

## Capstone for Impact Submission | GY2020

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**Project Title:** The Influence of Age on Longevity of a Stentless Bioprosthesis Valve

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**Advisor Names(s):** Dr. Bo Yang

**Branch:** Procedural

**Path of Excellence:** Scholarship of Learning and Teaching

*If this project can be continued by another UMMS student, please include your contact information or any other details you would like to share here: N/A*

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**Summary/Background:** The longevity of a stentless valve in a younger population (20-60 years old) is unknown.

**Methodology:** From 1992-2015, 1947 patients underwent aortic valve/root replacement for aortic stenosis, insufficiency, root aneurysm or aortic dissection with stentless bioprosthesis (median size: 26 mm). 105 patients were <40, 528 were 40-59, 860 were 60-74, and 454 were ≥75 years at operation. This data was obtained through chart review, administered surveys and the national death index.

**Results:** Thirty-day mortality rate was 2.6%. During follow up, 807 (41%) of patients expired before reoperation, 993 (51%) were alive without reoperations due to deterioration and 113 patients (5.8%) underwent reoperation for structural valve deterioration (SVD). After adjusting death and reoperation for non-SVD causes as competing risk, the cumulative incidence of reoperation was significantly different between the younger groups (<40, 40-59) and the older groups (60-74, ≥75)  $p < 0.0001$ , but not inside the younger (<40 vs 40-59) or older (60-74 vs. ≥75) group. The significant hazard ratio of reoperation for <40 vs ≥75 was 12, <40 vs 60-74 was 4, 40-59 vs 60-74 was 3, and 40-59 vs ≥75 was 9,  $p \leq 0.01$ . The 10- and 15-year survival in the whole cohort was 53% and 29%.

**Conclusion:** The stentless aortic valve provides satisfactory durability as a conduit for aortic valve/root replacement for patients who prefer a bioprosthesis. However, it should be judiciously considered for patients <60 years due to increased incidence of reoperation for structural valve deterioration.

**Reflection/Impact Statement:** Conducting this research was helpful in expanding knowledge for stentless aortic valves. This study examined a one of the largest cohorts of aortic stentless valves for cardiac surgery. The findings of this project will be helpful in the field of cardiac surgery in consideration of stentless valves in different age groups. Our results demonstrated patients younger than 60 years at the time of surgery had increased reoperation rates, which is why careful consideration should take place at the time of surgery when implanting stentless valves.

My advice for other students completing their CFI would be to find a project which they can work on from start through manuscript writing. Doing my project allowed me to see different aspects of working on research from writing IRB/proposals to corresponding for manuscript review.