Many of our closest relatives are dying of a broken heart. But zoo keepers the world over are left scratching their heads as to why this is. Our great ape cousins (gorillas, chimpanzees, orangutans and bonobos) do not drink alcohol or smoke cigarettes, nor do they spend their weekends eating takeaways or fried breakfasts. So why is it that they too, like us, are so prone to heart disease?

A dedicated team of scientists, vets and pathologists at the University of Nottingham and Twycross Zoo are working hard to get to the heart of the matter. They’re finding that it’s not just ‘lifestyle’ that sets us apart from great apes when it comes to heart disease (see Table 1). Read more about some of the fascinating work they do below.

### Table 1: Comparison of the main features of cardiovascular disease in humans and non-human great apes

<table>
<thead>
<tr>
<th></th>
<th>HUMANS</th>
<th>GREAT APES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLINICAL SIGNS &amp; SYMPTOMS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shortness of breath, chest pain, fainting &amp; dizziness, swollen limbs¹</td>
<td>Sudden (unexpected) death²</td>
<td></td>
</tr>
<tr>
<td>Echocardiography, ECG, blood pressure; tried and tested, good knowledge of what is ‘normal’</td>
<td>Limited understanding of how to extrapolate tests to apes/what is normal vs. abnormal³</td>
<td></td>
</tr>
<tr>
<td>Easily performed in awake patient</td>
<td>(Usually)⁴ requires anaesthesia of patient</td>
<td></td>
</tr>
<tr>
<td><strong>TREATMENT</strong></td>
<td>No therapeutics studies клинических испытаний; no published data⁵</td>
<td>Limited feasibility of patient monitoring</td>
</tr>
<tr>
<td>Lots of evidence relating to drug doses, effects, side effects</td>
<td>Patients can be closely monitored and symptoms managed</td>
<td></td>
</tr>
<tr>
<td><strong>MOST COMMON PATHOLOGY</strong></td>
<td>Atherosclerotic coronary artery disease⁶</td>
<td>(Idiopathic) myocardial fibrosis⁷,⁸</td>
</tr>
<tr>
<td><strong>CAUSES</strong></td>
<td>Diet, smoking, obesity, inactivity, family history, concurrent disease (e.g. diabetes)⁹</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

¹Some assessment of the heart is possible without the need for examination/anaesthesia, see below (‘heart screening’)

**HEART SCREENING**

Great apes at zoos across Europe undergo heart assessments under anaesthesia as part of routine health checks. These assessments include an electrocardiogram (ECG) and a heart ultrasound or echocardiogram (‘echo’).

Some chimpanzees and gorillas at Twycross Zoo are even trained to have their heart rate and rhythm recorded without the need for anaesthesia.

IMAGES: top left – anaesthetised chimpanzee undergoing ECG assessment; bottom left – example image from a chimpanzee ‘echo’; top right - chimpanzee training for awake ECG assessment; bottom right - interactive sign at Twycross Zoo explaining the work they do.

**REFERENCES**

8. Twycross Zoo explaining the work they do.
9. For more information please visit: http://www.twycrosszoo.org/ape-heart-project.aspx or email: heartproject@twycrosszoo.org

**SO WHAT DOES BECOME OF THE BROKEN HEARTS?**

1. Basic post-mortem examination and sampling by zoo vet/pathologist as part of complete necropsy
2. Heart undergoes detailed examination at University of Nottingham
3. Report issued to zoo and data entered into database

**PREVENTION IS BETTER THAN CURE**

Study findings to date are offering hints and clues as to the pathophysiology of this deadly disease. Further work investigating the following possible causes is ongoing:

- Viruses
- Genetics
- Diet

Identifying the cause(s) will help to reduce (or even prevent) heart disease related deaths.