evidence of myocardial fibrosis (LGE) by the time of AVR, which does not regress post-operatively. Equally there is a failure of myocardial perfusion reserve to improve. This suggests that although significant LV remodelling occurs it is likely that irreversible fibrosis limits improvement in functional capacity.

### Abstract 076 Table 2

<table>
<thead>
<tr>
<th></th>
<th>Pre-operative</th>
<th>Post-operative</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>VO2 (ml/kg)</td>
<td>15.4 (4.1)</td>
<td>16.0 (5.0)</td>
<td>0.24</td>
</tr>
<tr>
<td>Respiratory exchange</td>
<td>1.1 (0.1)</td>
<td>1.1 (0.1)</td>
<td>0.62</td>
</tr>
<tr>
<td>Heart rate (%)</td>
<td>85 (12)</td>
<td>88 (12)</td>
<td>0.08</td>
</tr>
<tr>
<td>VE/VCO2 slope</td>
<td>29.2 (3.7)</td>
<td>29.7 (3.7)</td>
<td>0.38</td>
</tr>
<tr>
<td>NYHA</td>
<td>i=9; ii=32; iii=5</td>
<td>i=35; ii=7; iii=1</td>
<td>0.03*</td>
</tr>
<tr>
<td>NT-proBNP (Log fmo/ml)</td>
<td>2.20 (0.73)</td>
<td>2.23 (0.56)</td>
<td>0.70</td>
</tr>
</tbody>
</table>

### Abstract 077

**Osteoporosis and Bisphosphonate’s Use Associated with Reduced Progression of Calcific Aortic Stenosis: Retrospective Observational Single Centre Study**

Y Saeed,* D Lythgoe, P Garg, S Chuah. University Hospital Aintree NHS trust, Liverpool, UK

**Purpose**

Progression of Aortic Stenosis (AS) has been subject of much debate in the recent past with studies evaluating effects of statin therapy. Little is known about the factors that affect progression of AS. Recently there is a growing interest in the field of Bone modulators reducing progression of AS. In this study we aim to study the effects of osteoporosis and bisphosphonate on progression of calcific AS.

**Methods**

Retrospective electronic case notes of patients who had diagnosis of AS with at least two echocardiogram between 2005 and 2009 were studied. Exclusion criteria includes diagnosis of Rheumatoid arthritis or AS with at least two echocardiogram between 2005 and 43 years with aortic valve surgery. The orientation of curved bi-leaflet aortic prosthesis in patients undergoing aortic valve replacement (AVR).

**Objectives**

Whether this result was due to bone metabolism associated with either osteoporosis and/or bisphosphonate use needs to be clarified further in randomised control trials.

**Conclusion**

Our study has shown that Osteoporotic patients on Bisphosphonate have significantly decreased progression of AS. Whether this result was due to bone metabolism associated with either osteoporosis and/or bisphosphonate use needs to be clarified further in randomised control trials.

### Abstract 078

**A Randomised Study of the Effects of Bi-Leaflet Prosthesis Orientation on Aortic Haemodynamics and Coronary Flow Velocity Profiles**

J L Feng, X Du, C Ratnatunga, R Pillai, X Y Jin.* Oxford University Hospital NHS Trust, Oxford, UK

**Objectives**

The orientation of curved bi-leaflet mechanical prosthesis has been shown to significantly affect the development of aortic sinus flow in the in vitro study. However, its clinical implication for trans-aortic pressure gradient or coronary flow dynamics remains to be defined. The present study was aimed to characterise these two haemodynamic aspects by randomising the orientation of MIRA aortic prosthesis in patients undergoing aortic valve replacement (AVR).

**Methods**

45 patients (58±12 years, 36 males) undergoing AVR with a MIRA prostheses were randomised to anatomic (leaflets parallel to left coronary) or anti-anatomic (leaflets perpendicular to left coronary) orientation. Echocardiography was performed at 1 week and 12 months after AVR to assess prosthesis pressure gradient, LV mass and LAD flow velocity profiles.

**Results**

Aortic prosthesis and coronary LAD haemodynamics were analysed with respect to follow-up time and orientation by twoway ANOVA. In valve size >23 mm, prosthesis orientation did not affect valve haemodynamics, LAD flow profiles or LV mass index (all p>0.05). In valve size ≥23 mm, anti-anatomic orientation group had higher mean prosthesis pressure gradient (3.1±0.5 vs 6.3±0,5, mm Hg, p=0.025), but also a greater LAD systolic flow velocity (17.5±1.1 vs 13.8±1.4, cm/s, p=0.048) and longer LAD systolic flow duration (235±7 vs 208±9, ms, p=0.030) than those of anatomic orientation. LAD diastolic flow velocity and LV mass index did not differ between the two orientations (p>0.05).

**Conclusions**

Anti-anatomic orientation of MIRA aortic prosthesis appears to produce more physiological LAD systolic flow profiles, which can be explained by a stronger aortic sinus vortices flow demonstrated by previous in vitro study. A greater pressure gradient in the same orientation, however, suggests the possibility of fluid dynamics across its central orifice may be insulated by the vortices flow in aortic sinus, implying a complex 3D velocity profile produced by the curved bi-leaflets prosthesis.