

## RECOMMENDATIONS: RESPONSE ASSESSMENT - QUANTITATIVE

1. Standardisation of PET methods is mandatory for the use of quantitative approaches (*category 1*)
2. Data are emerging to suggest that quantitative measures could be used to improve on visual analysis for response assessment in DLBCL but this requires further validation in clinical trials (*category 2*).
3. The  $\Delta\text{SUV}_{\text{max}}$  is the only quantitative measure with published data to indicate its possible utility in response assessment but changes in tumour volumes should also be explored (*category 3*).

**Why a quantitative assessment  
of the response with  $\Delta$ SUV?**

**Difficulties in PET/CT Interpretation  
Criteria**

# Black on Gray contrast



Mark Rothko, Black on Gray 1969

# PET + if residual uptake (black) higher than a fixed reference background (gray)

Nearby background (NB)

**SUVmax = 1**

Mediastinal blood pool (MBP)

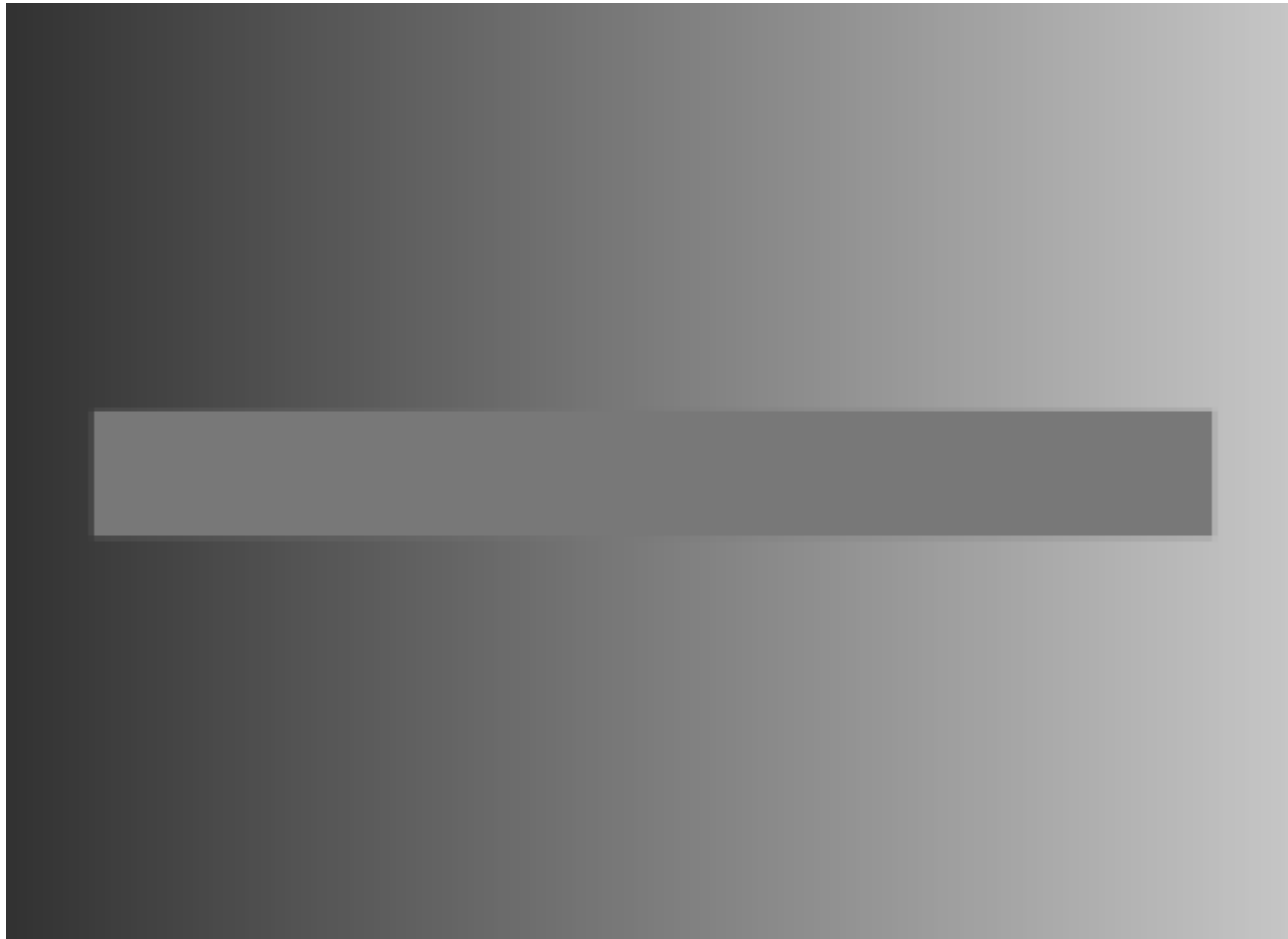
**SUVmax = 1.6-1.8**

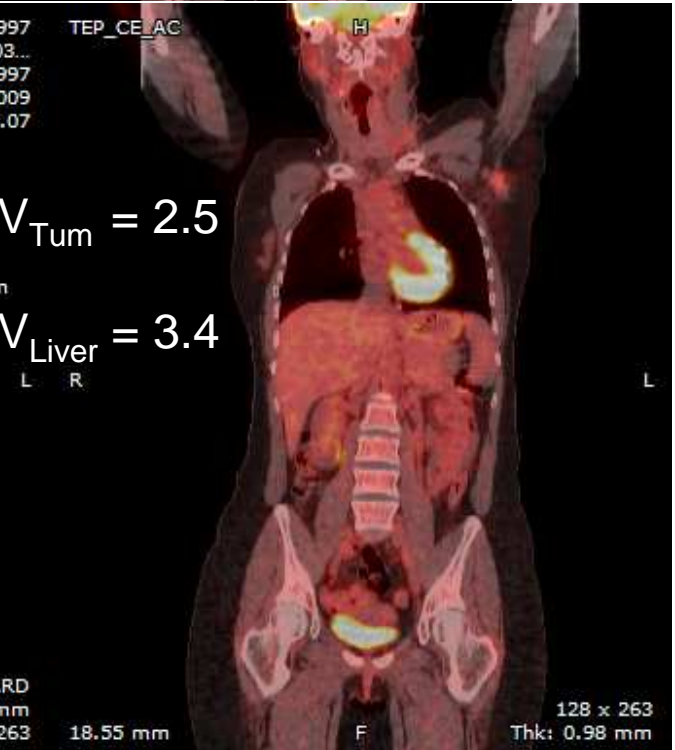
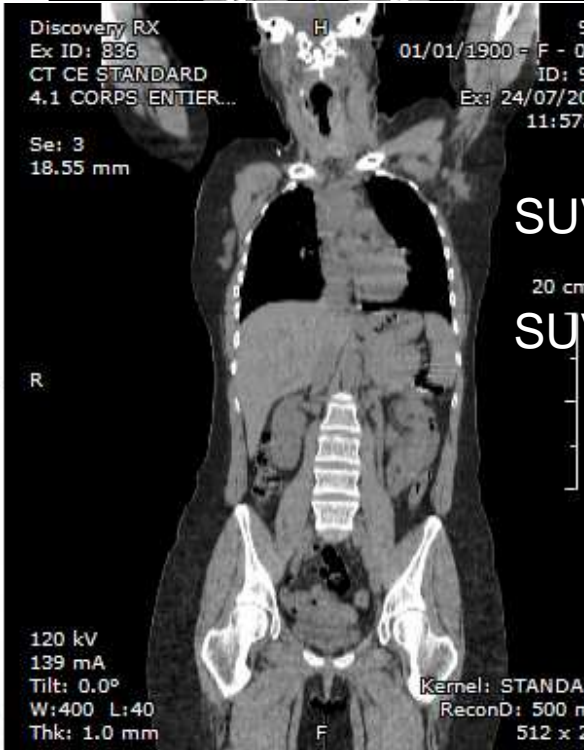
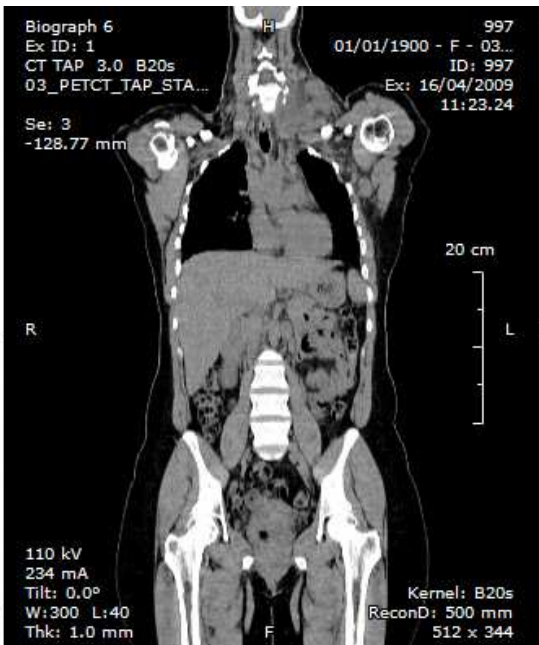
Liver (L)

**SUVmax = 2.5**

**2007 IHP criteria (End treatment): 2 reference BKGs depending on the size of the residual lesion (NB < 2cm, MBP ≥ 2cm)**







$SUV_{Tum} = 2.5$

$SUV_{Liver} = 3.4$

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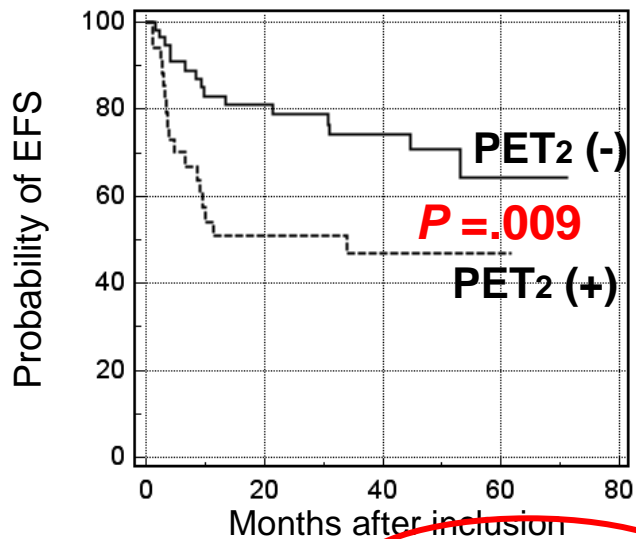


Michel Meignan



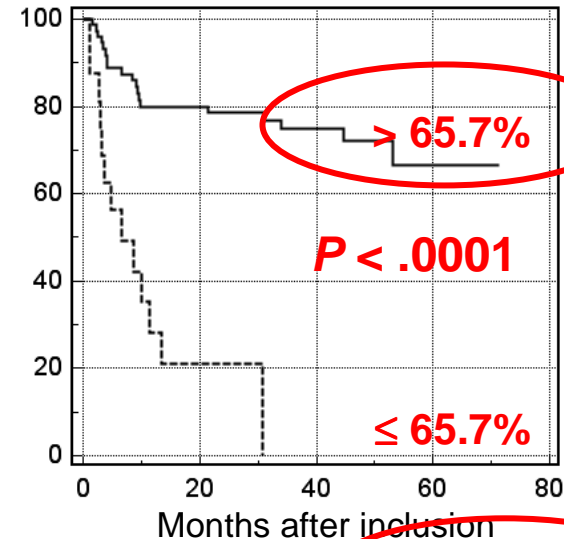
# Quantitative analysis( $\Delta$ SUV) vs. Visual 2 cycles, n=92, DLBCL (51%R-Chemo)

Visual analysis  
(Créteil, MRU)



NPV=74%, PPV=50%

Quantitative analysis  
(% reduction SUV<sub>max</sub>)



NPV=73.6%, PPV=84.6%

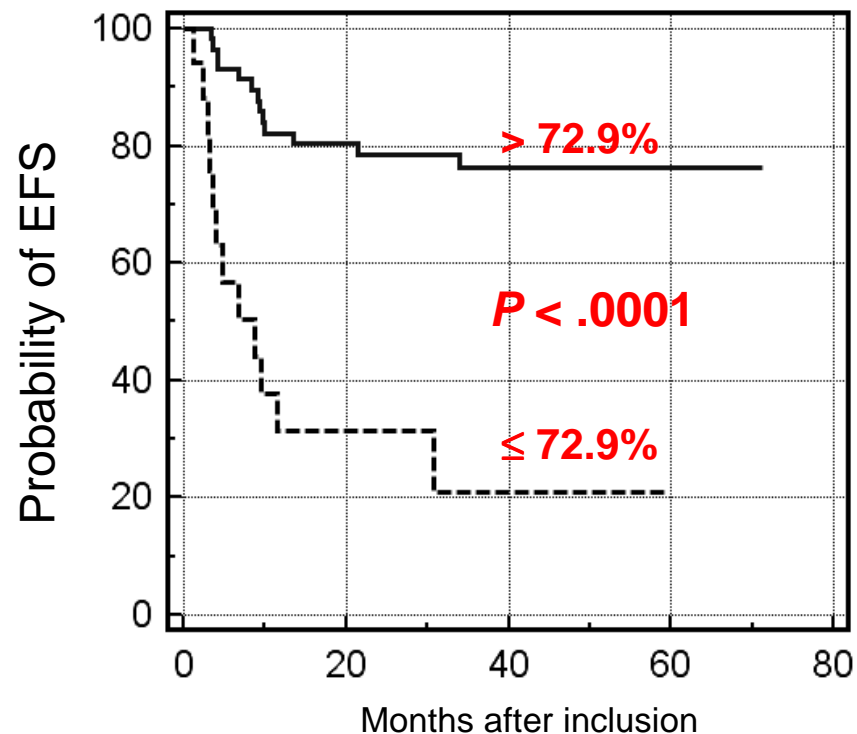
→Objective



# Quantitative analysis vs. Visual

## 4 cycles, n=80, DLBCL (50%R-chemo)

**Quantitative analysis**  
(% reduction SUV<sub>max</sub>)



**NPV=79.4%, PPV=70.6%**

*Itti et al. J Nucl Med 2009;50:527-33*

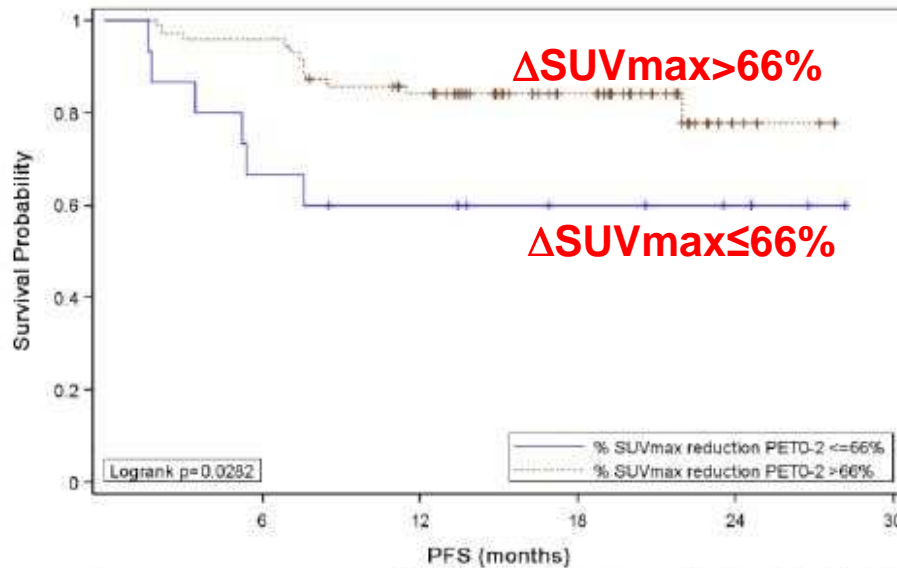
## LNH 2007-3B trial

# PET driven strategy (2/4 cycles)

85 patients, DLBCL, aalPI 2-3, randomized R-ACVBP/R-CHOP14  
Interim analysis of LNH073B trial, PET2/4 driven strategy, MFU=19m

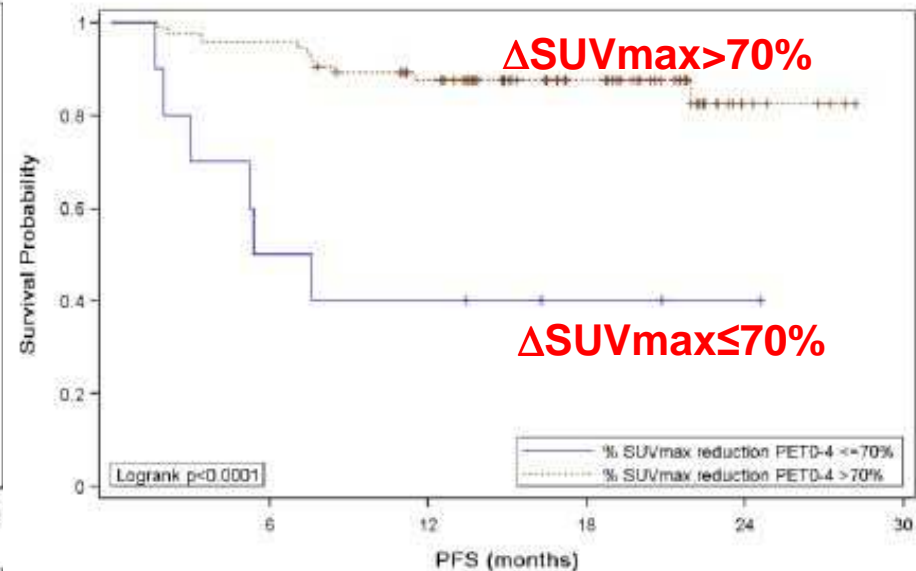
### PET2

SUVmax reduction (>66% versus ≤ 66%)



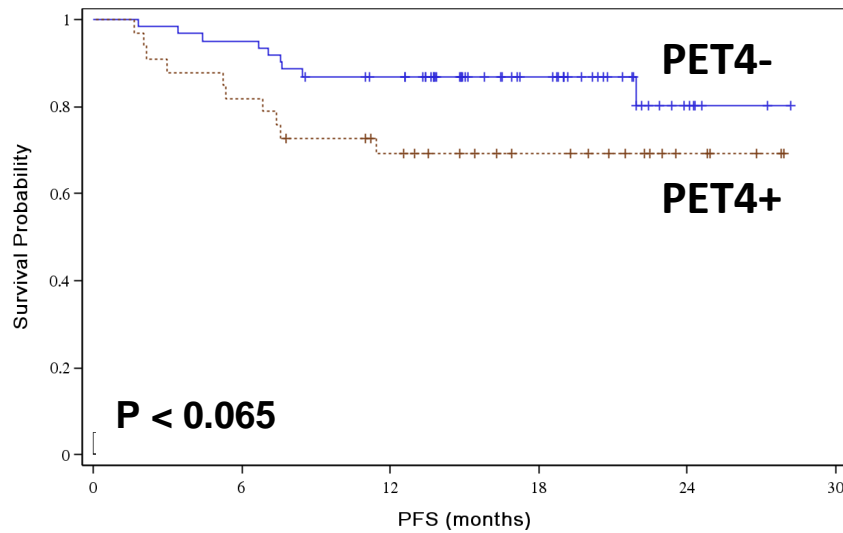
### PET4

SUVmax reduction (>70% versus ≤ 70%)

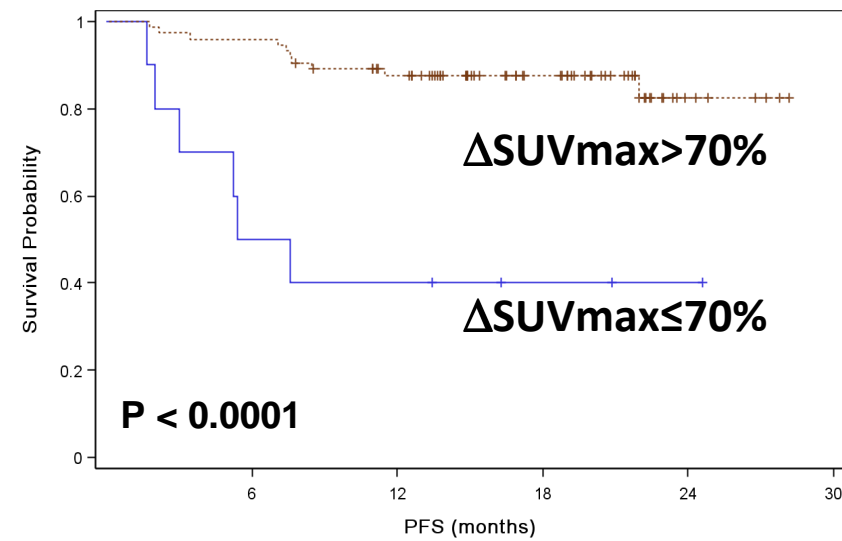


# 5PS vs $\Delta$ SUVmax

Visual Analysis (5PS:  $<4$  vs  $\geq 4$ )



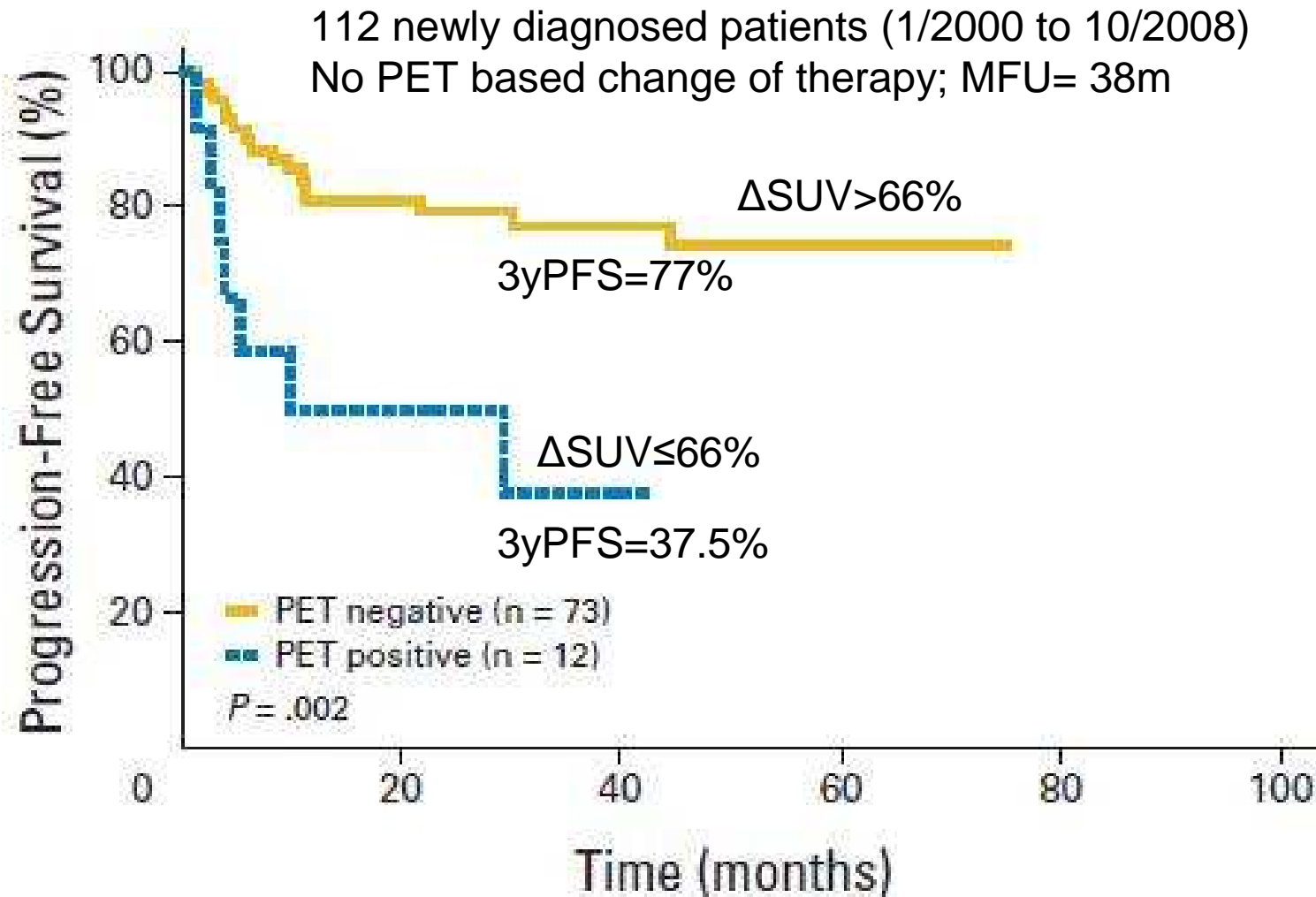
$\Delta$ SUVmax PET0-4



## PFS according to PET4 results

*Casasnovas O , Meignan M et al , Blood 2011;118:37-43*

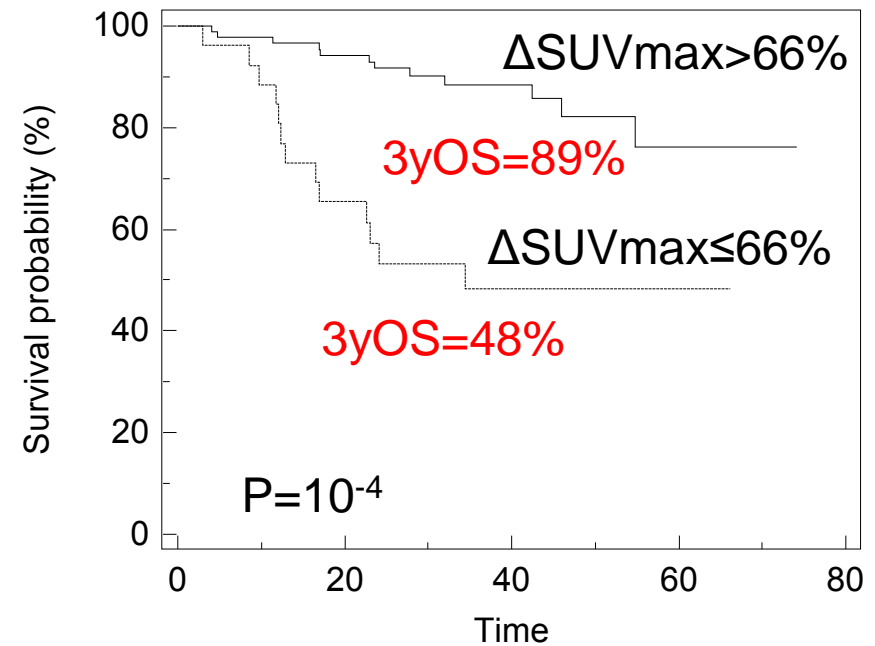
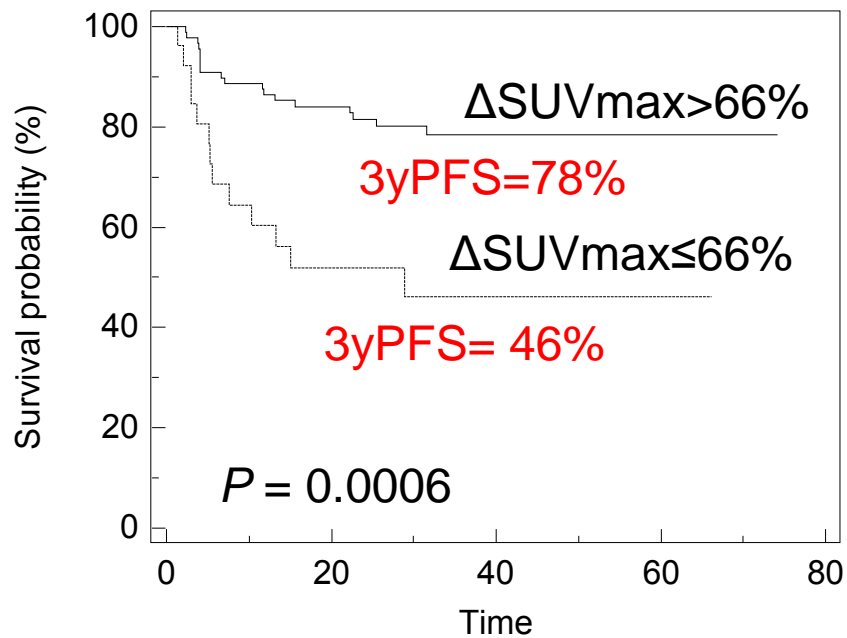
# PET2 in DLBCL patients treated with Anthracycline based chemotherapy+ Rituximab



*Safar et al JCO, 2012;30:184-190*

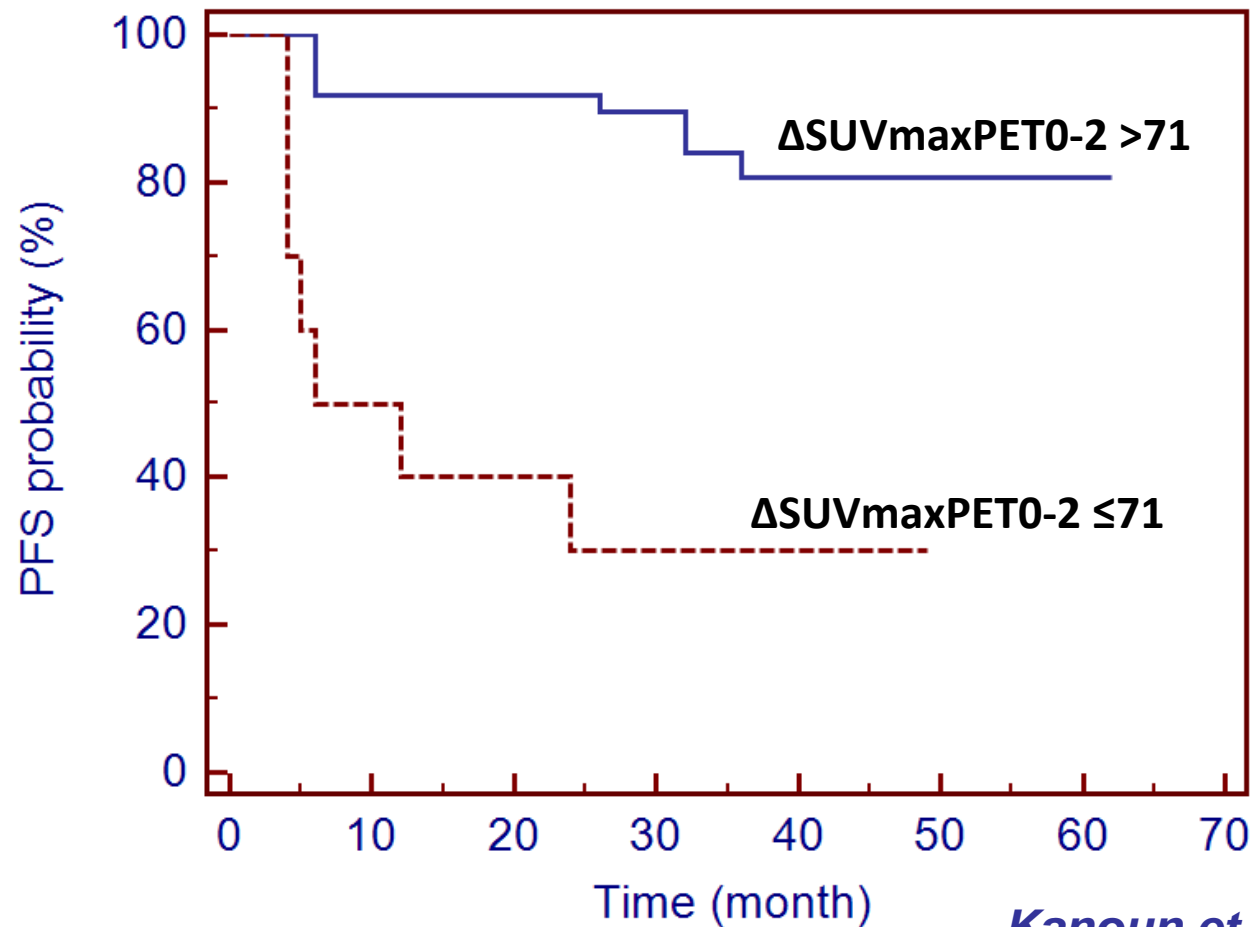
# DLBCL IVS

114 DLBCL patients, retrospective study  
5 centers (4 European, 1 USA)  
23-80 y, aalPI=0-3, R-chemo, MFU= 39m



# Hodgkin Lymphoma n=59

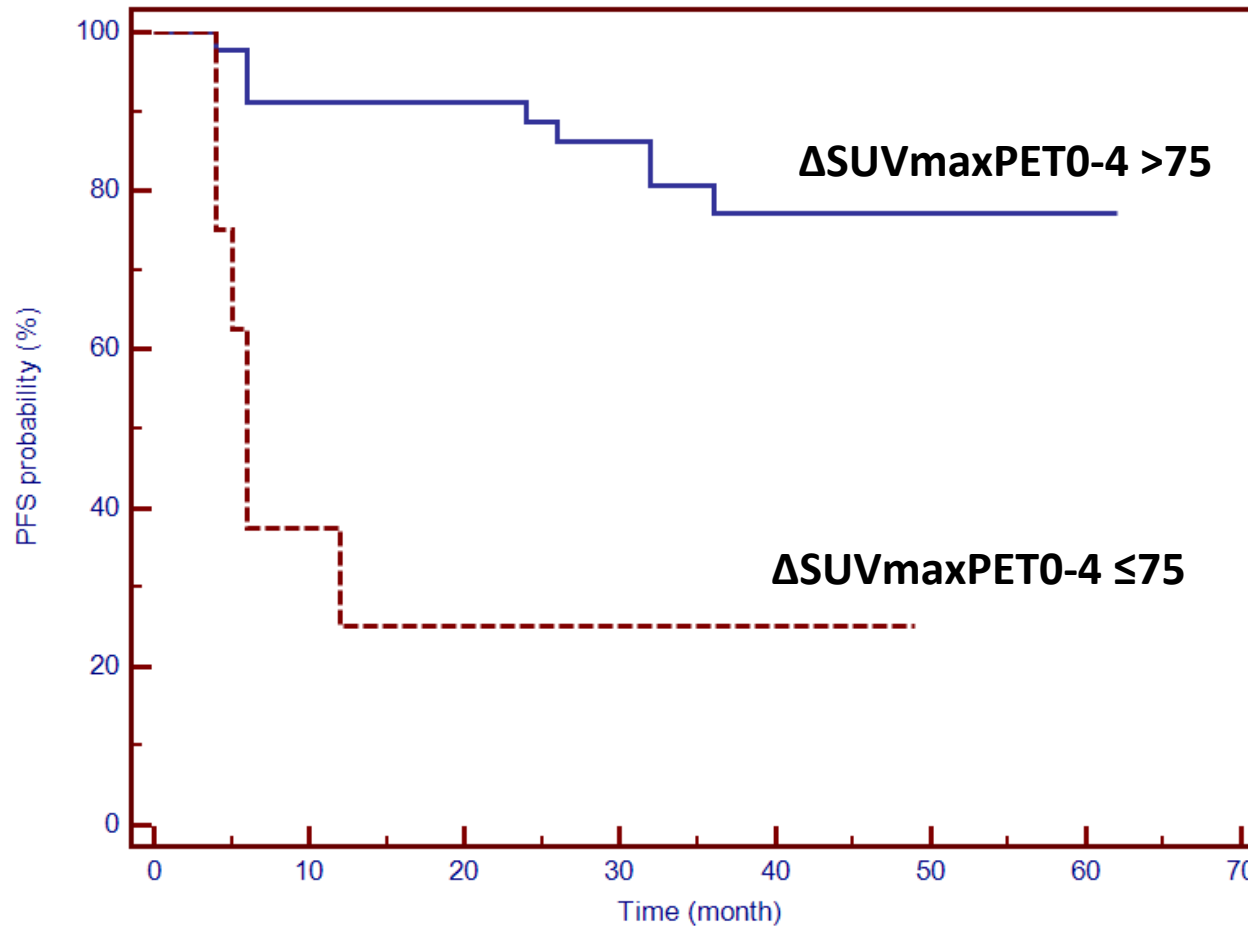
PFS according to  $\Delta\text{SUVmaxPET0-2}$



*Kanoun et al, 2012 Menton*

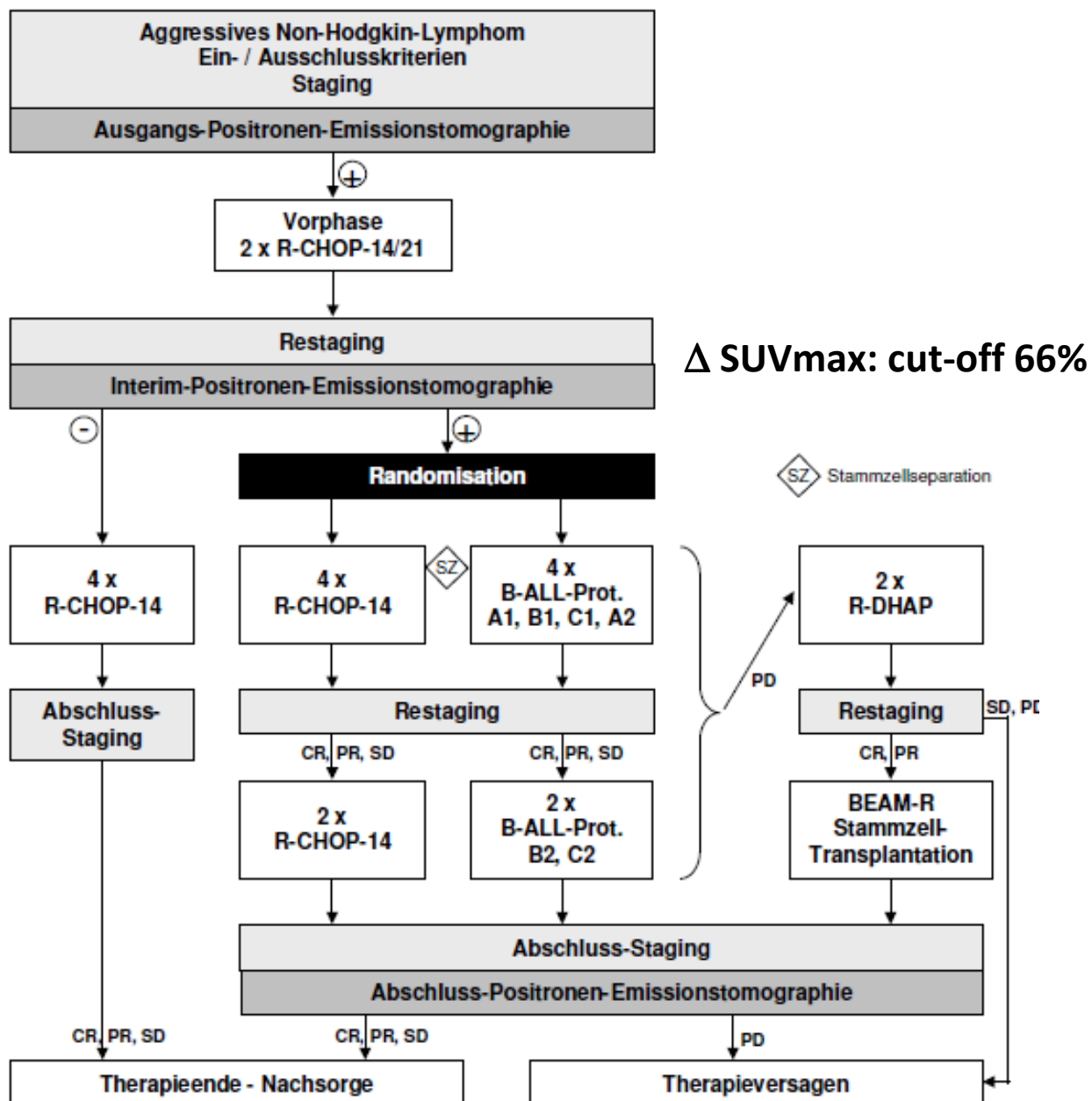
# Hodgkin Lymphoma n=59

PFS according to  $\Delta\text{SUVmaxPET0-4}$



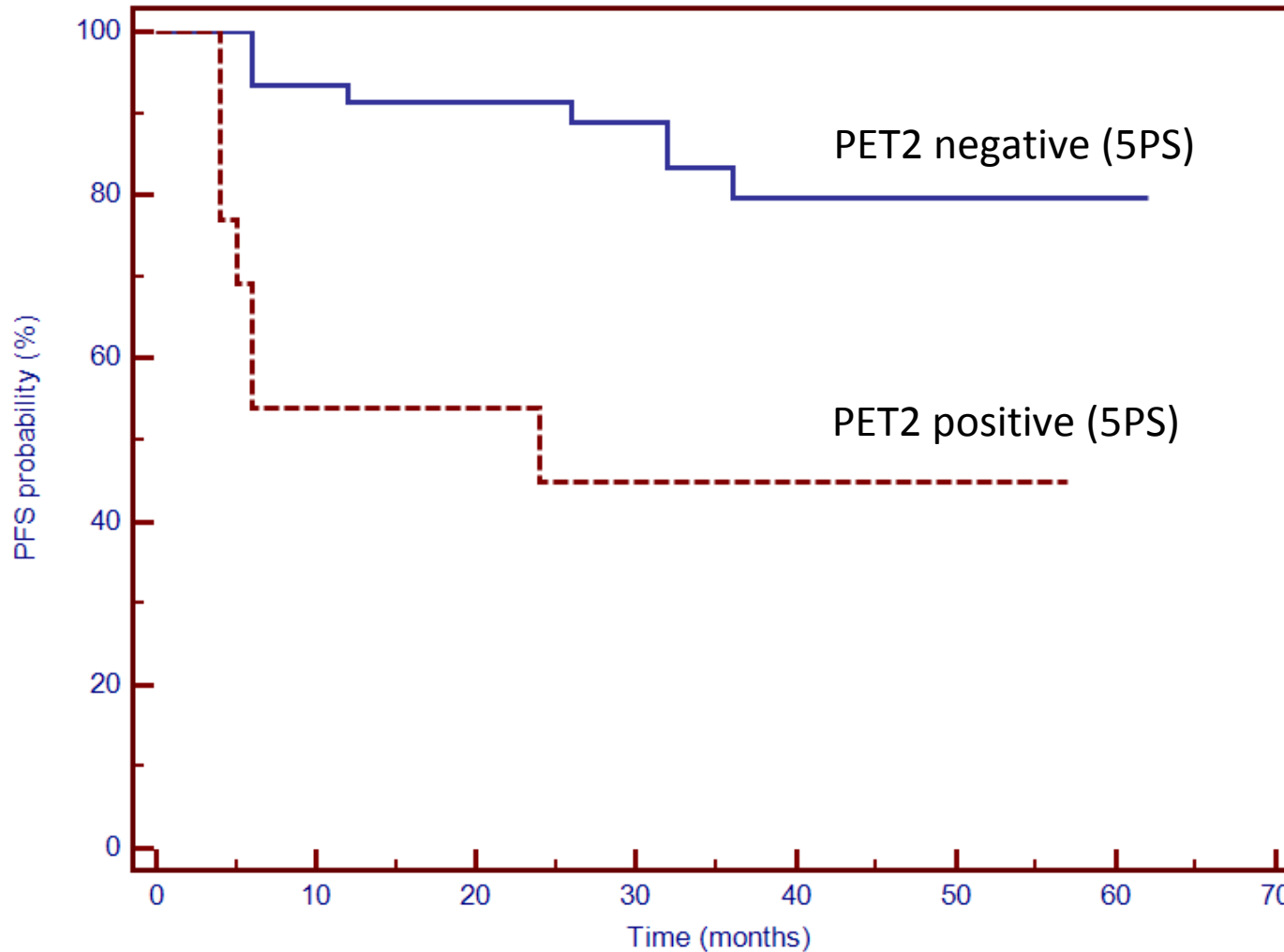
# PETAL

DLBCL: 18-60y





# PFS according to PET2 (5PS)



# PFS according to PET4 (5PS)

