**Introduction**

- As the scleral contact lens (ScCL) modality continues to increase in popularity, evaluation of the physiological implications is becoming increasingly important.
- Due to the increased tear reservoir depth and contact lens thickness of the ScCL modality (Figure 1), there has been concern of inducing corneal hypoxia in ScCL wearers.
- Theoretical and clinical research has suggested that the ScCL provokes corneal swelling, though there is some debate as to whether the amount of swelling has clinically relevant complications.

**Methods**

- This is a record review of full time ScCL wearers who were fitted by experienced practitioners at the University Eye Institute between January 2013 and August 2015.
- Corneal Tomography data (Pentacam) was collected from a total of 80 eyes of 46 subjects who fit the following criteria:
  - between 200 and 400um tear film reservoir thickness.
  - Lens Dk >100
  - Pentacam data collected between 2pm and 4pm.
- The average pachymetry values were measured before and after initiating ScCL wear ("after" values range from between 1mo and 17mo post lens initiation).
- Measurements were collected three different corneal locations – superior, central, and inferior cornea (Figure 2).

**Results**

- Due to the wide range of baseline corneal thickness measurements, the percent swelling can be difficult to compare between subjects (ie. thinner corneas will show higher percent swelling values than thicker corneas with the same raw amount of thickness change). Therefore, we show the raw data of corneal thickness change here. The thickness change values are calculated by subtracting the baseline values (taken prior to ScCL initiation) from the post-lens thickness values (taken between a range of 1 to 17mo post lens initiation).

**Results cont.**

- In our continued research, we are interested in trends over time for individual ScCL Wearers. The graphs below show the corneal thickness values of 9 eyes over a period of 1 to 17 months.