

**Comparison of the cost of contact lenses and contact lens solutions  
based on the frequency of replacement**

Kim Du  
Michigan College of Optometry  
February 13, 2003  
Dr. Paramore

## Comparison of the cost of contact lenses and contact lens solutions based on the frequency of replacement.

### **Abstract**

*The purpose of this study was to make a cost effective comparison between daily wear lenses, requiring no cleaning solutions as opposed to two-week lenses and monthly lenses, which require multipurpose cleaning solutions. Only multipurpose (chemical) care systems were used in this study. Twelve students selected from the Michigan College of Optometry were given multipurpose solutions to use for two weeks, with no specific instructions on cleaning protocol. The average yearly cost of use was based upon solution use as determined by bottle weight measurement. This study concluded that monthly lenses were more cost effective, based in part on the fact that the participants did not use the proper amount of solution to clean their lenses.*

### **Introduction**

As a Doctor, we look to the best interest of our patients. When a patient comes to see us, we determine the best options for them, from contact lenses to spectacles. In considering contact lenses there are hydrogel and rigid gas permeable lenses. When looking at soft contact lenses there are different brands and different wearing schedules including daily, two week or monthly. We consider our patient's occupation, life style, and ocular health to determine what brand and wearing schedule is best for them. But in addition to the cost of lenses, they need to also consider the yearly cost of solutions. When considering solutions, there are several types. In the past, there were the salt tablets with heat disinfection. Today, we mostly use multipurpose (chemical) or hydrogen peroxide disinfection systems. Multipurpose solution is further divided into no rub and rub with rinsing.<sup>5</sup> Immersion disinfection is a future type of multipurpose system, where the lens is just removed and directly placed into solution.<sup>5</sup> Multipurpose solution represents 80% of the United States market of chemical disinfection.<sup>6</sup> This study looks at the cost effective comparison between daily wear lenses requiring no cleaning solutions as opposed to two-week lenses and monthly lenses, requiring the use of a multipurpose solution.

## **Method**

Twelve students selected from the Michigan College of Optometry participated in the study. These students were current wearers of soft contact lenses, on either a two week or monthly basis and already used a multipurpose cleaning regimen. They were first given two bottles of solution from starter kits to be used for two weeks, then given more solutions if needed during that time period. Students were not given any specific additional instructions of how much solution to use or that they should follow any of the packet insert instructions. Students were informed to save empty bottles and unused portions of the last bottle. The amount of unused solution in any remaining bottle was determined by comparing its weight to full and empty bottles. The conversion factor was determined to be 1-gram equal to 0.0353 ounces, and 12 ounces equal to 1 bottle. Using this information, an estimation was made of how much solution is required for one year of cleaning. Solution average cost information was gathered from drug stores, discount stores and grocery stores, to calculate the cost for one year. The average cost of contact lenses was gathered from Michigan College of Optometry and two Internet companies.

## **Results**

The two-week lens brands included: Extreme H<sub>2</sub>O, Optima FW, Focus, Acuvue 2, Soft Lens 66 and Biomedics 55. The range of contact lens cost was found to be \$192 to \$152 with an average of \$169 per year. (Fig 1) Renu and Optifree multipurpose solutions were used, with a high of 18 bottles and low of 2 bottles used, with cost ranging from \$137 to \$15, with an average of \$55 per year. (Fig 2)

Monthly lenses included: Focus, Proclear, Optima FW, Acuvue 2, and Frequency 55.

The monthly contact lenses cost ranged from \$136 to \$84, with an average of \$106 per year. (Fig 3) Multipurpose solutions consisted of Renu, Optifree, and Complete with as many as 13 bottles and as low as 5 bottles used and a cost ranging from \$105 to \$30, with an average of \$67 per year. (Fig 4)

The average total cost of two-week contact lenses with solution was \$224 per year. The average total cost of monthly contact lenses with solution was \$173 per year. Daily contact lenses studied included Acuvue 2 and Focus lenses with an average cost of \$498 per year. (Fig 5)

### **Discussion**

From the data collected, monthly lenses were found to be the least expensive. Despite the fact that Acuvue 2 is not considered as a standard monthly lens, it is the most cost effective. When not considering the Acuvue 2 lens as the least expensive, then Frequency 55 would be next. The two-week lens that is least expensive is Optima FW, and the most expensive lens is the Extreme H<sub>2</sub>O, probably due to the fact that it is not available on line.

One major difference between this study and Dr. Mai-Le's is the lens care regimen. Dr. Mai-Le's research showed that daily contact lenses were the least expensive.<sup>8</sup> This is likely due to the fact that, Dr. Mai-Le's research had patients follow the solution package insert instructions for contact lenses care. This study did not emphasize lens care regimen nor regulate proper usage amount. In addition to the aspect of solution cost and usage, this study also showed that patients use less solution than the FDA recommended amount. Also, a study done by Dr. Sheard, which evaluated the actual usage compared to the estimated amount, found that less saline and protein remover were used.<sup>10</sup> There were no differences found in the amount of solution used when considering no rub as compared to rubbing.<sup>7</sup> Even with no rub, the contact lenses still need to be

rinsed, while rubbing requires both cleaning and rinsing.<sup>7</sup> However, less time is required for no rub. With no rub solutions, lenses can quickly develop more deposits, resulting in removal of the lenses and more frequent cleaning.<sup>9</sup>

Several articles suggest poor patient compliance in terms of both the wearing schedule and the lens care. Many practitioners believe that the population is divided into thirds in terms of compliance, with one third being compliant, one third somewhat compliant, and one third non compliant.<sup>6</sup> A recent survey of current recommendations and practice regarding soft lens replacement and disinfection, concluded that patients tend to wear their lenses longer and dispose of them less frequently than what was recommended by the practitioner.<sup>3</sup> Only 50% of patients rub their lenses.<sup>1</sup>

Noncompliance with contact lens care includes not using the recommended solution, improper use of the solution such as not properly cleaning or rinsing the contact lenses, the infrequent use of solution, and the continuing use of solutions after the expiration date.<sup>5</sup> Noncompliance by patients includes extending the proper wearing schedule and infrequently replacing the lenses.<sup>5</sup> There are various ways of increasing patient's compliance including written, oral, and visual demonstrations on proper contact lens wearing schedules and cleaning regimens.<sup>5</sup> Even though several articles suggest the non compliance issue, Dr. Sheard found the expense of solution did not affect the level of compliance.<sup>10</sup> This study showed that monthly lenses are the least expensive considering the fact that the majority of subjects did not use the proper amount of solution to clean their lenses.

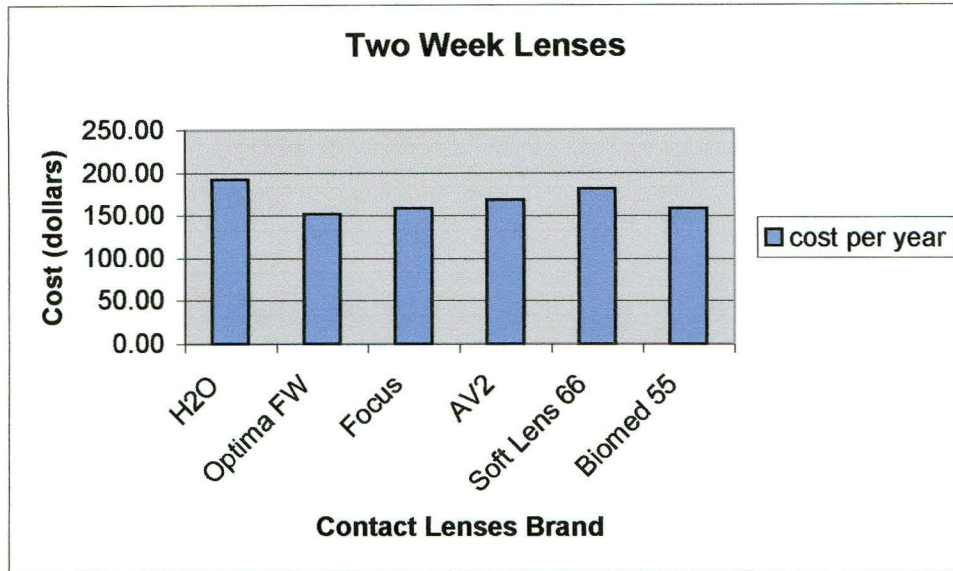


Figure 1

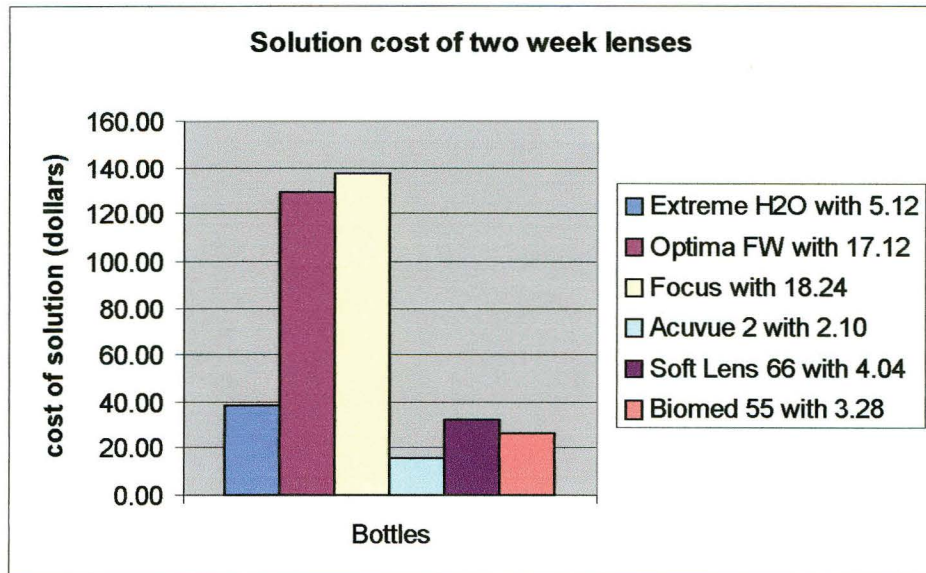


Figure 2

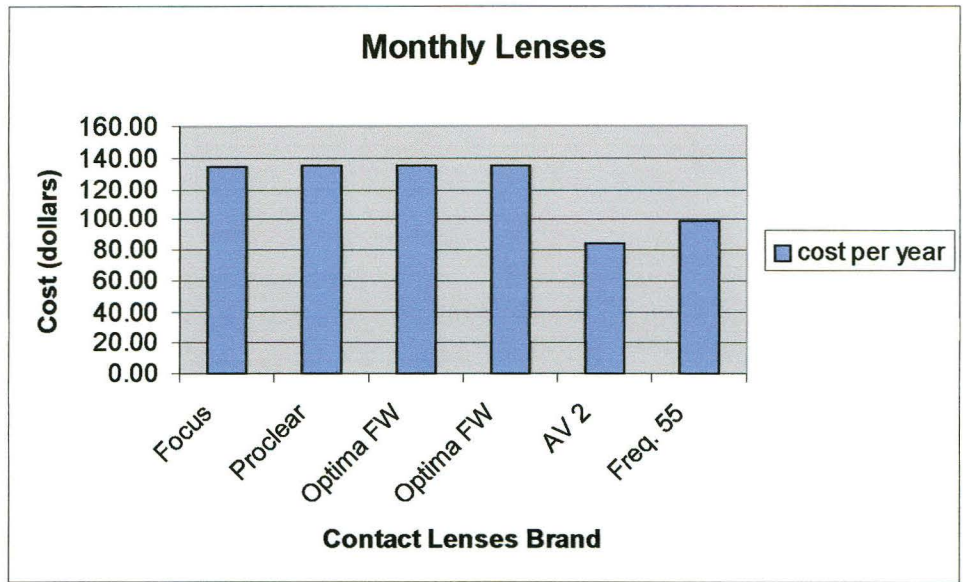


Figure 3

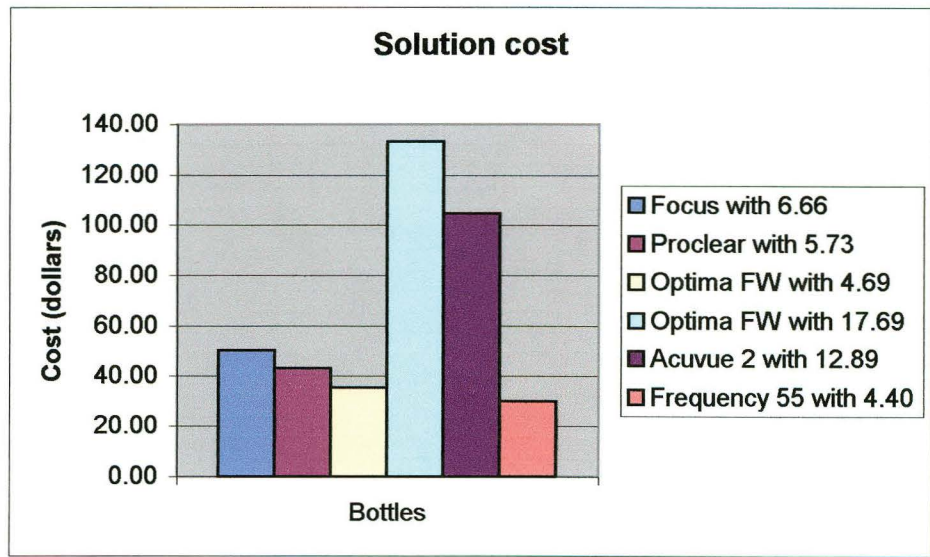


Figure 4

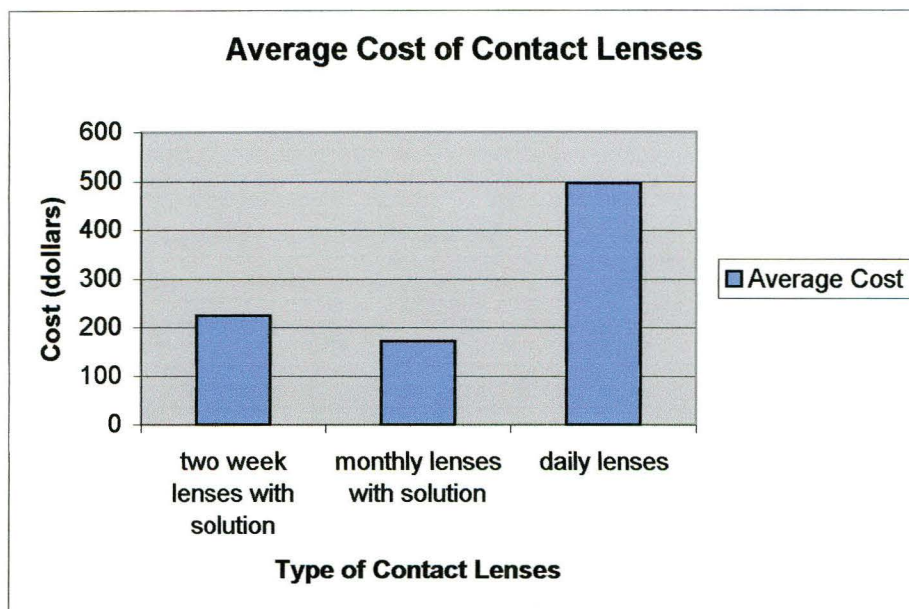


Figure 5



## References:

1. Barr JT. Contact Lens Solutions and Lens Care Update. Contact Lens Spectrum. June 2001. cited January 17, 2003 at [www.clspectrum.com/archive](http://www.clspectrum.com/archive)
2. Caroline PJ, Andre MP. The Cost of Solution-induced Dry Eyes. Contact Lens Spectrum. June 2001. cited January 13, 2003 at [www.clspectrum.com/archive](http://www.clspectrum.com/archive)
3. Coopersmith L, Weinstock FJ. Current recommendations and practice regarding soft lens replacement and disinfection. CLAO J. 1997 Jul;23(3):148 cited January 13, 2003 at [www.ncbi.nlm.gov](http://www.ncbi.nlm.gov)
4. Edrington TB, Barr JT. What's the Solution? Contact Lens Spectrum. March 2002. cited January 17, 2003 at [www.clspectrum.com/archive](http://www.clspectrum.com/archive)
5. Gleason WJ. Contact Lens Regulations and Compliance. May 1999. cited January 17, 2003 at [www.clspectrum.com/archive](http://www.clspectrum.com/archive)
6. Jo Stiegemeier M. No-Rub's the World. Optometric Management. March 2001. cited January 17, 2003 at [www.optometric.com](http://www.optometric.com)
7. Johnson C, Kohler N, Bean B, Caroline P, Smyth J. Rub vs. No Rub: What are the cost? Contact lens Spectrum 2002 Jul:24-30.
8. Mai-Le, Caroline P. Extended wear and Daily Disposable. Contact Lens Spectrum 2001 Jul: 31-41.
9. Rodemich K. The Next Step in Contact Lens Care. Optometric Management. November 2001. cited January 17, 2003 at [www.optometric.com](http://www.optometric.com)
10. Sheard GM, Efron N, Claydon BE. Does solution cost affect compliance among contact lens wearers? Journal of the British Contact Lenses Association. 06/01/1995, 18(2) p59-64.