

## Capstone for Impact Submission | GY2019

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**Project Title:** Akis: Improving Contact Lens Hygiene

**Student Name(s):** Neva, Jennifer

**Advisor Names(s):** Nick Nelson/Sling Health

**Branch:** Procedure Based Care

**Path of Excellence:** Global Health Disparities

**Handover/Transition:**

If this project can be continued by another UMMS student, you may contact them at the following email address/phone number (N/A if project cannot be handed over): **NA**

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**Summary:**

For my Impact Project, I joined an organization on campus, Sling Health, that gathers together medical, business, law, and engineering students to develop an innovative solution to a healthcare problem.

My group members and I looked at a variety of areas in medical care, including telemedicine, cardiac resuscitation, and physical deconditioning. After several brainstorming sessions, my team decided to develop a device that would help consumers improve their contact lens hygiene in order to prevent infections, such as keratitis.

There is a huge population of people that use contacts, and many of them are non-adherent to the CDC's recommended contact lens-care practices. In fact, per the CDC, 40-90% of wearers do not properly follow the care instructions for their contact lenses. There are also approximately one million health system visits for keratitis per year, costing the US healthcare system \$175 million dollars and 250,000 hours of clinical time.

We conducted a consumer survey, primarily of graduate students, to determine how patients wear and care for their contact lenses. In our survey, 34-85% of wearers were not adherent to the different subsections of the CDC's recommended care practices. The reasons for non-adherence were cited as inconvenience, amount of time required, expense, and not feeling it was necessary or useful.

We therefore designed a physical prototype that would clean the contact lenses and case at appropriate intervals. It is also linked to a mobile app that reminds patients to remove their contacts before going to bed and when to reorder lenses or cases. We will present our final prototype at Sling Health Demo Day on March 27th.

**Methodology:**

We initially performed a cross-sectional survey of current contact lens users to ascertain current behavioral practices. We then worked with biomedical engineering students to develop a physical prototype using Catia and 3D printing technology to address the shortcomings in the status quo. We also met with attending Ophthalmologists and stake-holders to incorporate their valuable insight.

**Results/Conclusion:**

Physical prototype results/conclusions are pending live demonstration at Sling Health Demo Day.

**Reflection/Lessons Learned:**

Medical innovation is a complex environment to operate in without prior experience. The end results are still pending the demonstration, but this project has reinforced the importance of including different perspectives in the process of quality improvement.