

# Settling Time of Two Jupiter™ Scleral Lens Diameters

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## Abstract

As scleral lens designs gain popularity, it is important to have more standardized methods for evaluating lens fit and to better understand lens settling rates and amounts. Very few full scope studies have been done that measure total settling amounts and settling rates of scleral lenses. The purpose of this study is to evaluate the settling rates for two diameters of Jupiter™ lenses, with the goal of determining an optimal settling time.

## Introduction

Most contact lens settling studies have focused on small diameter gas permeable lenses. There is little information on the settling amounts and rates of different types of scleral lens designs. It is important clinicians know both an average rate and amount of settling to expect to better determine the optimal time to access corneal vault of a lens and about how much initial vault is needed in order to account for lens settling over time.

## Methods

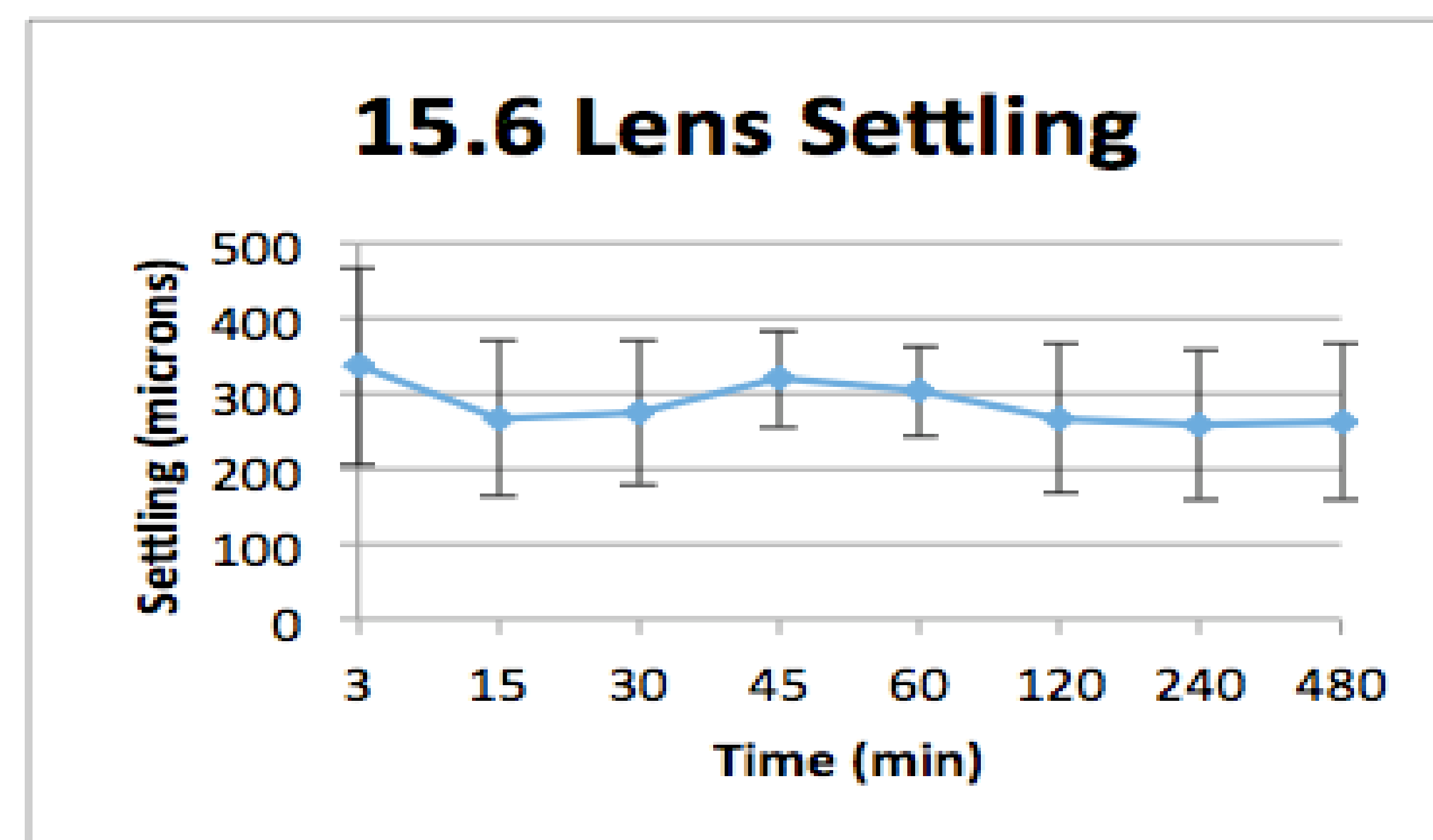
Using standard Essilor fitting sets, twelve participants were fit into both a 15.6 mm and 18.2 mm diameter Jupiter™ scleral lens. Six out of the twelve participants were unable to tolerate lens wear due to poor lens fits or conjunctival vessel blanching, and were excluded from the study. Each participant wore the first lens on the left eye for 8 hours. Measurements of the corneal vault of the lens were taken initially (3 minutes), at 15 min, 30 min, 45 min, 1 hour, 2 hours, 4 hours, and 8 hours using a Zeiss Visante™ Anterior Segment OCT.

The participants then wore the second lens on the left eye for 8 hours on a different day. The same eight measurements were obtained for the second lens as the first.

## Results

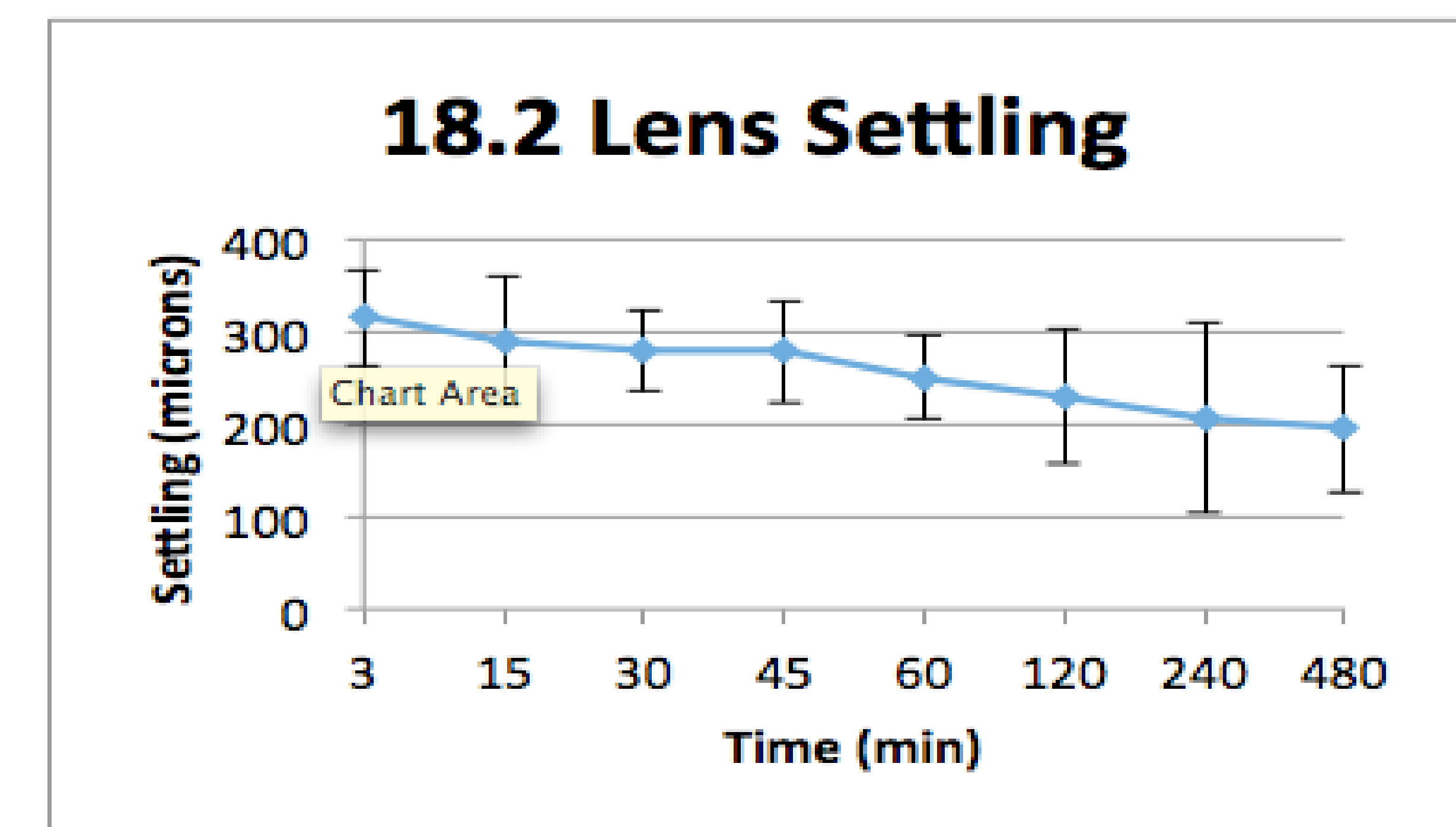
With each lens design, there was a decrease in vault over time. The initial clearance of the 15.6 diameter lens was, on average, slightly greater than that of the 18.2 diameter lens. The mean amount of settling with standard deviation error can be seen in Figure 1 and Figure 2. Average total settling over the eight hour period for the 15.6 diameter lens was 77.33 microns and was 120 microns for the 18.2 lens. There was a difference of 46.67 microns of settling between the two lenses. There was little difference in the vault amounts at the 4 and 8 hour measurements. At the 4 hour interval the average clearance for the 15.6 lens was 258.33 microns. An increase of 5 microns to 263.33 microns was noted at the 8 hour interval. For the 18.2 lens, the average clearance at the 4 hour interval was 206.67 and 195 at 8 hours, a decrease of 11.67 microns. This shows the majority of settling has occurred by the 4 hour interval.

Figure 1.



Average Settling of the 15.6 Diameter Lens

Figure 2.



Average Settling of the 18.2 Diameter Lens

## Discussion

There was a difference between the settling amounts of each of the diameters of lenses. Overall, the 18.2 lens settled more than the 15.6 lens. For both lens designs, the majority of settling had taken place by the 4 hour interval. This is clinically useful because it indicates four hours post application is a good time to evaluate for total lens settling. There was no correlation between lens settling amounts on each individual. This study showed that there is great variability in settling amounts depending on the individual and the diameter of the lens. Total amount of lens setting is mostly determined on the individual, their corneo-scleral junction, and lens/scleral interaction.