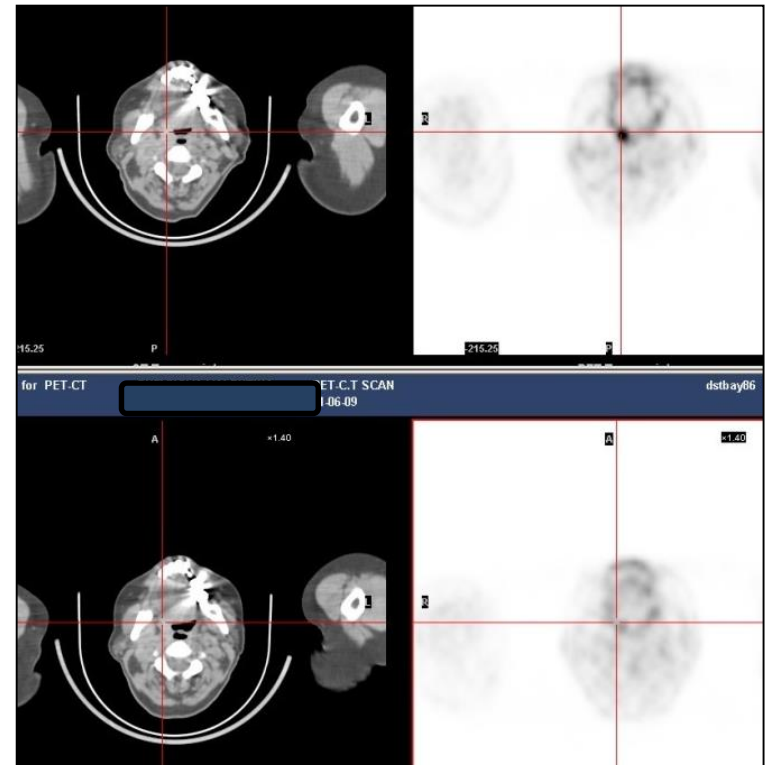
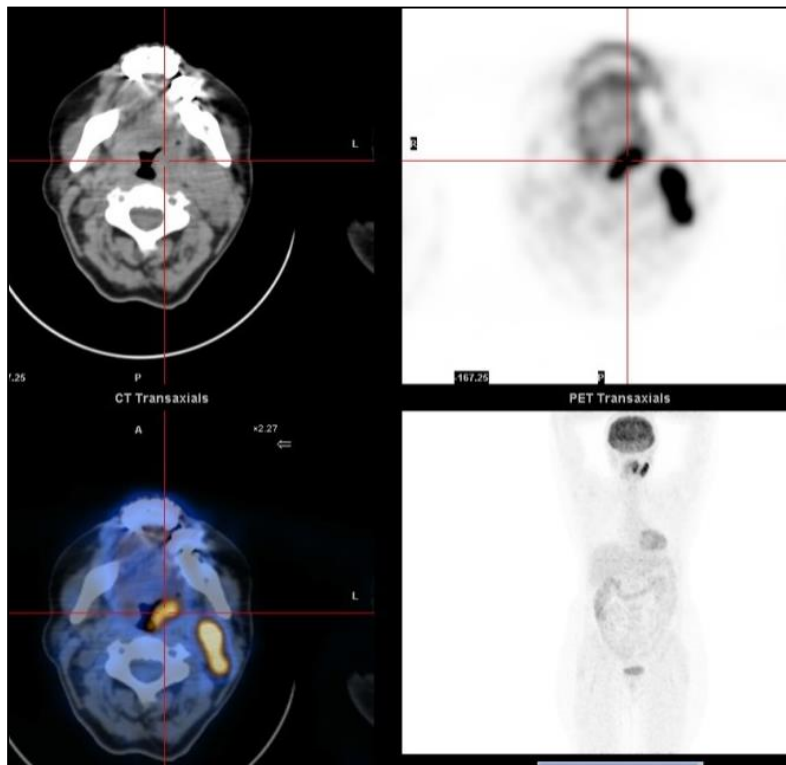


Chest X-ray

Low positive predictive value (PPV): False positive

57 YO female
DLBCL of the left tonsil
RCHOP X 6 ---> CR

At follow-up:
Uptake in the oropharynx
Surgical excision: reactive



Anxiety



original article

Annals of Oncology 21: 2262–2266, 2010
doi:10.1093/annonc/mdq215
Published online 27 April 2010

Surveillance CT scans are a source of anxiety and fear of recurrence in long-term lymphoma survivors

C. A. Thompson^{1*}, M. E. Charlson², E. Schenkein³, M. T. Wells⁴, R. R. Furman³, R. Elstrom³, J. Ruan³, P. Martin³ & J. P. Leonard³

37% clinically significant anxiety

One patient referred to the experience as “scan-itis”

One participant stated that they are “terrorizing”

Benefits: Reassurance

- **However, there is a positive side as well**—both physicians and patients are reassured that the disease is in remission.
- “I have a lease on life for one year and I can start all over again.”
- “but as far as the experience I really hate it.”





Mixed methods study

To assess:

- Rates, reasons and costs of false positive (FP) CT-PET in setting of treatment of lymphoma for curative intent
 - ❖ Quantitative study
- Attitudes of professionals and patients to surveillance imaging after curative treatment for lymphoma in Israel
 - ❖ Qualitative study



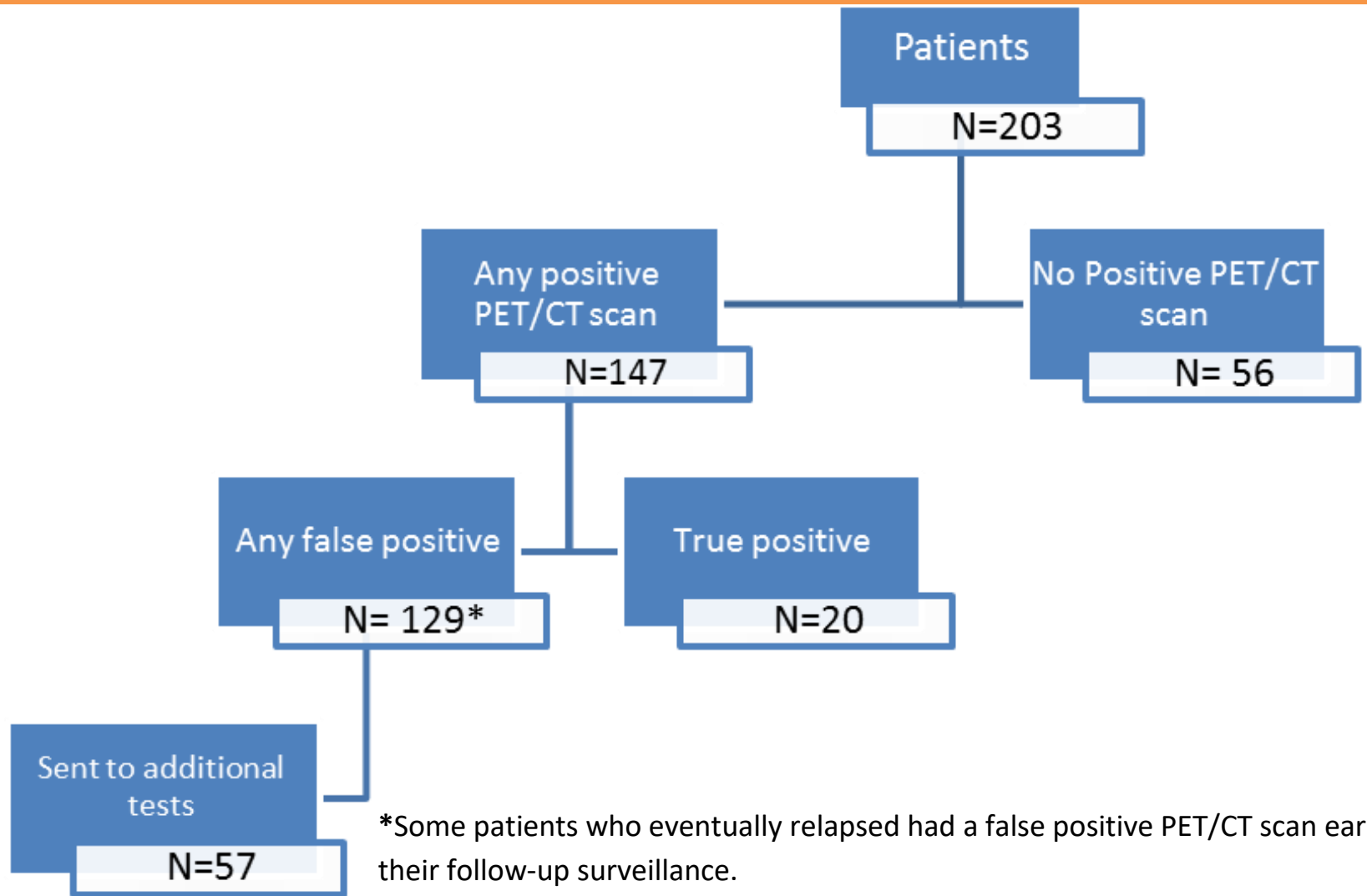
Study Methods

1. FP rates of **215** lymphoma patients in routine follow-up, Hadassah (**Data set 1**).
2. FP rates, resultant interventions and costs for **203** patients with Hodgkin lymphoma participating in a clinical trial who underwent surveillance scans in remission (**Dataset 2**)
3. **4 focus-groups** among patients- 2 cities
4. **In-depth interviews** with Hematologists and Nuclear Physicians, and nursing/support staff- 3 cities

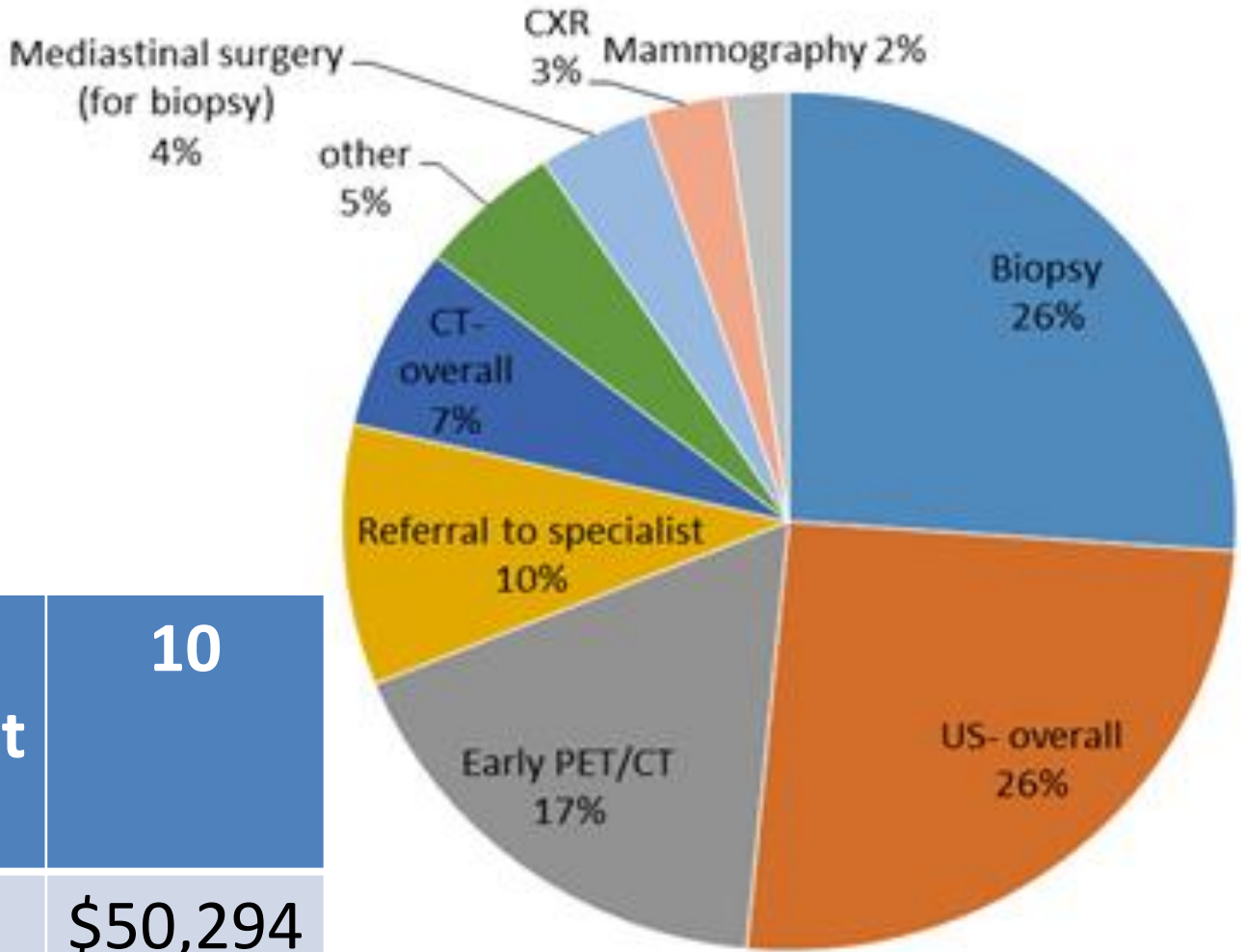
Results 1: Surveillance PET CT accuracy

	Number of tests	Sensitivity %	Specificity %	PPV%	NPV%
All	215	89	71	32	98
Indolent lymphoma	36	90	77	60	95
Hodgkin lymphoma	74	100	71	20	100
T-cell lymphoma	10	67	71	50	83
DLBCL	95	90	69	26	98
All					
Nodal		100	99	60	100
Extranodal		83	99	27	99
Site initially involved					
Yes				62	
No				42	

Results 2: 203 Hodgkin Lymphoma patients undergoing PET-CT surveillance in a clinical trial



Results 2 cont'd: Additional Procedures Stemming from False Positive CT- PET



Number needed to image to detect one relapse	10
-----------------------------------------------------	-----------

Cost per relapse detected	\$50,294
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Gal-Or Raviv, MD Thesis

3. Focus Groups



Patients

- Believe in the accuracy of CT-PET
- Both reassured and made anxious by surveillance imaging
- Perceive the risk of surveillance as due to radiation alone
- Are not concerned/aware of the cost of FP findings
- Trust in the physician and explanation can reassure patients that surveillance imaging is unnecessary

4. In-depth interviews with physicians and health personnel



- There is overuse of surveillance imaging
- Reasons for doing: patient reassurance, habit, clinical risk
- Reasons for not doing: radiation, cost, patient anxiety and discomfort, risk of false positive
- Drs. want guidelines from their professional organization, not restrictions or decrees from the MoH (which could lead to underuse)
- Drs. believe that education and discussion can convince asymptomatic patients of decreased need for surveillance imaging

Conclusions



- There is clear evidence of overuse of surveillance imaging in asymptomatic patients
- Overuse is expensive, results in unnecessary testing due to high false positive rates
- Patients are willing to accept reducing surveillance imaging and are unaware of the risk of FP
- Physicians are ready for self-regulation but not regulation by decree to reduce overuse
- Extensive evidence-base for local “choosing wisely” recommendation



5

Limit surveillance computed tomography (CT) scans in asymptomatic patients following curative-intent treatment for aggressive lymphoma.

CT surveillance in asymptomatic patients in remission from aggressive non-Hodgkin lymphoma may be harmful through a small but cumulative risk of radiation-induced malignancy. It is also costly and has not been demonstrated to improve survival. Physicians are encouraged to carefully weigh the anticipated benefits of post-treatment CT scans against the potential harm of radiation exposure. Due to a decreasing probability of relapse with the passage of time and a lack of proven benefit, CT scans in asymptomatic patients more than 2 years beyond the completion of treatment are rarely advisable.



American Society of Clinical Oncology

8

Avoid using PET or PET-CT scanning as part of routine follow-up care to monitor for a cancer recurrence in asymptomatic patients who have finished initial treatment to eliminate the cancer unless there is high-level evidence that such imaging will change the outcome.

- PET and PET-CT are used to diagnose, stage and monitor how well treatment is working. Available evidence from clinical studies suggests that using these tests to monitor for recurrence does not improve outcomes and therefore generally is not recommended for this purpose.
- False positive tests can lead to unnecessary and invasive procedures, overtreatment, unnecessary radiation exposure and incorrect diagnoses.
- Until high level evidence demonstrates that routine surveillance with PET or PET-CT scans helps prolong life or promote well-being after treatment for a specific type of cancer, this practice should not be done.



"Limit surveillance computed tomography (CT) or PET-CT in patients who have attained remission following curative-intent treatment for Hodgkin Lymphoma or aggressive non-Hodgkin lymphoma unless there is high-level evidence that such imaging will change the outcome".

Thank you



An initiative of the ABIM Foundation