<table>
<thead>
<tr>
<th>Heart valve replacement option</th>
<th>Constructed from...?</th>
<th>Lifetime of valve?</th>
<th>Does the valve cause blood clotting? (Y/N)</th>
<th>Summary of advantages / disadvantages</th>
</tr>
</thead>
</table>
| Mechanical valve             | Alloys, silicone, pyrolitic carbon, polyester | Designed to last a lifetime | Yes | **Pro:** These valves last much longer than prosthetic valve.  
**Con:** The valve can cause clotting meaning that the patient must take “anti-coagulant” medication. Backflow of blood can be an issue. |
| Bioprosthetic / prosthetic valve | Human or animal tissue | 10-15 years | No | **Pro:** Using a natural material for the valve makes blood clotting unlikely.  
**Con:** Valve needs to be replaced every 10-15 years. |

Follow-up questions:

1) Would you recommend a mechanical or prosthetic heart valve replacement to a 45-year-old patient?

The 45-year-old should probably receive the mechanical heart valve, even though he/she will need to take anti-coagulant medication, because a prosthetic valve would need to be replaced multiple times during the rest of the patient’s life, assuming the patient lives to be 80 or 90-years-old.

2) What type of value would you recommend to a 93-year-old patient?

The 93-year-old patient should receive a prosthetic heart valve because the body more readily accepts natural tissue over artificial materials, meaning that the risk of blood clots is minimal and anti-coagulant medication is not needed. Furthermore, prosthetic valves typically prevent blood backflow better than mechanical valves.

Put Your Heart into Engineering lesson — Replacement Valve Evaluation Table Answers