

# Wearers, Prices, and Sources of Payment

## WEARERS OF CONTACT LENSES

“Disorders of refraction and accommodation, ” according to the U.S. Public Health Service, ranked 14th among the 20 most common reasons for visiting a physician but accounted for only 1.4 percent of all visits to non-Federal, office-based physicians in 1981 (52). Unlike other diagnostic categories, however, refractive examinations and corrective-lens prescribing and fitting can be obtained from eye-care professionals other than physicians (i. e., optometrists and, in *some* States, opticians). In fact, optometrists represent about two-thirds of those professionals legally permitted to examine eyes and prescribe corrective lenses, and they prescribe approximately three-fourths of all corrective lenses and 60 percent of all contact lenses (5,12). If all such eye care were provided by ophthalmologists, refractive disorders would rank among the top three reasons for visiting a physician, either closely following hypertension and normal pregnancy or leading them, depending on the adjustment factor chosen. Accordingly, it is not surprising that over half of the population 3 years old and above wear corrective lenses and that about 15 million persons wear contact lenses.

In table 5, data from three National Health Survey studies of corrective lens wearers are presented. These data, for 1965-66, 1971, and 1979-80, show some interesting patterns and trends among users. In each of the study periods, contact lens wearing was at least twice as prevalent among females, overall, as among males. Further, lens wearing is most common among young adults, tapering to low levels at middle age and beyond. This pattern is almost totally the opposite of the age-related frequency of use of eyeglasses. (However, in 1979-80, lens wearing in the 65 and over group, both males and females, rose sharply.) Third, over the covered period, lens wearing increased at every age level for both males and females. Thus, the general view of contact lenses as primarily a “younger female” product has sub-

**Table 5.—Contact Lens Wearers, Percent of Population, by Sex and Age, 1965-66, 1971, and 1979-80**

Sex and age group	Percent of population 3 years and over wearing contact lenses		
	1965-66	1971	1979-80
<b>Both sexes:</b>			
All ages, 3 and over. . . . .	1.0	2.1	4.5
3-16 . . . . .	0.3	0.6	1.0
17-24 . . . . .	3.7	6.6	9.4
25-44 . . . . .	1.3	3.0	7.7
45-54 . . . . .	0.4	0.7	2.1
55-64 . . . . .	0.3	0.7	1.6
65 and over . . . . .	—	0.7	4.3
<b>Male:</b>			
All ages, 3 and over. . . . .	0.6	1.2	2.8
3-16 . . . . .	—	0.3	0.6
17-24 . . . . .	2.0	3.4	5.3
25-44 . . . . .	0.9	1.8	4.4
45-54 . . . . .	0.3	0.5	1.4
55-64 . . . . .	—	0.7	1.4
65 and over . . . . .	—	0.7	4.6
<b>Female:</b>			
All ages, 3 and over. . . . .	1.3	2.9	6.2
3-16 . . . . .	0.4	0.9	1.5
17-24 . . . . .	5.2	9.5	13.3
25-44 . . . . .	1.7	4.2	10.7
45-54 . . . . .	0.5	0.9	2.7
55-64 . . . . .	—	0.6	1.9
65 and over . . . . .	—	0.7	4.0

**SOURCES:** 1965-66: U.S. Department of Health, Education, and Welfare, *Characteristics of Persons With Corrective Lenses, United States July 1965-June 1966*, Vital and Health Statistics, series 10, No. 53, prepared by M. M. Hannaford, DHEW publication No. (PHS) 1000 (Washington, DC: US. Government Printing Office, June 1969) 1971: U.S. Department of Health, Education, and Welfare, *Characteristics of Persons With Corrective Lenses, United States: 1971*, Vital and Health Statistics, series 10, No. 93, prepared by M. H. Wilder, DHEW publication no. (HRA) 75-1520, Washington, DC, 1974. 1979-80: R. Hollander, U.S. Department of Health and Human Services, Public Health Service, Rockville, MD, personal communication, June 30, 1983.

stantial validity, but the pattern presently is changing in substantial ways and will be considerably different in the future. The current changes, particularly the increasing use of contact lenses by older persons, are attributable to younger lens wearers' moving through the age spectrum; the development of newer types of bifocal and toric lenses, which relate especially to the vision problems of older persons; and the

growth in soft and extended-wear lenses, which particularly help older persons, whose eyes are less accommodating to contact lenses than are those of younger persons. Further, differences in the rates of lens usage by women and men are narrowing, and in new fits the differences will soon be eliminated. Accordingly, the lens market will no longer be dominated by the young adult female wearer; the traditional patient base will expand widely; and all groups except perhaps children will become important users.

Although as large a part of the population with vision correction suffers from presbyopia as from single-vision problems, lens wearing is much more prevalent among the latter group. As lenses for all users improve, the greatest relative growth will be for presbyopes and astigmatic, but contact lenses will continue to be prescribed most frequently for single-vision problems. Within the single-vision category, about 60 percent have myopia, 40 percent hyperopia. In addition, the relative use of contact lenses for those with myopia runs somewhat higher than among those with hyperopia. Therefore, at least through the 1980s, the largest absolute volume of sales will continue to be for the correction of myopia, followed by hyperopia, with presbyopic use gaining quickly and perhaps passing hyperopia before the 1980s have ended.

Additional data from the National Health Expenditures Survey (51) show contact lens use to be relatively more common in suburban than rural or inner-city areas, among whites than non-whites (particularly blacks and Hispanics), and also to be positively associated with the educational level of the family head. All of these correlations are explainable in terms of the higher income levels among suburban residents, whites, and the more educated. (Other features in the pattern of contact lens use show that lenses are more often worn by white-collar and service workers than by blue-collar or farm workers. These differences may also be explainable in part by income differentials, but probably more so by the greater proportion of women employed in the white-collar and service sectors, and perhaps also by the actual physical conditions of each type of work.) In other words, contact lenses are a "normal" economic good, with purchases expanding

as income expands, or in economists' parlance, with a positive income elasticity of demand.

Data from the National Center for Health Services Research's National Health Expenditures Study (table 6) shed a bit more light on the income elasticity of demand for contact lenses. (The income elasticity of demand measures the relationship between changes in income and the resulting changes in the number of units purchased.) If we were to assume average incomes within the three classes to be \$6,000, \$18,000, and \$30,000 respectively, with all other characteristics showing similar patterns among income classes, then the income elasticity would be approximately 0.13 to 0.27, which is a plausible range of estimation. (An income elasticity of demand of 0.13 means that a 1-percent increase [decrease] in income causes a 0.13 of 1-percent increase [decrease] in units [pairs of contact lenses] purchased.)

Although no measurement or estimation is made here of the price elasticity or cross elasticity of demand (defined as the effects on lens purchases of changes in the price of lenses and of changes in the price of other goods, particularly eyeglasses, respectively) for contact lenses, certain relationships may be suggested on the basis of recent experience. First, the demand for lenses seems to be at least somewhat sensitive to changes in the relative price of lenses in that wearers of eyeglasses frequently specify cost as one of their reasons for not switching to lenses. (Theoretically, if the demand for a product is sensitive to changes in income levels, it also is sensitive to price changes of that product. The connection between the two is the so-called "income effect" of the price change.)

**Table 6.—Purchase or Repair of Contact Lenses per 1,000 Population at Different Family Income Levels, 1977**

Family income	Persons with purchase or repair of contact lenses
Less than \$12,000 . . . . .	0.9
\$12,000 to \$19,999 . . . . .	1.1
\$20,000 or more . . . . .	1.4

SOURCE: U.S. Department of Health and Human Services, Public Health Service, National Center for Health Statistics, 1981 Summary: *National Ambulatory Medical Care Survey*, NCHS Advance data, prepared by L. Lawrence and T. McLemore, No. 66, Hyattsville, MD, Mar. 16 1963.

Second, through time, new developments in both contact lenses and eyeglasses may have narrowed the qualitative differences between the two types of corrective lenses, leaving the remaining differences, including price, as relatively more important bases of choice than previously was the case. For example, lenses may be bought because wearers “look better” than if they were wearing eyeglasses. However, the emphasis on “fashion eyewear” has made the wearing of eyeglasses, particularly among males, considerably more acceptable. Other qualitative advantages of contact lenses may have been offset by improvements in eyeglasses: the lightness of contact lenses have been offset somewhat by the popularity of light, plastic lenses for eyeglasses; tinted contact lenses are matched by “prescription sunglasses” and photo-chromic spectacle lenses; both contact and eyeglass lenses are available in bifocal and multifocal modes; new sports goggles have eliminated

the safety advantage of contact lenses in activities where spectacle frames and lenses have posed a problem; new eyeglass lenses of plastic on the inside, for safety, and glass on the outside, for durability, have just been introduced.

Thus, although the price level of corrective eyewear as a whole determines the affordability of obtaining vision correction, the price structure of corrective eyewear (the magnitude of the differential between the price of contact lenses and that of eyeglasses) appears to be influential in the choice between the two alternatives. Here again, recent events seem favorable for long-term growth in contact lens usage, because prices for lens fitting have dropped significantly and are likely to continue to compare favorably with eyeglass prices. (Causes of these price declines will be identified in the next section of this chapter.)

## PRICES

In 1980, consumers spent an estimated \$700 million on contact lenses, lens-care products, and professional services (23). In view of the significant growth in contact lens usage, this dollar figure would have been much higher had it not been for the notable price declines of the late 1970s, which have continued into the 1980s.

These declines are exemplified by the data in table 7, which show soft-lens list prices to the practitioner and total fitting prices, including lenses, for selected years from 1971 to 1982. Soft-lens prices fell by over 50 percent during this

period. Total fitting prices have also fallen, reflecting in part the effects of the fall in the price of the lens component of the total price. Despite the high rates of general and medical price inflation during this period, which would have more than offset lens price declines, there were also strong competitive forces at work within and between the various categories of fitters which kept total prices stable or declining. Thus, contact lens and total fitting prices have experienced large reductions despite high inflation. Although price trends for gas-permeable lenses are still too early to trace, two forces running counter to each other

**Table 7.—Average Soft Contact Lens List and Total Fitting Prices, per Pair, 1971-82, Selected Years**

	1971-74	1975	1980	1981	1982
List price <sup>a</sup> . . . . .	\$65.00	\$68.70	\$50.00	\$40.00	\$30.00
Total fitting price: <sup>a</sup>					
Ophthalmologist . . . . .	\$500-600	\$250-325	\$250-300	\$250-300	\$250-300
Optometrist . . . . .	300-350	400	250	225	225
Optical outlet . . . . .	—	—	170	150-170	125
Large chain . . . . .				120	100
Independent . . . . .				178	160

<sup>a</sup>Prices are higher for extended-wear soft Contact lenses.

SOURCES: L. Schwarz and D. K. Temple, *Contact Lens Industry-The Shakeout Continues* (New York: Salomon Bros., Inc., 1983); and M. Carr, Health Products Research, Inc., Somerville, NJ, personal communication, July 7, 1983.

will determine that trend. First, the early dominance of Syntex in the PMMA-silicone lens field has given it an established position much like that of Bausch & Lomb in the first years of soft lenses. Without serious competition in PMMA-silicone lenses, Syntex has avoided direct price competitive moves by close rivals. (However, although Bausch & Lomb was the only seller of soft lenses for 3 or 4 years, Syntex must take heed, at least to some extent, of the prior presence of three cellulose acetate butyrate (CAB) lenses in the gas-permeable market.) On the other hand, gas-permeable lenses represent replacements for hard PMMA lenses and alternatives to soft lenses. Both of these other types of lenses have experienced sharp price reductions as the number of sellers has grown, excess production capacity has emerged, and cost-reducing production methods have been developed. In fact, wholesale hard lens prices ran less than \$10 a pair in 1982 (10), and total fitting costs were, on average, 30 percent lower than for other lens types.

The prospects are strong that future price declines will be a common event in the markets, if

economic forces are free to manifest themselves. While empirical verification is lacking, it may well be the case that there are no substantial economies of scale in research or manufacturing, since smaller firms show impressive records in product and process discoveries, improvements, and implementation. The economic barriers to entry are low, with capital requirements relatively modest, the necessary inputs widely available, and with few important patent barriers. And an informed group of buyers (practitioners) serve to mitigate, at least somewhat, the effects of excessive or flamboyant promotional rivalry. Accordingly, many rivals, of small but efficient size, with abundant research and production capacity, seem ready to promote technological progress, efficient production, and competitive pricing. However, there are several threats to this competitive state of affairs, particularly the regulatory barrier to entry, in the form of a costly and sometimes long approval process before widespread marketing of a lens is permitted by the Food and Drug Administration (FDA). (The matter of FDA approval is examined in ch. 7.)

## SOURCES OF PAYMENT

Consideration of how the yearly \$700 million expenditure for contact lenses, lens-care products, and fitting services is paid for raises two questions: first, what are the sources of payment funds, and second, does the payment pattern, specifically the share from Federal program sources, exert a feedback influence on the quantity of demand for the covered goods and services.

The three main sources of funds for health care expenditures are family out-of-pocket payment, private insurance, and government. These three sources can also be separated by the distinction between "private" and "public" sources, with family out-of-pocket and private insurance grouped together as private and government classified as public; and also by the distinction between out-of-pocket and "third-party," which includes both private insurance and government.

For all personal health care expenditures as a whole, 33 percent is paid out-of-pocket, almost

27 percent by private insurers, and 40 percent by government. Thus, the payment mix is 60 percent private/40 percent public and 33 percent out-of-pocket/67 percent third-party in origin (57).

Among the different components of personal health care the proportions vary considerably. For example, in 1981 the range, using the private/public distinction, went from 44 percent private/56 percent public for nursing home care to 96 percent private/4 percent public for dentists' services. For the out-of-pocket v. third-party distinction, the range went from 11 percent out-of-pocket/89 percent third-party for hospital care to 82 percent out-of-pocket/18 percent third-party for eyeglasses and other medical appliances. Thus, contact lenses are in a group of products with the lowest proportion of payment by third-party sources. In terms of private v. public sources, they are close to dentists' services for the lowest proportion of payments by government, with 10 percent (57).

If third parties as a whole and government in particular play relatively small roles in financing “eyeglass and appliance” purchases, those roles are even smaller in the case of contact lenses. In terms of private insurance, for example, one large survey of employer-provided health-care plans covering 21.8 million workers showed that only 3.6 million were covered for vision-care, including examinations, refractions, and eyeglass lenses and frames. When there is vision-care insurance, the study found, contact lenses may be included. Thus, private insurance for vision-care expenses applied to only 16.5 percent of the workers in this study, and coverage for contact lenses was narrower and shallower, geared mainly to the cost of eyeglasses (57).

Government programs that pay for personal health care are numerous, and include Medicare and Medicaid; the Civilian Hospital and Ambulatory Medical Program of the Uniformed Services (CHAMPUS); the Civilian Hospital and Ambulatory Medical Program of the Veterans Administration (CHAMPVA); the Veterans Administration; the military; the Indian Health Service; and other Federal, State, county, and city payers (51). All these sources together represent, as indicated, 10 percent of the payment for eyeglasses and appliances, and about 8 percent of the annual expenditures for purchases and repairs of “vision aids” (51). Little, if any, authorization exists for the provision of funds for contact lenses. Medicare, the main Federal health financing program for elderly or disabled people, pays only for lenses for therapeutic use, and most of these lenses are connected with cataract removal (4), for which intraocular lenses are increasingly being used.

Considerably less is known about the 55 separate Medicaid programs, which are jointly funded by the Federal Government and the States or territories. A review of the overall Medicaid enabling legislation makes no mention of contact lenses.

Therefore, public sector outlays, while covering many millions of eligible recipients, are apparently not available for a very large majority of all contact lens purchases (4,49,54).

The result of the limited applicability of both private and public third-party arrangements is that an estimated 84 percent of all vision-aid costs are funded out-of-pocket. Of the 16 percent that is covered, more of it appears to be provided by private sources than government. Therefore, if third-party payments increase health care utilization over that occurring in a market where all payment is out-of-pocket, such effects are likely to be relatively small for contact lenses. The role of government in inducing greater demand is smaller still, since government plays a lesser role than private insurers, and that role, such as it is, is limited to a small part of the current patient population.

Further, if resources are not drawn into the development and manufacture of contact lens due to expanded utilization levels, then resource allocation to this industry has suffered relative to other medical technologies, which are more broadly covered by insurance. It is, of course, possible that developments in contact lenses would have been even more pronounced with insurance coverage comparable to that which has been available to pay for other medical technologies. Yet the performance level of the contact lens industry seems not to have been affected adversely; its record of innovation, quality improvement, and price reduction is impressive when compared to most other medical goods and services. Perhaps the explanation for this apparent paradox is to be found in the fact that, unlike other medical technologies, contact lenses are a consumer-oriented product, sold in a market setting where the buyer-seller relationships emphasize rivalry in three important dimensions: innovation, quality, and price.