Deauville Criteria for end of therapy

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5 Point Scale /Deauville criteria

1. n
2. u
3. u
4. n
5. n

or

ne

Leukemia & Lymphoma, August 2009; 50(8): 1257–1260

informa
healthcare

REVIEW

Report on the First International Workshop on interim-PET scan in lymphoma

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(Received 8 May 2009; accepted 12 May 2009)

Deauville Criteria

Concern that MBP ≥2cm background < 2cm was too low a threshold

Take account of varying FDG uptake during tx

Graded method of assessment

Flexible suited for trial

JOURNAL OF CLINICAL ONCOLOGY SPECIAL ARTICLE

Role of Imaging in the Staging and Response Assessment of Lymphoma: Consensus of the International Conference on Malignant Lymphomas Imaging Working Group

Sally F. Barrington, N. George Mikhaeel, Lale Kostakoglu, Michel Meignan, Martin Hutchings, Stefan P. Müeller, Lawrence H. Schwartz, Emanuele Zucca, Richard I. Fisher, Judith Trotman, Otto S. Hoekstra, Rodney J. Hicks, Michael J. O'Doherty, Roland Hustinx, Alberto Biggi, and Bruce D. Cheson

JOURNAL OF CLINICAL ONCOLOGY SPECIAL ARTICLE

Recommendations for Initial Evaluation, Staging, and Response Assessment of Hodgkin and Non-Hodgkin Lymphoma: The Lugano Classification

Bruce D. Cheson, Richard I. Fisher, Sally F. Barrington, Franco Cavalli, Lawrence H. Schwartz, Emanuele Zucca, and T. Andrew Lister

Published online 11/08/14
DOI 10.1200/JCO.2013.53.5229
DOI 10.1200/JCO.2013.54.8800

Deauville criteria/5-PS for end tx

Good interobserver agreement

Score 3 in patients receiving standard treatment likely represents CMR

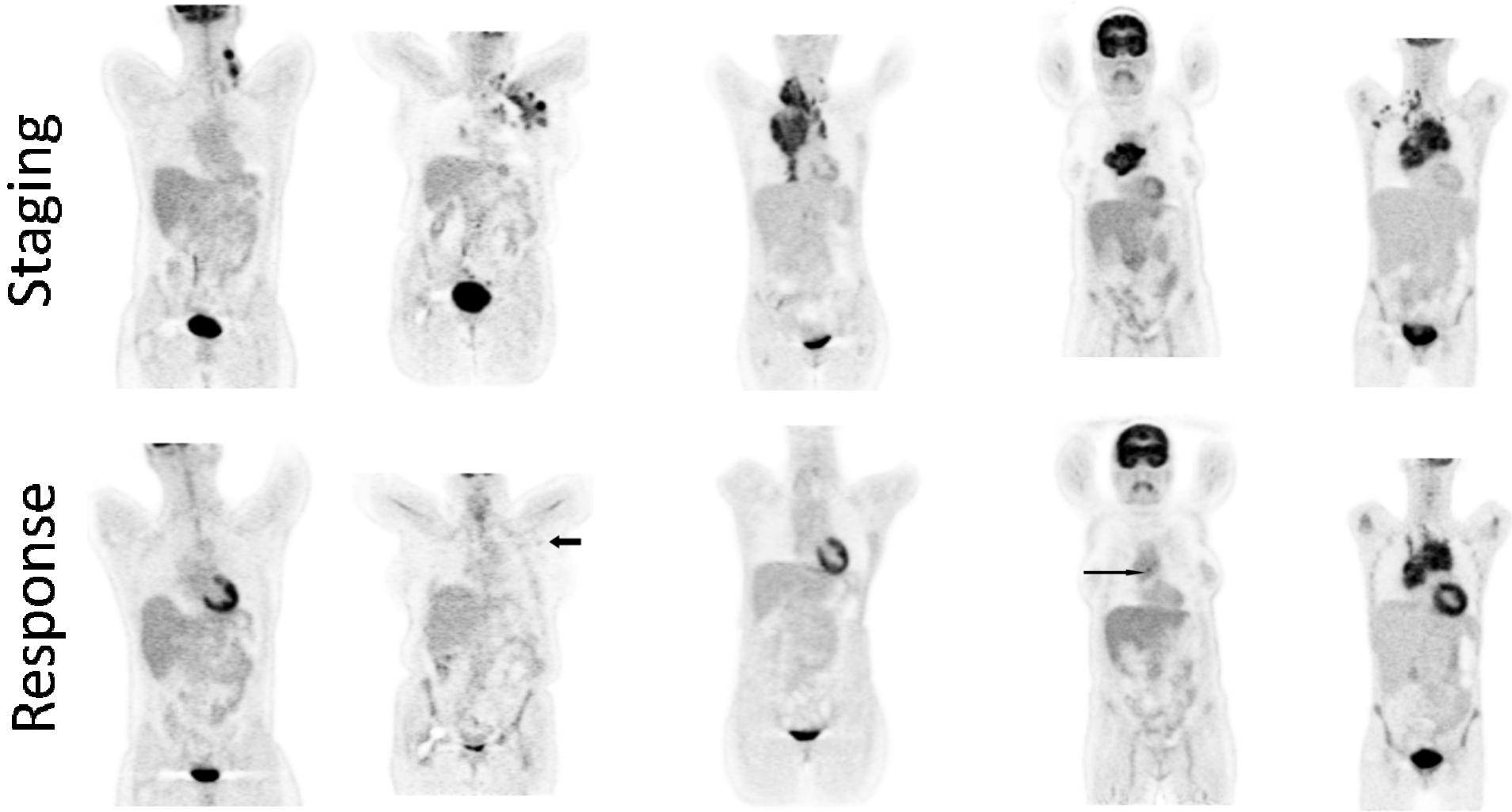
Especially with modern cameras

One method preferred for response assessment

(score 2 similar to IHP criteria)

Barrington 2010 EJNMMI; 37(10):1824-33, Le Roux Eur J Nucl Med Mol Imaging 2011; 38:1064-71, Biggi J Nucl Med 2013; 54:683-90, Dupuis J Clin Oncol 2012;30:4317-22, Itti et al EJNMMI 2013; 40:1312-20, Mamot 2013 Hem Oncol 31:100 (s1;abst 15), Nols 2014 Leuk Lymphoma Apr;55(4):773-80, Pregno 2012 Blood 119:2066-73, Tychyj-Pinel EJNNMI2014 Mar;41(3):408-15

Five Point Scale

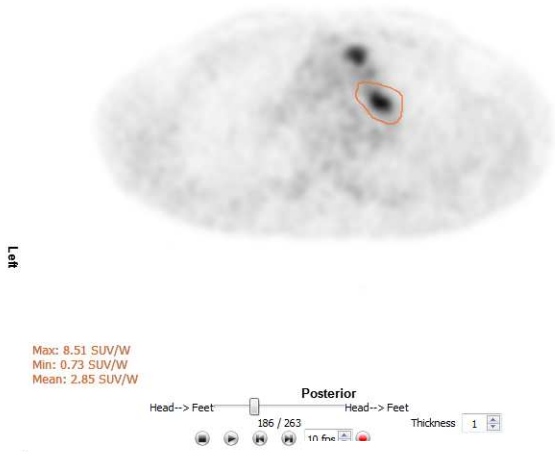


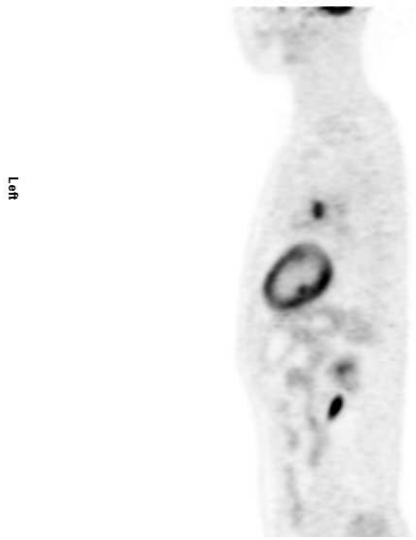
Score	1	2	3	4	5
	No uptake	FDG < MBP	FDG >MBP ≤ liver	FDG > liver	FDG >> liver

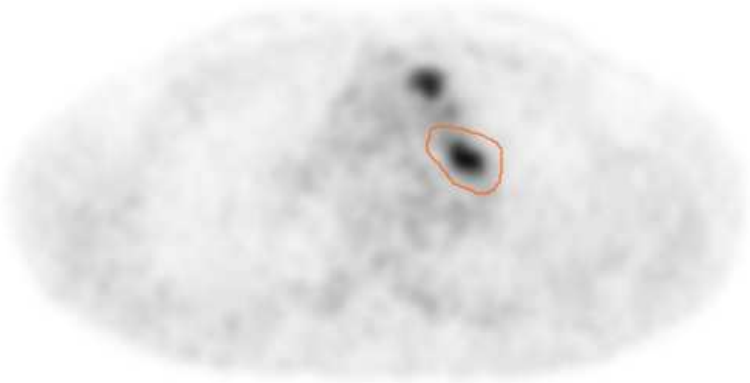
5 Point Scale (Deauville criteria)

1. no uptake
2. uptake ≤ mediastinum
3. uptake > mediastinum but ≤ liver
4. moderately increased uptake compared to liver
5. markedly increased uptake compared to liver and/or new lesions

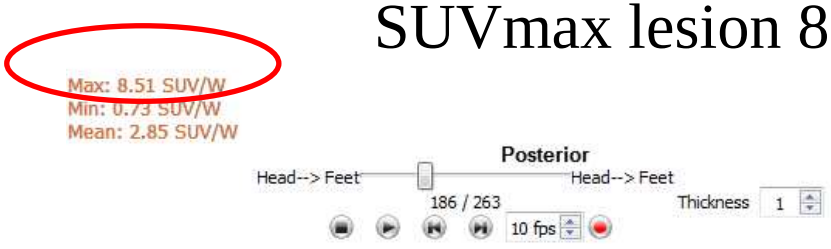
** markedly increased uptake is taken to be uptake > 2-3 times the SUV max in normal liver



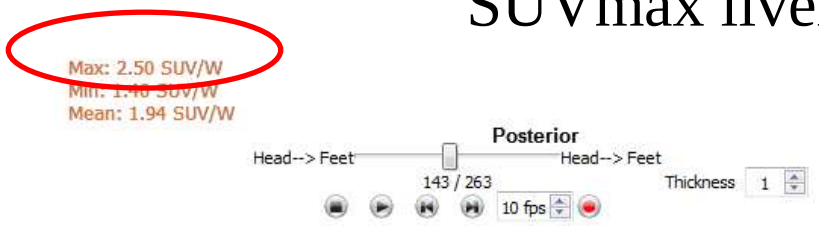




SUVmax lesion 8.51



SUVmax liver 2.50



Score 5

High physiological FDG uptake

can occur in some sites…

e.g. Waldeyers ring , gut, bone marrow after chemotherapy or GCSF treatment with ‘physiologic’ uptake > normal liver

In this case, CMR may be inferred if uptake at sites of initial involvement is no greater than surrounding normal tissue

Barrington et al JCO 2014 in press

CATEGORY	PET – CT based metabolic response
CMR	Score 1,2,3* in nodal or extranodal sites with or without a residual mass using 5-PS
PMR	Score 4 or 5, with reduced uptake compared with baseline and residual mass(es) of any size. *At interim* , these findings suggest responding disease *At end of treatment* these findings indicate residual disease Bone marrow: Residual marrow uptake > normal marrow but reduced compared with baseline (diffuse changes from chemotherapy allowed). If there are persistent focal changes in marrow with a nodal response, consideration should be given to MRI, biopsy or interval scan.
NMR	Score 4 or 5 with no significant change in uptake from baseline *At interim or end of treatment*
PMD	Score 4 or 5 with an increase in uptake from baseline and /or New FDG-avid foci consistent with lymphoma *At interim or end of treatment*

* **Score 3 in many patients indicates a good prognosis with standard treatment. However in trials involving PET where de-escalation is investigated, it may be preferable to consider score 3 as inadequate response to avoid under-treatment** Cheson et al JCO 2014 on line

Response according to 5-PS

Score 1, 2 is Complete Metabolic Response (CMR)

Score 3 is probably also CMR with standard treatment

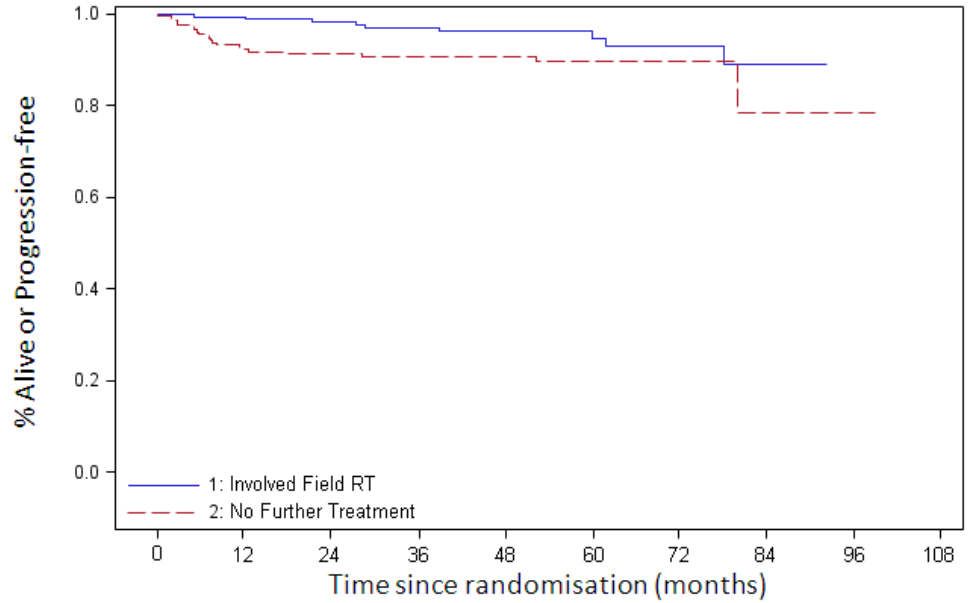
But in response-adapted trials exploring de-escalation, score 3 may be deemed inadequate response to avoid under-treatment

Interpretation of score 3 depends on timing of assessment, clinical context & treatment.

Barrington et al JCO 2014 on line

Early stage HL

RAPID : PFS in PET -ve population (per protocol analysis)



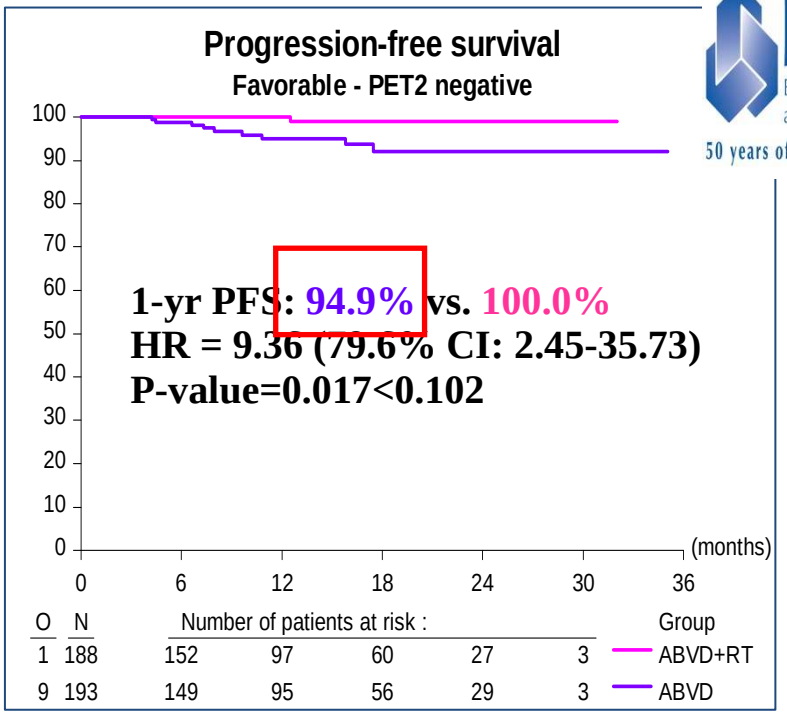
Number at risk:

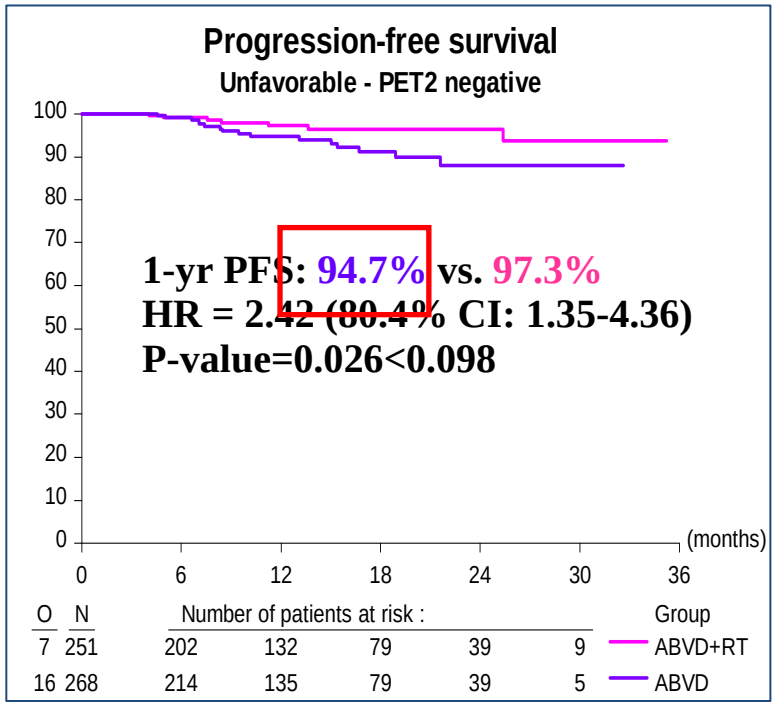
IFRT	183	179	162	129	98	65	38	17	0	0
NFT	209	188	163	132	100	60	18	4	2	0

3 year PFS 97% vs 90.7%

HR 2.39 in favour of IFRT, p=0.03

Radford et al, Blood 2012; 120: a547





Raemaekers J et al JCO 2014;32: 1188-94

HL advanced stage HD15

n =739 PR ≥ 2.5cm

- PET –ve 548 (74%)
- PET +ve 191

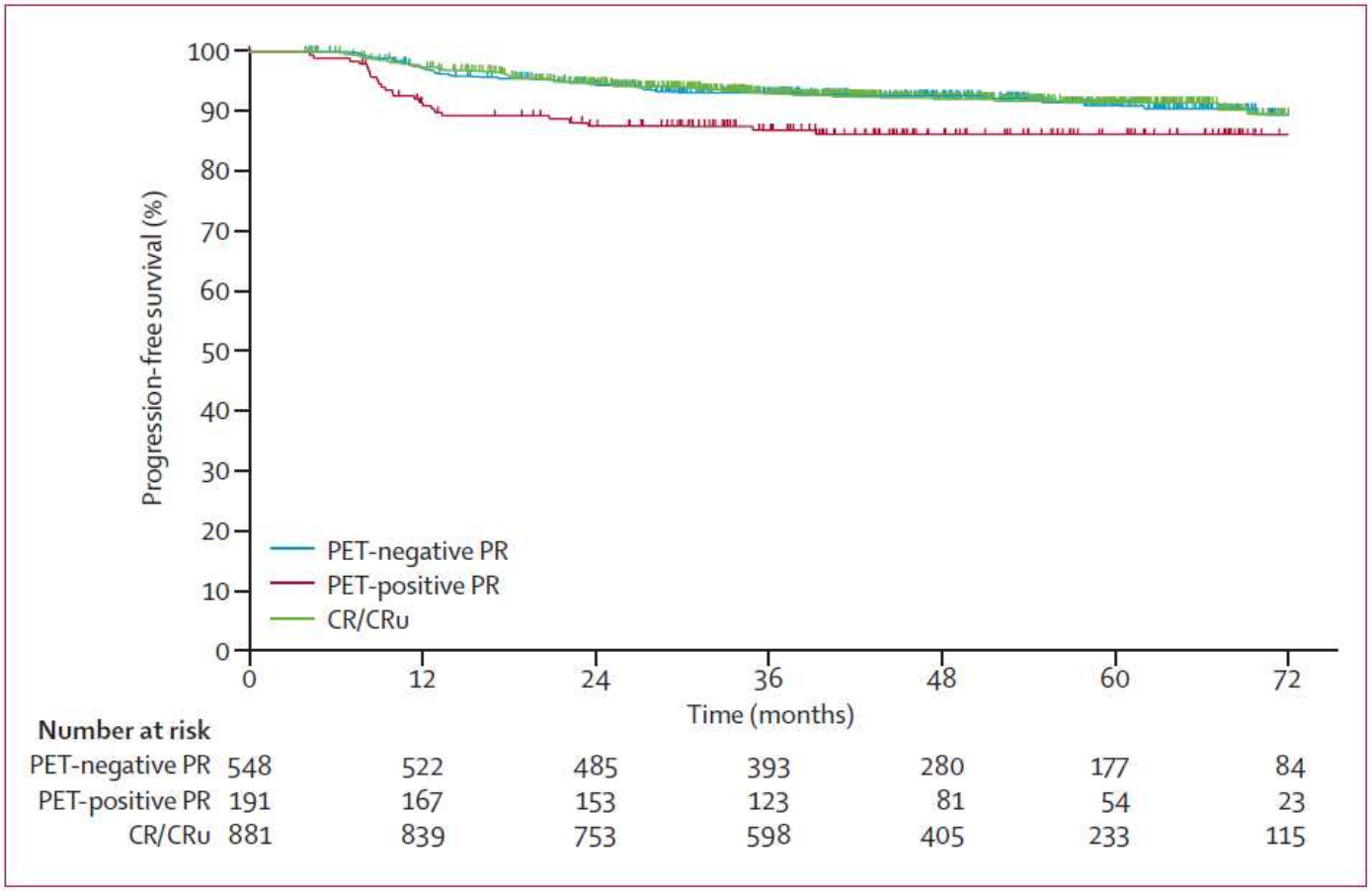


Figure 3: **Progression free survival for PET study objective**
PR=partial remission at the end of chemotherapy. CR/Cru=complete remission without or with residual abnormalities at the end of chemotherapy.

11% had RT

Originally published by the Lancet
[Engert A et al 2012 379(9828),May12 pp1791-9]

bjh guideline

Guidelines for the first line management of classical Hodgkin lymphoma

George A. Follows,[1] Kirit M. Ardeshna,[2] Sally F. Barrington,[3] Dominic J. Culligan,[4] Peter J. Hoskin,[5] David Linch,[2,6] Shalal Sadullah,[7] Michael V. Williams[8] and Jennifer Z. Wimperis[9] for the British Committee for Standards in Haematology

Recommendations:

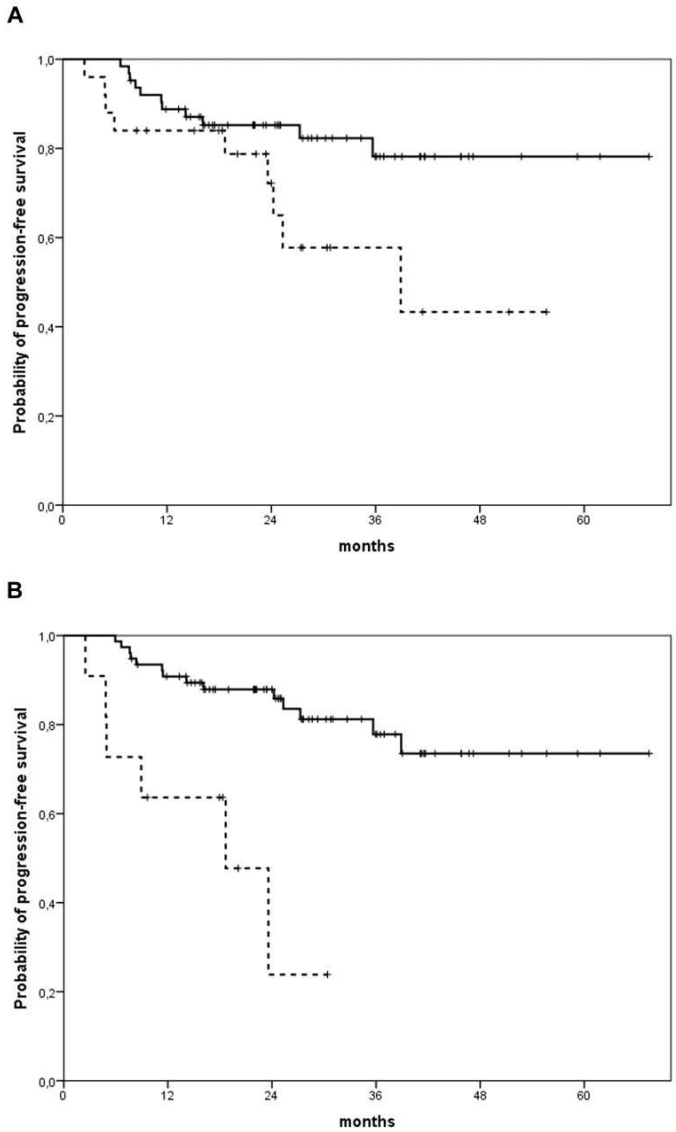
The decision to omit RT from the management of IA/IIA non-bulky patients should involve discussion with a radiation oncologist (1B) and patients choosing to omit RT need to be aware of the balance of risks between RT and additional cycles of chemotherapy. (1B)

Patients treated with escalated BEACOPP who achieve an end-of-treatment PET-negative remission do not require consolidation RT to residual tissue (1A)

'It is recommended therefore that ***score 1 or 2*** *is used to define a complete metabolic response (CMR) if omission of 'standard' radiotherapy treatment is being considered in discussion with patients.'*

DLBCL

PFS according to response at I-PET and F-PET.



Interim

End

PPV 82 %
NPV 100 %
Using **Score 1,2 3**
to define CMR
At **END**

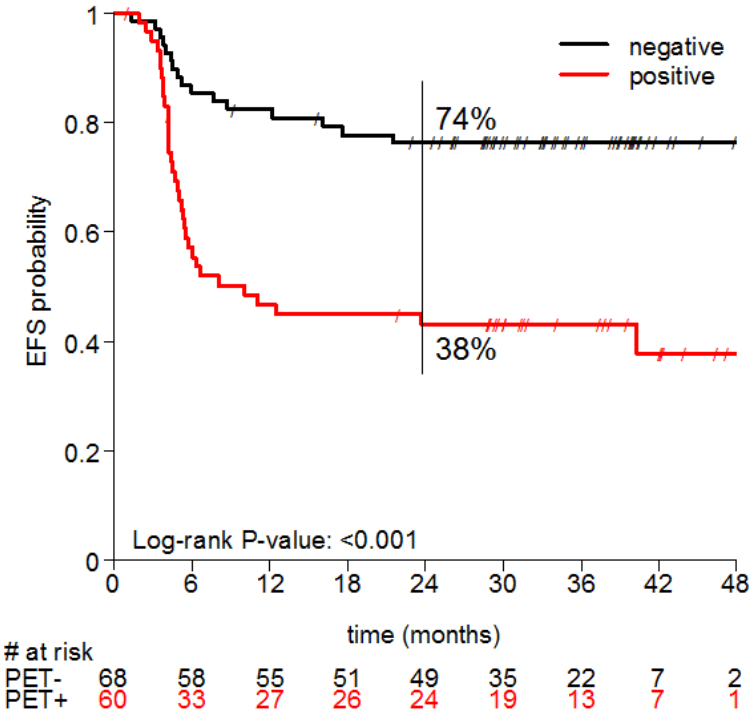
Pregno P et al. Blood 2012;119:2066-2073

Prospective evaluation of the predictive value of PET in 141 patients with DLBCL under R-CHOP-14 (SAKK 38/07)

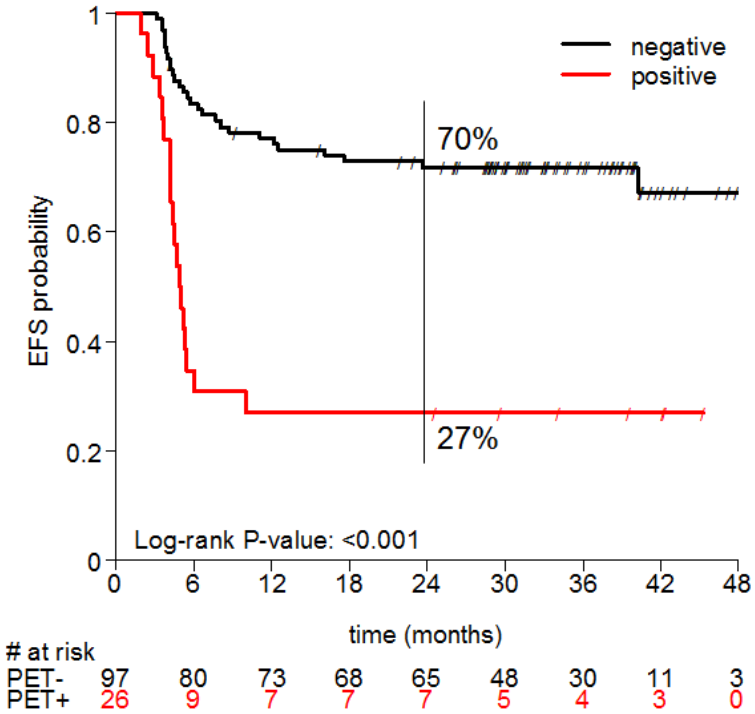
Score 1,2 3 used to define CMR

SAKK

Interim PET, central review, 5-point scale

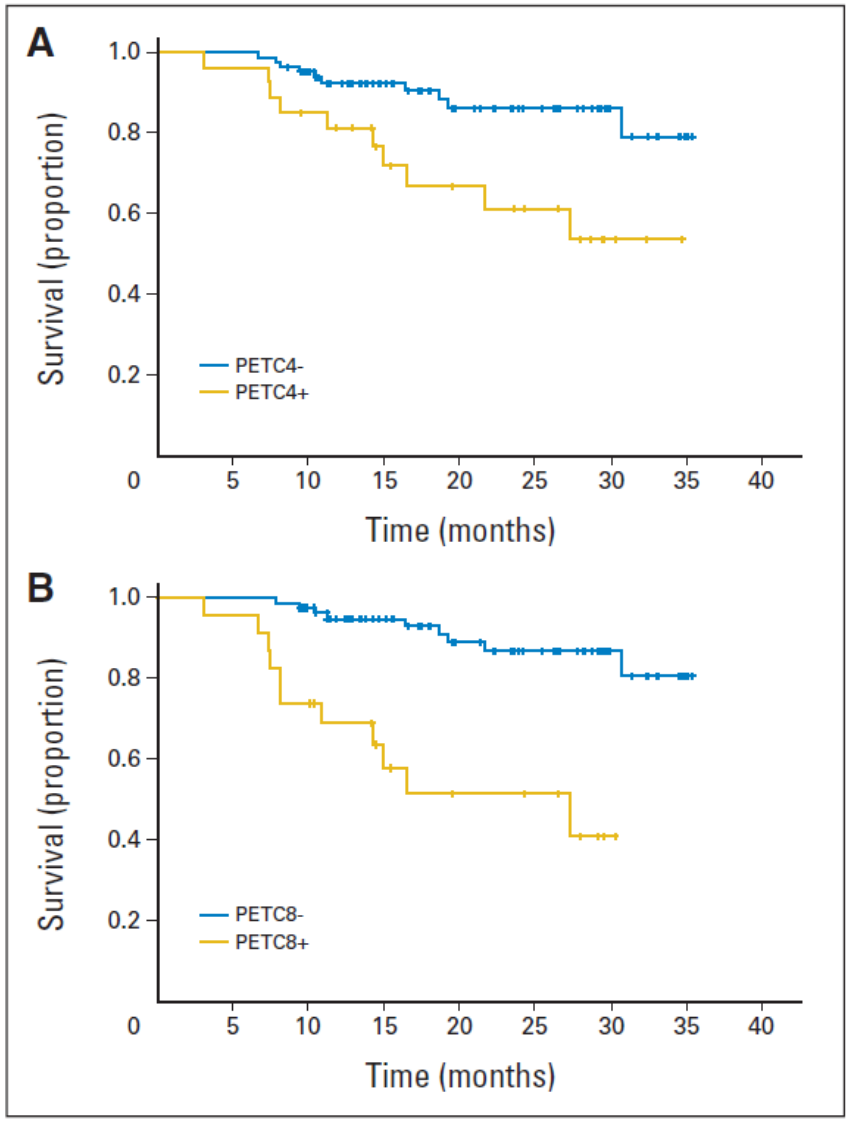


End of treatment, central review, 5-point scale, liver cut-point



C. Mamot, 12-ICML, Hematol Oncol 2013. 31(suppl 1):100-1. Abs 15

Follicular Lymphoma



Interim

End

Score 1,2 3 best to define CMR

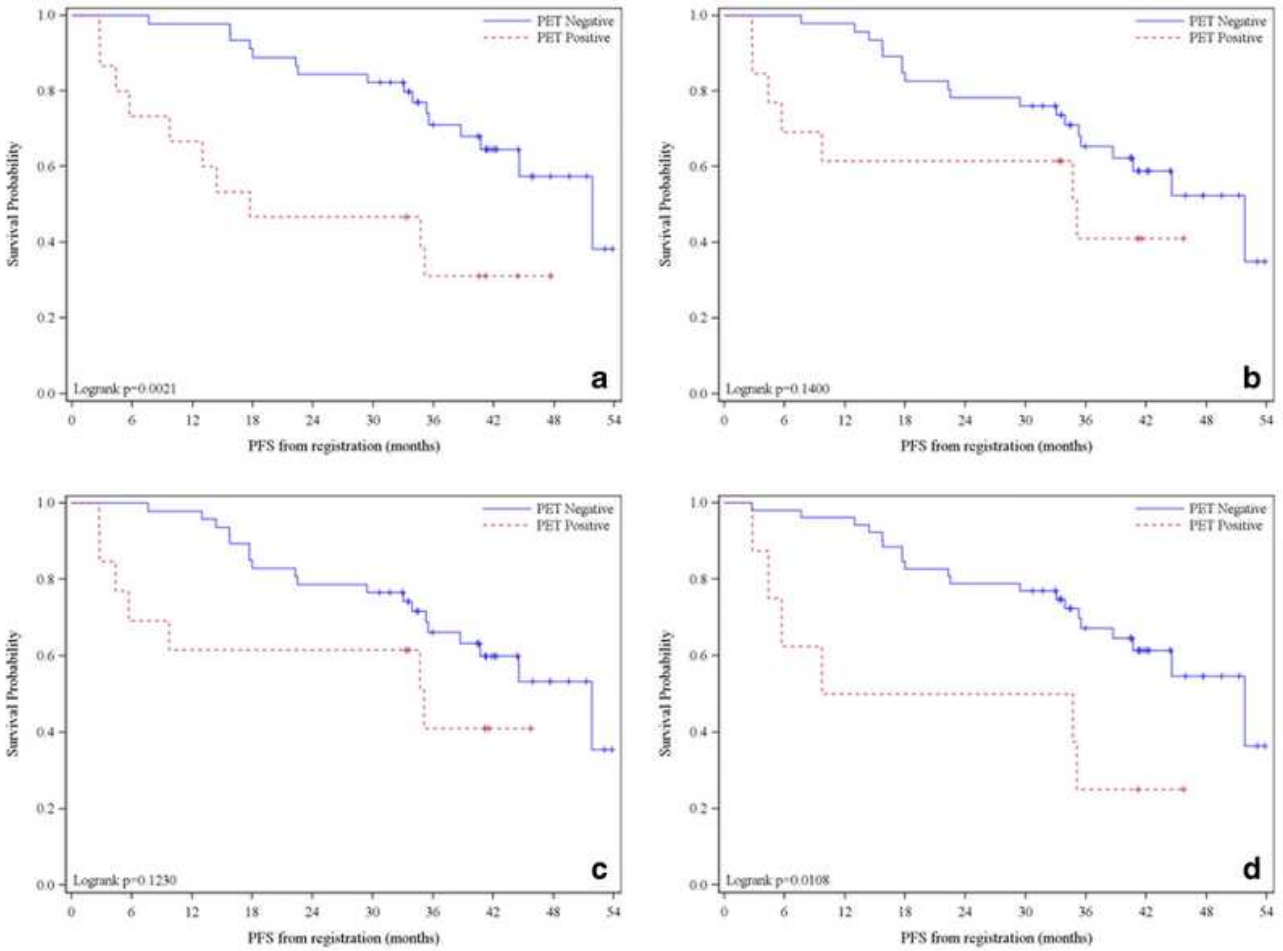
JOURNAL OF CLINICAL ONCOLOGY

Dupuis J et al. JCO 2012; 10;30(35):4317-22

Comparison of criteria for end tx in FL

Local review

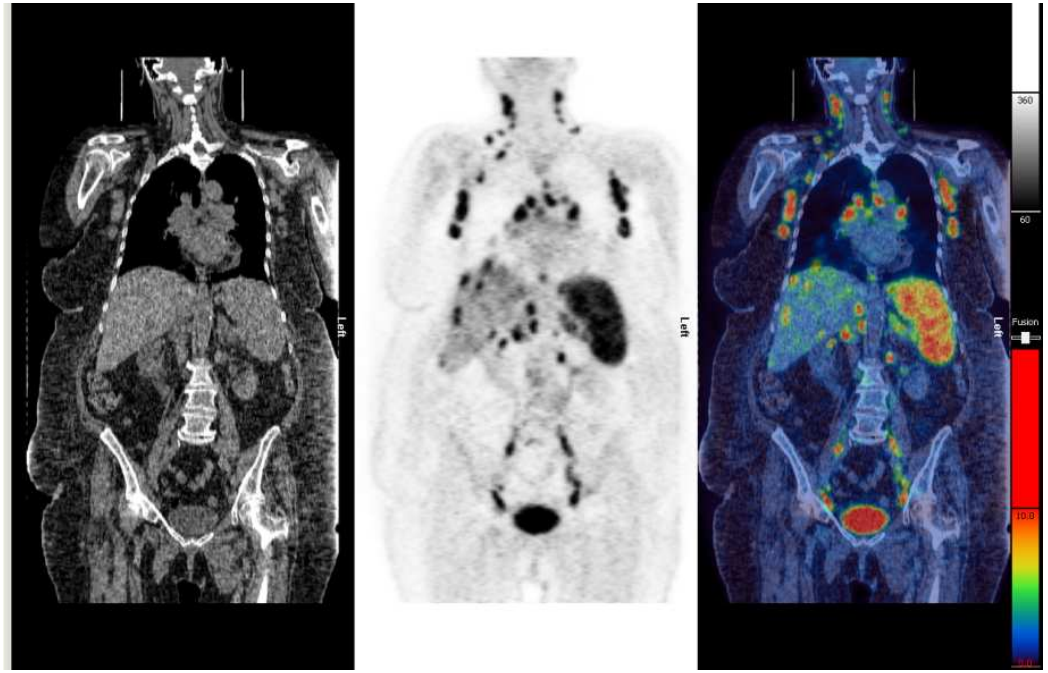
IHP



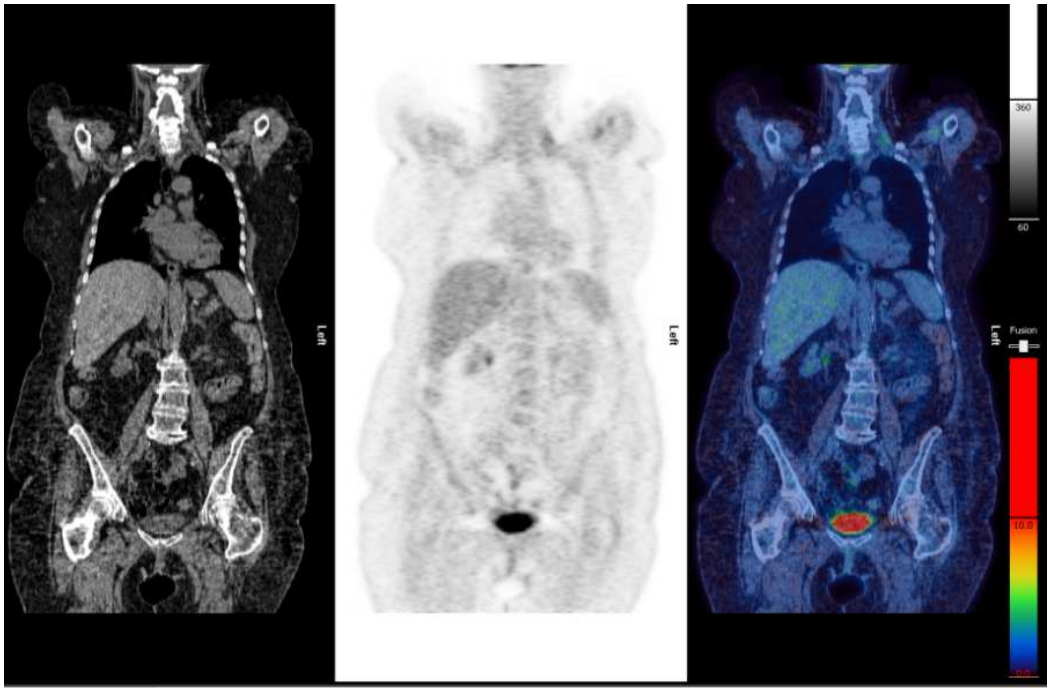
MBP (CMR score 1, 2) Liver (CMR score 1, 2, 3)

Tychyj-Pinel C EJNMMI 2014 Mar;41(3):408-15

Baseline



Response



Score 1

CMR

Response according to 5-PS

Score 4, 5 with reduced uptake from baseline is partial metabolic response (PMR)

-At interim this suggests responding disease

-At end of treatment this suggests residual metabolic disease

Barrington et al; Cheson et al JCO 2014 on line

Baseline

Response End

Score 5

PMR

Response according to 5-PS

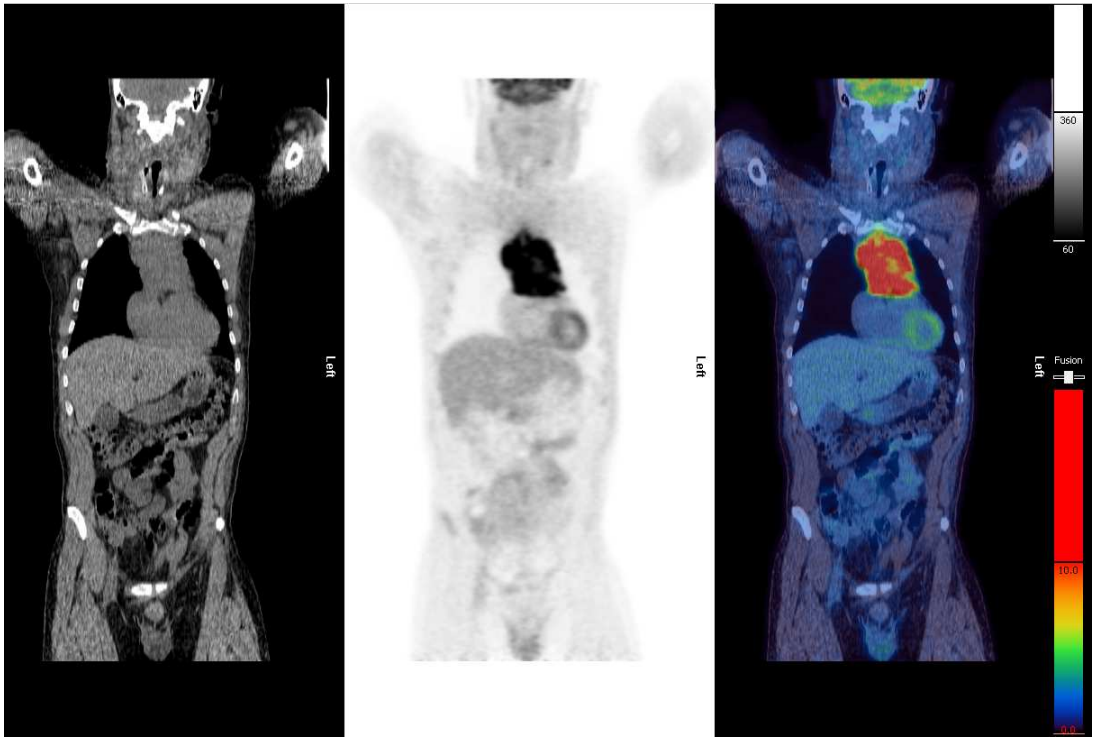
Score 4, 5 with no change in uptake from baseline means no metabolic response (NMR)

Score 4, 5 with an increase in uptake from baseline &/or new lesions is progressive metabolic disease (PMD)

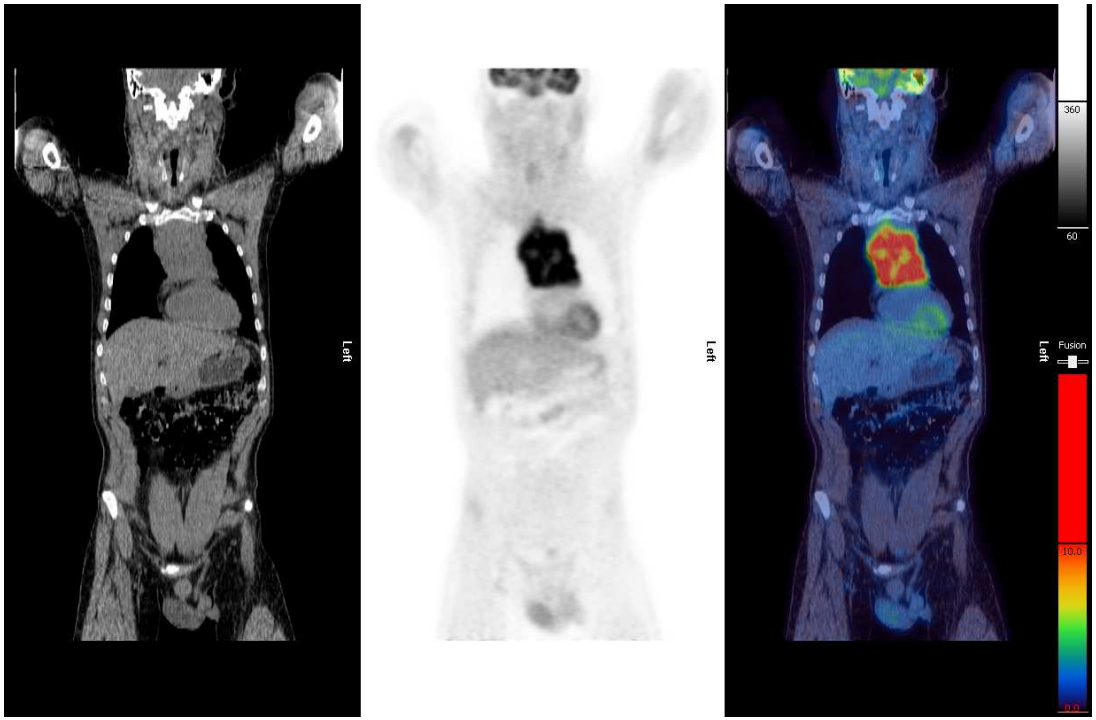
-At interim and end of treatment NMR and PMD indicates treatment failure

Barrington et al; Cheson et al JCO 2014 on line

Baseline



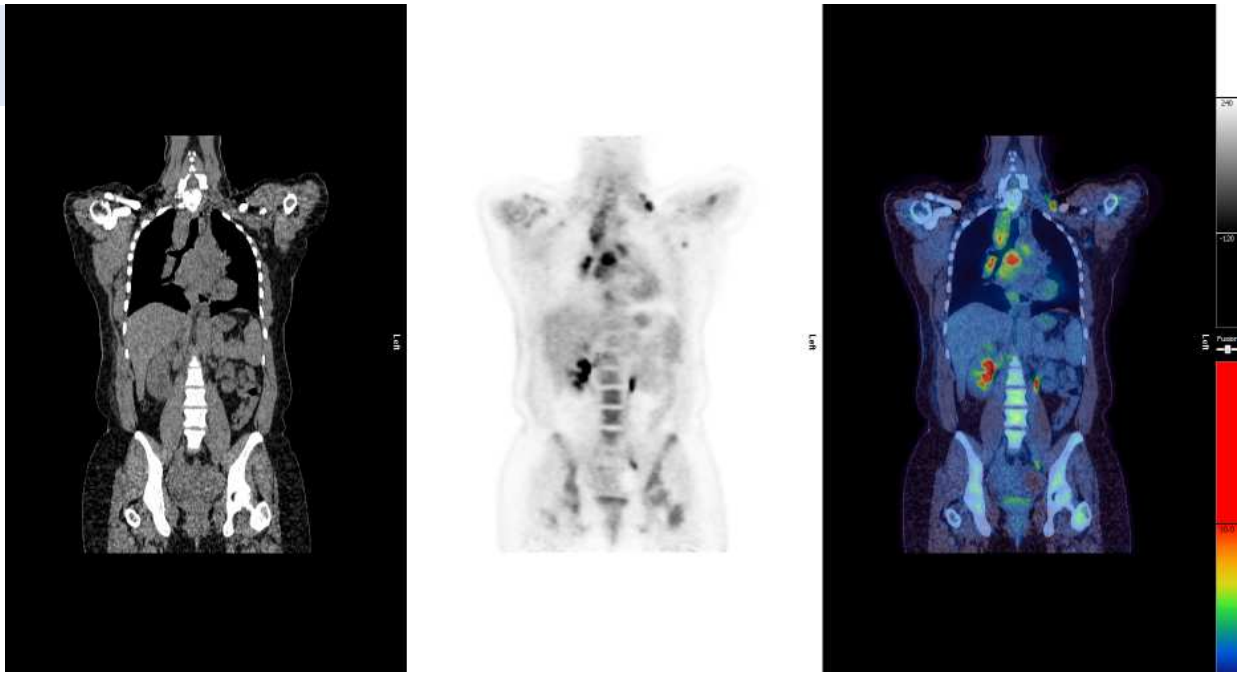
Response



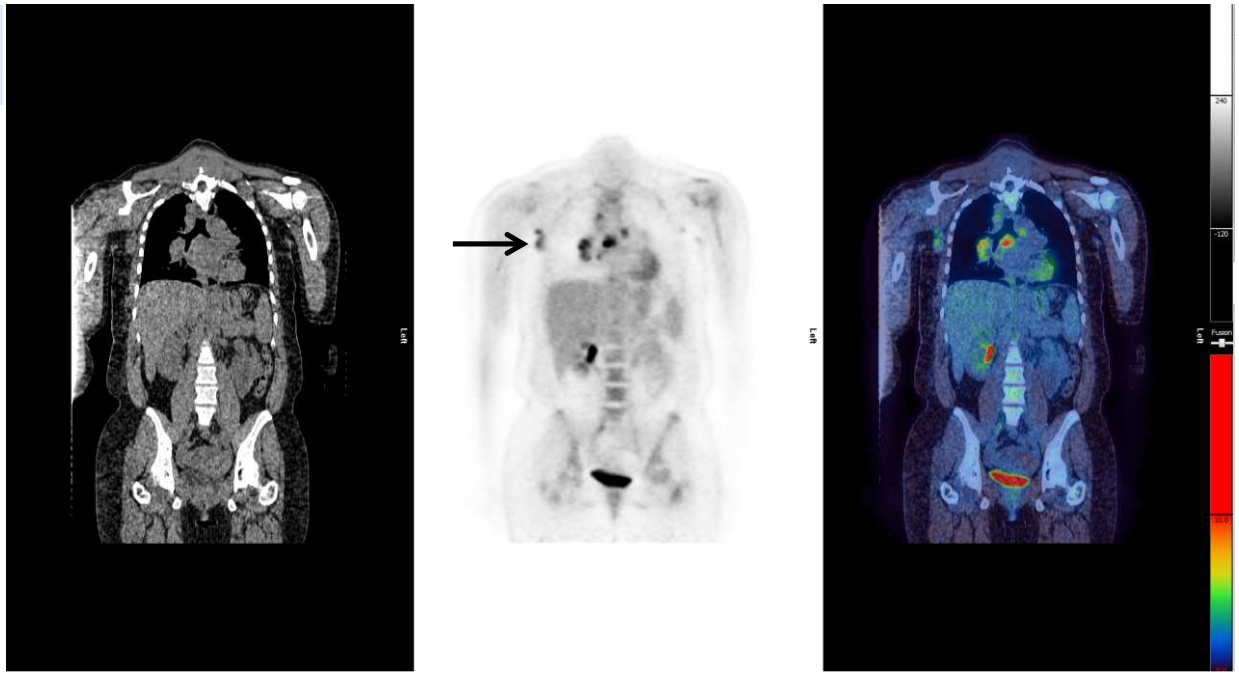
Score 5

NMR

Baseline

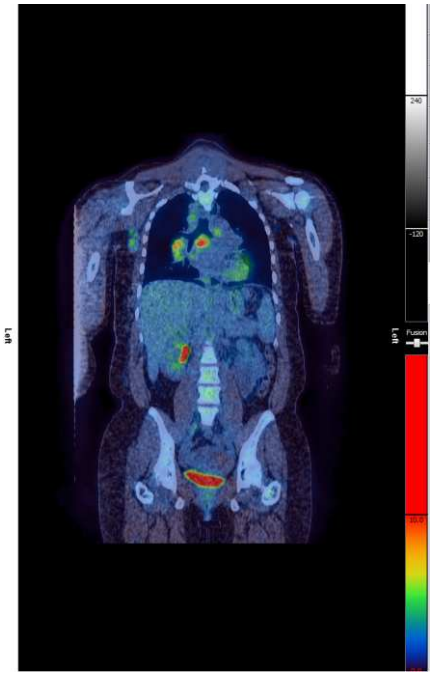


Post 2



PMD ?

Interim Post 2



Post 3

PMD confirmed

Residual masses

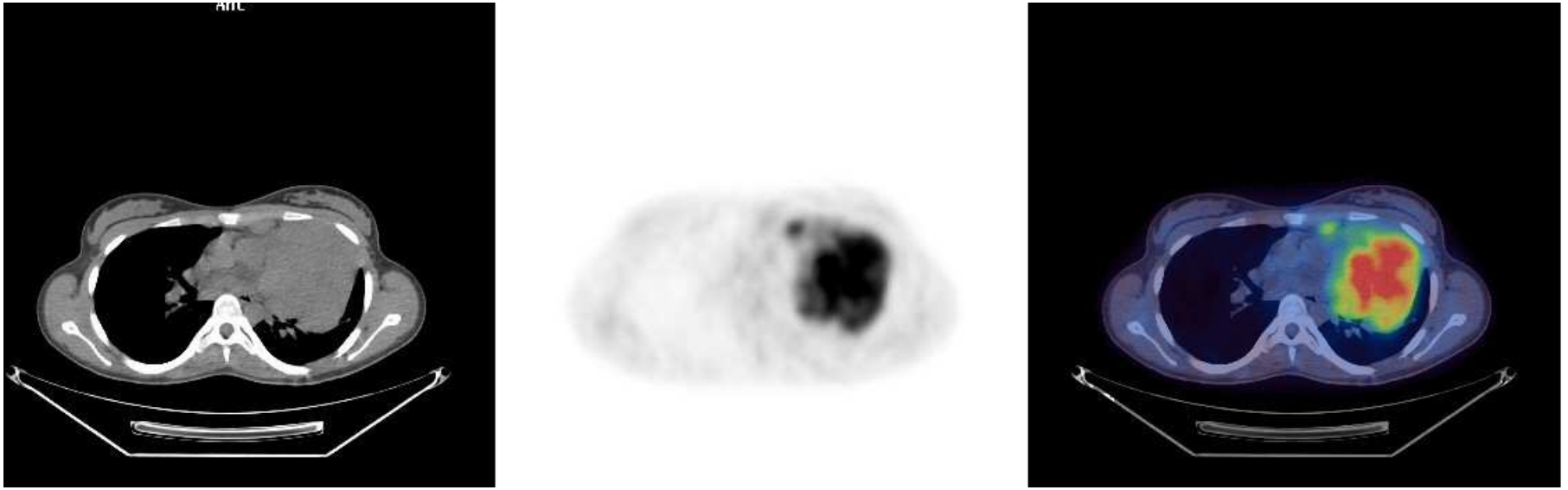
Biopsy of residual metabolically active tissue is recommended if salvage treatment is considered

or an interval scan where clinical likelihood of disease is low to decide on treatment (or not)

Barrington et al; Cheson et al JCO 2014 on line

Guiding a biopsy

Baseline



End PET

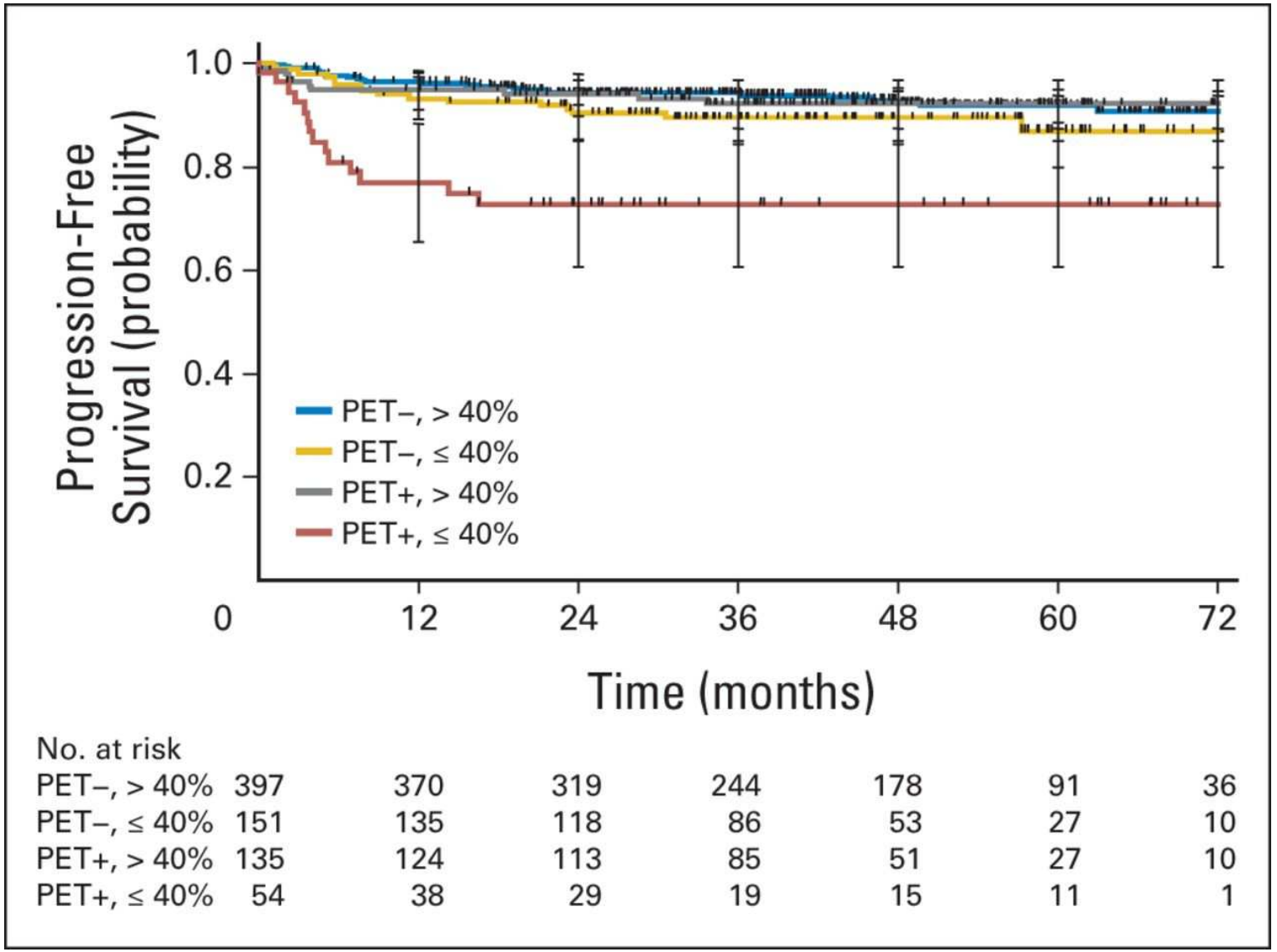
Residual masses

Residual size mass and location should be recorded in PET-CT reports where possible

as significance of the size of masses is unclear but may be complementary to metabolic information and data should be collected prospectively in clinical trials

Barrington et al; Cheson et al JCO 2014 on line

Progression-free survival in positron emission tomography (PET) –positive and PET-negative patients and 40% reduction of the largest tumor diameter.

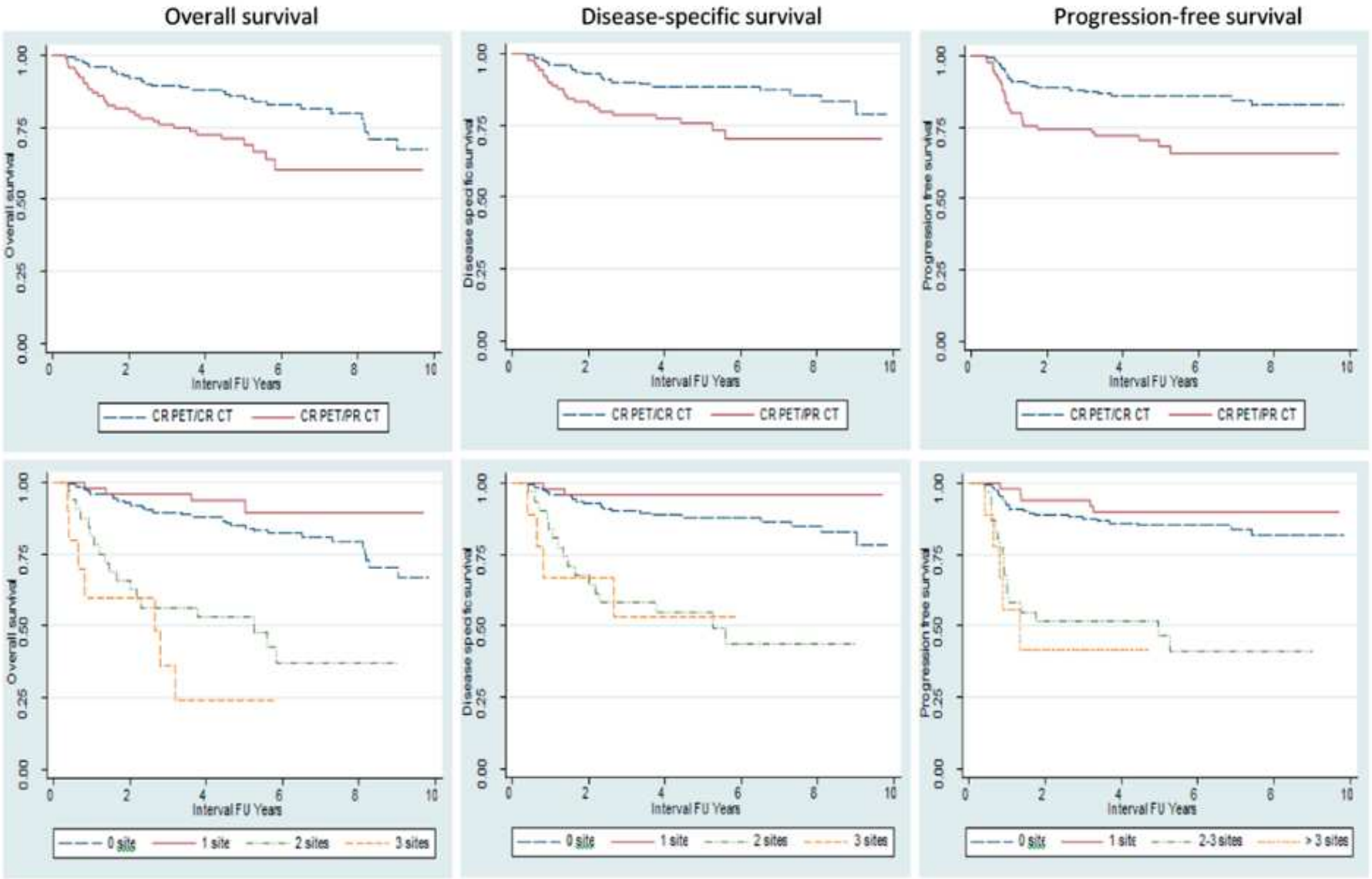


No. at risk

PET–, > 40%	397	370	319	244	178	91	36
PET–, ≤ 40%	151	135	118	86	53	27	10
PET+, > 40%	135	124	113	85	51	27	10
PET+, ≤ 40%	54	38	29	19	15	11	1

Kobe C et al. JCO 2014;32:1776-1781

Influence of residual mass ?



Dabaja et al Leuk Lymphoma 2013

Timing of PET-CT scans

Should be:

as long as possible after the last chemotherapy administration for interim scans

6-8 weeks post chemotherapy at end of treatment ideally (but a minimum of 3 weeks)

≥ 3 months after radiotherapy

Barrington et al JCO 2014 on line

Summary

- DC are recommended for response assessment in 2014 ICML guidelines
- Can be used to assign metabolic response categories
- Score 3 likely represents CMR in patients receiving standard therapy BUT score 1,2 may be preferred to define CMR using de-escalation strategies to avoid undertreatment
- End of treatment residual or new metabolic disease requires biopsy confirmation before salvage therapy where feasible or an interval scan if clinical index of residual disease is low

With special thanks to co-authors

N George Mikhaeel
Lale Kostakoglu
Michel Meignan
Martin Hutchings
Stefan Müeller
Lawrence Schwartz
Emanuele Zucca
Richard Fisher
Judith Trotman
Otto Hoekstra

Rodney Hicks
Michael O'Doherty
Roland Hustinx
Alberto Biggi
Franco Cavalli
Andrew Lister
Bruce Cheson

And all attendees at Deauville & Menton workshops 2009-current