INDIANA UNIVERSITY
SCHOOL OF OPTOMETRY

# Silicone Hydrogel Fitting Trends in an Optometric Institution

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## ABSTRACT

**Purpose**: To compare the saturation of silicone hydrogel contact lenses in the Indiana University School of Optometry (IUSO) clinic system from the same quarter 2005 and 2006 to determine the growth of this lens material over time.

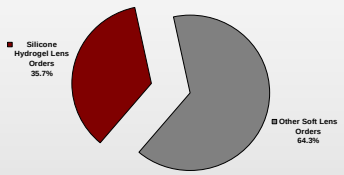
**Methods**: Data of all soft contact lens supply orders in IUSO clinics from the 1st Quarter (1stQ) of both 2005 and 2006 was compiled. The total number of orders placed for all soft contact lens materials was compared with the orders for silicone hydrogel materials and those orders were then examined by lens design. Finally, the saturation of silicone hydrogel orders and their percent growth from 1stQ 2005 to 1stQ 2006 in the IUSO clinic system was compared to nationwide saturation and growth.

**Results**: There were 866 soft lens orders during 1stQ 2005 and 1126 soft lens orders during 1stQ 2006. Upon analysis, of 1stQ 2005 orders, 309(35.7%) were silicone hydrogel with the remaining 557(64.3%) comprised of other soft lens materials. Comparing this data to 1stQ 2006 when 627(55.7%) orders placed were silicone hydrogel and 499(44.3%) of orders were other soft lens materials, there was 30.0% growth in total soft lens orders with 102.9% growth in silicone hydrogel.

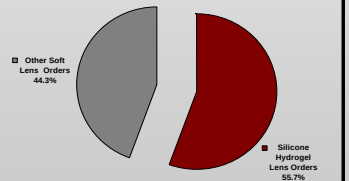
Of the 309 1stQ 2005 silicone hydrogel orders, 305(98.7%) were single vision and 5(1.3%) were toric. To compare, of the 627 1stQ 2006 orders, 529(84.4%) were single vision, 96(15.3%) were toric and 2(0.3%) were multifocal. This relates to a 73.4% growth in the number of single vision silicone hydrogel orders and 2300% growth in the number of toric silicone hydrogel orders. The growth is probably attributable to both the release of new lens designs and to an overall increased awareness of the benefits of silicone hydrogel lenses.

**Conclusion**: There was a clear increase in the prescribing of silicone hydrogel materials in the IUSO clinics. Anecdotal data suggests silicone hydrogel fits nationwide may total approximately 40-45% for 2006, an increase from the HPR reported 29% silicone hydrogel fits in 2005. Academic settings, such as the IUSO clinics, may be early adapters with this emerging trend.


**1st Quarter 2005 Contact Lens Orders**




**1st Quarter 2006 Contact Lens Orders**




## Results

Review of the total soft contact lens orders for the Indiana University School of Optometry clinics for the 1st Quarter of 2005 showed 866 orders, of which 35.7% were for a silicone hydrogel material lens.

In the 1st Quarter of 2006 the number of soft contact lens orders had increased to 1126. Of this total, 55.7% of all soft contact lens orders were for a lens made in one of the silicone hydrogel materials.

Of the silicone hydrogel contact lenses ordered in the 1st Quarter of 2005, 98.7% were spherical lens designs, and only 1.3% were orders for toric soft contact lenses. By the 1st Quarter of 2006, spherical lenses constituted 84.4% of all silicone hydrogel orders. Soft toric silicone hydrogels had grown to 15.3%, and multifocals had broken into the category accounting for 0.3% of all silicone hydrogel soft contact lens orders.

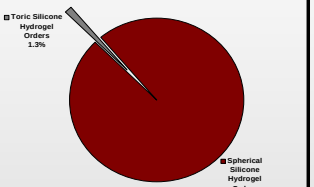
## Discussion

From the 1st Quarter of 2005 to the 1st Quarter 2006, silicone hydrogel contact lenses usage showed significant growth at the IUSO clinics. A portion of this growth might be attributed to the introduction of more lenses in the silicone hydrogel category, as is evidenced by the increase in the use of soft torics from 1.3% in 2005 to 15.3% in 2006, as well as some introduced parameter expansions. The greatest reason for the growth, however, is the perceived and witnessed benefits to patients from silicone hydrogels.

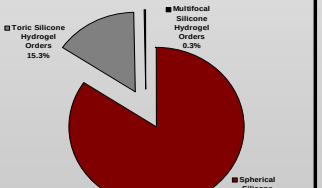
Breaking the data down further reveals that the percentage use of silicone hydrogels is very nearly identical for new fits and for patients being refit from other soft contact lenses. When looking at contact lens fits, not orders, the 1st Quarter 2006 showed 68% of refits and 69% of new fits were in silicone hydrogel materials.

For both quarters analyzed, the IUSO clinics utilization of silicone hydrogel lenses exceeded the national averages. Sometime before the end of 2005, silicone hydrogels became the most common lens modality at IUSO clinics, while it is predicted to happen nationwide sometime in early 2007.

**Silicone Hydrogel Orders by Design 1st Quarter 2005**




**Silicone Hydrogel Orders by Design 1st Quarter 2006**




## Why fit Silicone Hydrogels?

The most compelling reason to fit patients in silicone hydrogel contact lenses is to reduce complications related to corneal hypoxia. It has long been established that contact lens-induced hypoxia is likely responsible for many of the detrimental corneal effects of contact lens wear. Extended wear of contact lenses made from traditional hydrogel materials is known to provide excellent comfort and vision, but can compromise corneal physiology. Consequences include corneal edema and microcysts, myopic increases or progression, limbal hyperemia and corneal neovascularization.

Supplying 300-500% greater amounts of oxygen through the contact lens (which is possible with silicone hydrogel materials), can greatly reduce or eliminate these complications. It should be noted that the most serious adverse event related to extended wear of contact lenses, the risk of microbial keratitis, may not be reduced significantly by utilizing high oxygen transmission contact lenses. Therefore, educating patients as to symptoms of infection and the value of early intervention is very important with any contemplation of overnight lens wear.

Early pure silicone elastomer lenses were able to provide high levels of oxygen permeability, but lens binding, poor wettability and surface deposition made these lenses clinically unsuccessful. Advances in the ability to manufacture lenses that combine the oxygen transmission of silicone with the level of clinical performance of traditional hydrogel materials have negated the prior issues with the application of silicone elastomers. The significant increase in the amount of oxygen allows for a healthier cornea, with fewer hypoxic effects and fewer of the above mentioned complications.

Silicone hydrogel lenses, while not perfect, are rapidly becoming the standard of practice in contact lenses at the Indiana University School of Optometry. Both interns and faculty members have seen the value of this new category, and patients are being successfully fit and refit in silicone hydrogels. As increased lens options and parameters become available, their usage would be expected in increase further in the future. This new technology offers many patients the chance for safe and successful contact lens wear today, with the likelihood of fewer long-term effects or complications in the future.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