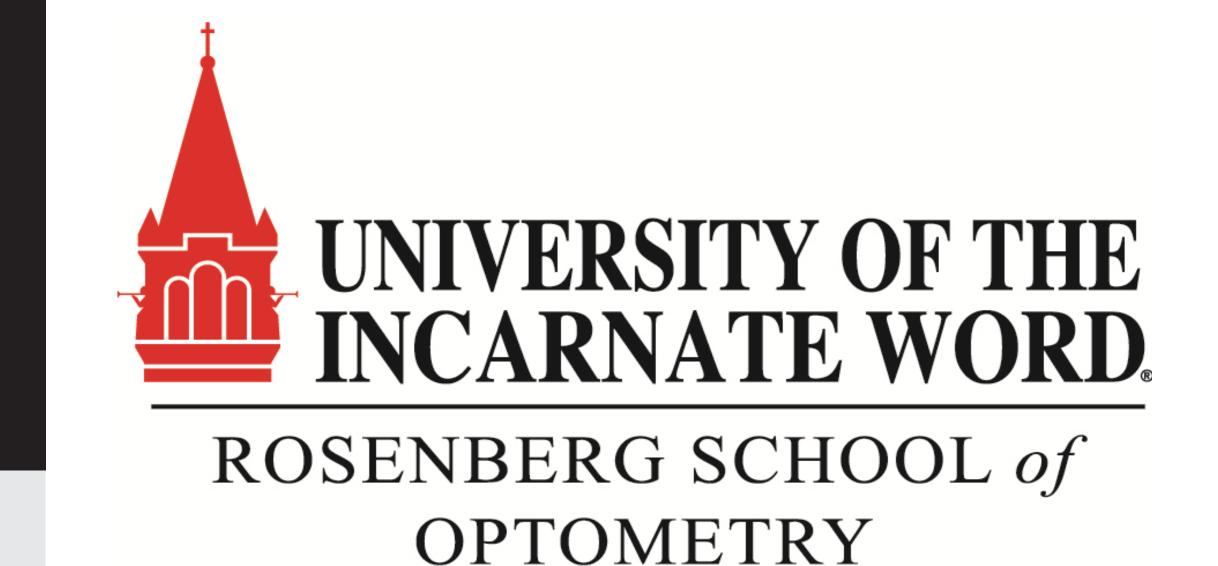
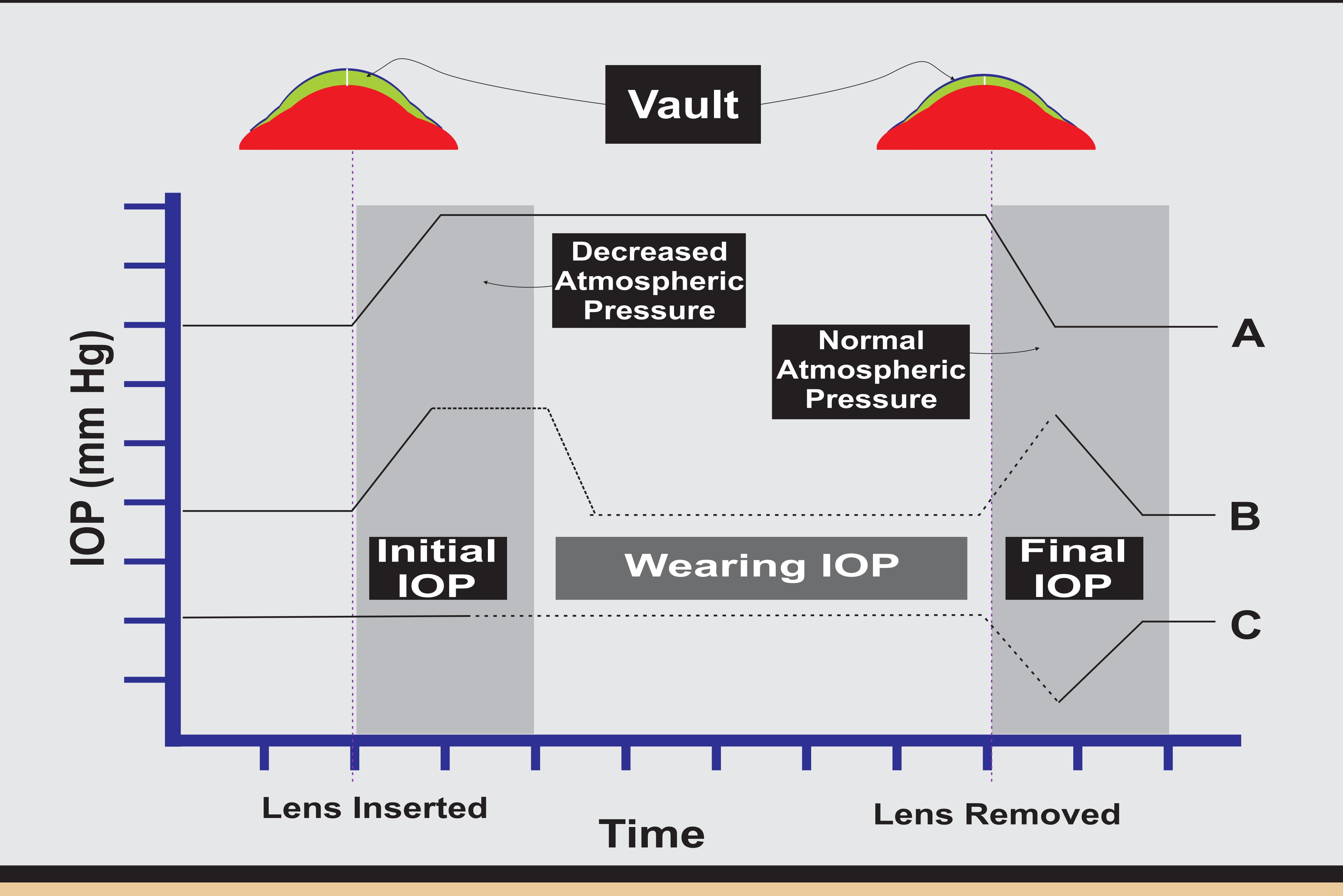
Model of IOP profile with Scleral Lens on the eye.





A. Philip Aitsebaomo: aitsebao@uiwtx.edu
Jeanette Wong-Powell
William Miller
Farshid Amir

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The purpose of this model is to estimate Intraocuar Pressure (IOP) as a function of the duration of Scleral Iens (SL) wear. With increased popularity of SL for treating irregular cornea1,2, it is important to investigate the effect they may have on the eye, specifically, if they have any impact on IOP. It was suggested in 1930 that SL wear might affect IOP3. An elevation in IOP was found in some subjects, but a decrease in others in a 1951 study4. In another study where IOP was measured with iCare tonometer prior to lens insertion and after lens removal, a significant elevation in IOP was reported after 8 hours of SL wear5. The study inferred IOP with the lens on the eye from IOP measured immediately after lens removal. IOP with Diaton tonometer with the lens on the eye were also consistently elevated6. The mechanism for IOP elevation while wearing SL is unknown but is suggested to be related to changes in Episcleral Vein Pressure (EVP)7,8.

Three models of IOP as a function of duration of SL wear are evaluated by comparing predicted IOP from recent studies. Loss of fluid under the lens (settling) in the first few minutes or hours of wear is expected to result in negative atmospheric pressure under the lens, possibly leading to elevated IOP subsequent to possible change in EVP (Initial IOP, A & B). Continuous lens wear may keep IOP elevated (Wearing IOP, A), or return to baseline (Wearing IOP, B) if there is a compensatory mechanism that increases outflow. When the lens is removed, the eye returns to normal atmospheric pressure, which presumably returns IOP to baseline (Final IOP, A), unless forces associated with lens removal cause elevation (Final IOP, B), or depression (Final IOP, C) of IOP. Model A is the only one consistent with results from recent studies. Eye Care professionals must be cognizant of possible elevated IOP when prescribing SL.