What is the best cut off to divide score 4 & 5

Can we better define patients with clinically significant uptake within these groups?
Deauville 5 point Scoring System

- Score 1: no uptake
- Score 2: uptake ≤ mediastinum
- Score 3: uptake > mediastinum but ≤ liver
- Score 4: moderately increased uptake > liver
- Score 5: markedly increased uptake
  AND / OR
  new lesion(s) likely to be lymphoma
Why do we separate moderate from marked? What is the cut-off?

Should 4 be residual and 5 be new?

Should we reduce 4 further:
  – Does 4 include some of the good prognosis patients?
  – If yes, should we try to reduce 4 and increase 5?

Is the cut-off dependent on timing?

How to decide on significance of new? Role of MDM? Role of interpretation i.e. likelihood of inflamm?
Why do we separate moderate from marked? What is the cut-off?
$P < .001$
Score 5
Deauville Consensus on Response Criteria

Statement 3 (interpretation).
- A visual analysis using a 5-point scale should first be applied.
- The preferable reference scale should be the mediastinum and the liver.

Statement 4 (scoring).
The 5-point scale.
1. No uptake.
2. Uptake ≤ mediastinum.
3. Uptake > mediastinum but ≤ liver.
4. Uptake moderately more than liver uptake, at any site.
5. Markedly increased uptake at any site and new sites of disease.

Statement 5 (cutoff).
- For categories 2–4, correction methods by means of the \( \text{SUV}_{\text{max}} \) should be investigated.
- For therapeutic decisions, this should be determined according to the clinical strategy planned (consider lymphoma subtypes, and the decision for (de)-escalation of therapy).
Should 4 be residual and 5 be new?
How often is progression?

<table>
<thead>
<tr>
<th>NCRI Study Score</th>
<th>Deauville Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td>No of Patients</td>
</tr>
<tr>
<td>1</td>
<td>28</td>
</tr>
<tr>
<td>2a</td>
<td>26</td>
</tr>
<tr>
<td>2b</td>
<td>68</td>
</tr>
<tr>
<td>2c</td>
<td>3</td>
</tr>
<tr>
<td>2d*</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>125</td>
</tr>
</tbody>
</table>

(*) 2d = Increase in abnormal uptake &/or appearance of new sites
Should we remove “new”?

- Probably useful for other types of lymphoma
should we try to reduce 4 and increase 5?
Does 4 include some good prognosis patients?

<table>
<thead>
<tr>
<th>Deauville Score</th>
<th>SUV reduction</th>
<th>No of Patients</th>
<th>&gt;66%</th>
<th>≤ 66%</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Score</td>
<td>&gt;66%</td>
<td>≤ 66%</td>
</tr>
<tr>
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<td>0</td>
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<tr>
<td>3</td>
<td></td>
<td>28</td>
<td>25</td>
<td>3 **</td>
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<tr>
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<td></td>
<td>125</td>
<td>111</td>
<td>14</td>
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</table>
• Optimal cut-off between +/- (at least for DLCL) may be within score 4.
• How do we optimise score 4?
How to decide on 4/5 cut-off

• Differentiate between moderate & marked only visually?
• More objective cut-off? e.g. 2 times or 3 times liver uptake
# 4/5 cut-off

<table>
<thead>
<tr>
<th>Score</th>
<th>No of Patients (Score 5= 3x liver)</th>
<th>Score 5= 2x liver</th>
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<tbody>
<tr>
<td>1</td>
<td>28</td>
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<td>2</td>
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<td>3</td>
<td>28</td>
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<tr>
<td>4</td>
<td>36</td>
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<tr>
<td>5</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>TOTAL</td>
<td>125</td>
<td></td>
</tr>
</tbody>
</table>
• Majority prefer a reproducible “objective” cut-off.
• No agreement on cut-off. More data is needed on outcome before we decide.
Is the cut-off dependent on timing?
DLBCL: $\Delta$SUV $>2$ v $>4$

**SUV Analysis**

$\Delta$SUV$_{max}$ PET0/PET2

- Probability of EFS
- $>65.7\%$
- $P < .0001$
- $\leq 65.7\%$
- $P < .0001$

**SUV analysis**

$\Delta$SUV$_{max}$ PET0/PET4

- $>72.9\%$
- $P < .0001$
- $\leq 72.9\%$


• Why do we separate moderate from marked? What is the cut-off?
• Should 4 be residual and 5 be new? (will increase 4)
• Should we reduce 4 further:
  – Does 4 include some of the good prognosis patients?
  – If yes, should we try to reduce 4 and increase 5?
• Is the cut-off dependent on timing?
• How to decide on significance of new? Role of MDM? Role of interpretation i.e. likelihood of inflammation?
Why early response is better?

Early CR curve

Late CR curve

PET detection

Tumour load

Early CR curve

Late CR curve

PET detection

time
NCRI study PET scoring

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
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<td>Negative</td>
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</tr>
<tr>
<td></td>
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<tr>
<td></td>
<td>2d</td>
</tr>
</tbody>
</table>
Discriminant index post test/pre test probability of progression in DLBCL for various criteria (interim PET 2 cycles)

MFU = 40 months

Cinotti, Meignan J Nucl Med, 1983
Diamond et al, J Clin Invest, 1980