AIM

- Most patients at our hospital receive an echocardiogram after pulmonary embolism (PE).
- A tool to predict right heart strain based on the diagnostic computed tomography pulmonary angiogram (CTPA) could reduce unnecessary echocardiograms.
- And improve the utilisation of limited healthcare resources.
- The Modified Miller Score can quantify thrombus burden on CTPA scans (1,2).
- Therefore, the aim of this study was to assess the utility of the Modified Miller Score for correctly identifying right heart strain.

METHODS

- A retrospective observational cohort study.
- Inclusion criteria: patients over 18, between July 2014-September 2015 with a CTPA showing PE, a post-PE echocardiogram, and a primary hospital discharge diagnosis of PE.
- The study had two sequential stages.
- Stage I: Modified Miller Scores were calculated for 10 patients by four radiologists independently to assess inter-rater reliability.
- Stage II: Modified Miller Scores were calculated for 90 patients in total and compared to right heart strain findings on the post-CTPA echocardiogram.
- Statistical significance was tested using the Mann-Whitney U test with p<0.05 indicating significance; potential clinical utility was assessed using the receiver operating characteristic (ROC).

OUTCOMES/RESULTS

- Stage I: Interclass correlation 0.980.
- Stage II: 48 patients had right heart strain, 42 did not, and the median (inter-quartile range) of the Modified Miller Scores in the two groups were: 15.0 (6.25-16.0) and 7.50 (3.00-14.25), respectively (p<0.05).

### Table 1: Factors influencing right heart strain.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Presence of right heart strain on Echocardiogram (n=48)</th>
<th>Absence of right heart strain on Echocardiogram (n=42)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Mean ± SD)</td>
<td>66 ± 18</td>
<td>58 ± 17</td>
</tr>
<tr>
<td>Male (No. %)</td>
<td>20 (47%)</td>
<td>23 (54%)</td>
</tr>
<tr>
<td>Charlson Co-morbidity index score (median, IQR)</td>
<td>4 (0,8)</td>
<td>4 (0, 6.5)!</td>
</tr>
<tr>
<td>At least one risk factor for PE (%)</td>
<td>23%</td>
<td>21%</td>
</tr>
<tr>
<td>Delay in performing Echocardiogram from CTPA in days (median, IQR)</td>
<td>4 (1,47)</td>
<td>16.5 (2,93)*</td>
</tr>
<tr>
<td>MMS score (median, IQR)</td>
<td>15 (6,16)</td>
<td>9 (3,14)*</td>
</tr>
</tbody>
</table>

CONCLUSIONS

- Modified Miller Score is statistically significantly associated with right heart strain.
- Nevertheless, the Modified Miller Score is unlikely to be sufficiently predictive of post-PE right heart strain for clinical utility.
- Further study is required to improve the predictive performance of the Modified Miller Score.

REFERENCES