

# The Contraceptive Implant and the Injectable: A Comparison of Costs

By John M. Westfall and Deborah S. Main

*A comparison of the relative costs of the injectable contraceptive (depot medroxyprogesterone acetate) and the hormonal implant (Norplant®) indicates that the implant is a less costly contraceptive option when it is used for its full five-year lifespan. Over a five-year period, the implant costs \$107 annually, compared with \$140 per year for the injectable. However, if a woman discontinues the implant before she has used it for at least four years, the injectable becomes the less costly option. Relatively high continuation rates—around 95% annually—are necessary to make the implant the more cost-effective contraceptive method.*

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Introduced into the United States in 1991, the hormonal implant (marketed under the brand name Norplant®) offers reversible long-term contraceptive protection for five years, with failure rates similar to those associated with surgical sterilization. In addition, the implant all but eliminates the issue of adherence to a contraceptive regimen. Sexually active users are protected against pregnancy for as long as the implant is in place,<sup>1</sup> with no threat of inadvertent pregnancy as a result of forgetting to take or use the method.

Despite side effects associated with changes in menstruation<sup>2</sup> and the high initial cost, most clinical research has been favorable to the use and continuation of the implant. As the public became aware of this method, its initial reaction to the implant was also favorable. One national survey of U.S. women reported that nearly one-third of the sample intended to use an implant in the future.<sup>3</sup>

More recently, the injectable contraceptive depot medroxyprogesterone acetate (marketed as Depo-Provera) was approved as a contraceptive in the United States. Used worldwide for over 20 years, this method consists of an injection that effectively prevents pregnancy for three months; users must return every three months for their next injection.<sup>4</sup> Like the

implant, the injectable is highly effective, is coitus-independent and does not require daily administration. Its major side effect, disruption of the menses, is similar to that of the implant.<sup>5</sup>

Both the implant and the injectable offer new long-term contraceptive choices, are not coitus-dependent and do not require daily compliance. However, recent data on implant continuation rates indicate that large numbers of women return for early removal of their implant. International studies report five-year continuation rates varying between 41% and 78%.<sup>6</sup> In another study, the average duration of use of the implant among women who stopped practicing contraception because they desired a pregnancy was 33.6 months.<sup>7</sup> One study reported a mean duration of use of just 26.5 months in a group of women requesting removal,<sup>8</sup> and early studies in the United States reported two-year continuation rates of just 40%–65%.<sup>9</sup> More recent preliminary studies in the United States reported one-year discontinuation rates ranging from 78% to 13%,<sup>10</sup> which appear to be consistent with previous international reports.

These early discontinuation rates raise questions about whether the implant's high cost (greater than \$500) is offset by its likelihood of long-term use. When the implant is removed prior to five years, its per-year cost rises. The magnitude of this cost shift could have major implications for contraceptive choices by women, and for health care costs in general. More than \$60 million

was spent on the implant in 1993, with nearly 90% of this total funded by federal subsidies such as Title XIX and Title X.<sup>11</sup>

In this article, we seek to compare the costs associated with implant use and injectable use, after taking into account rates of early discontinuation for the implant. These estimates may help practitioners discuss options for effective long-term contraceptive choices with women desiring reversible contraception, and will highlight the public health costs associated with financing different long-term contraceptive methods.

## Methodology

We calculated per-year costs for the implant using both published and theoretical yearly continuation rates. Woman-years of contraceptive use were then calculated to project the costs for a theoretical cohort of 100 women, and these costs were compared to the cost of the injectable. When calculating the number of woman-years of contraceptive use based on discontinuation rates, we used the number of women relying on that method of contraception at the end of the year. For example, at an annual discontinuation rate of 10%, after one year there would be 90 woman-years of use; in the fifth year, there would be 50, for a cumulative total of 270 woman-years of use.

The costs for the implant were based on Current Procedural Terminology<sup>12</sup> codes 11975 and 11976 and on Colorado Medicaid reimbursement rates for these two codes (\$433.25 for an insertion, \$100.29 for a removal). The average Medicaid reimbursement in the United States has been reported to be \$466 for implant insertion and \$90 for removal.<sup>13</sup> Other reports have cited a typical charge of \$600 for implant insertion and removal in a private office in 1991.<sup>14</sup> (The total insertion and removal charge at our family practice office is \$710.) The cost of the injectable was based on

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**Table 1. Initial, five-year and per year costs of hormonal implant use and injectable use**

Type of cost	Implant	Injectable
Initial	\$433	\$35
Five-year*	\$533†	\$700
Per year	\$107	\$140

\*Projected. †Including removal.

Current Procedural Terminology code X5560 and on the Colorado Medicaid reimbursement rate (\$35.19).

Actual office charges are typically higher than the Medicaid reimbursement, however, so the costs reviewed in this analysis represent a low estimate, particularly for the implant. Many insurance companies do not pay for either the injectable or the implant.

## Results

Initial and "best case" five-year costs for the implant and the injectable can be found in Table 1. These costs do not include the initial office visit, routine follow-up visits or yearly examinations. However, the cost of a quarterly office visit is included in the estimate for the injection, even though women are not required to see a physician for each repeat injection.

Given the similar side effect profiles for the methods and current recommendations for follow-up, we estimate that the charges for routine office visits, acute problems and side effects are similar for the implant and the injection. Over the course of five years, the total cost of using the implant would be \$533, while the cost of receiving injections would be \$700; the respective annual costs, then, would be \$107 and \$140.

Figure 1 shows the annual per-woman costs of using the implant and the injectable, by the number of months of use. We can see that the implant is less costly than the injectable only if women use the implant for at least 48 months; when the implant is used for fewer than 48 months, the injectable becomes the less costly option. Three international studies that examined the length of implant use found shorter average durations of use: The longest (37 months) was found in a study conducted in Bangladesh,<sup>15</sup> while a cross-national study showed a mean of 34 months<sup>16</sup> and a smaller study an average of nearly 27 months.<sup>17</sup> Using the discontinuation rates found in these studies, we estimate that the hormonal implant could cost women anywhere from \$50 to \$100 more per year than the injectable.

Figure 2 (page 36) presents estimates, based on the annual per-woman costs, of

providing five years of contraceptive protection for 100 women, using continuation rates of 85–100% for the implant and the injectable. When the annual continuation rate is close to 100%, the five-year cost of the implant for the hypothetical cohort of 100 women appears to be around \$50,000, while the cost of injectable use is approximately \$70,000. Thus, when continuation rates are relatively high, the implant is the more cost-effective option. However, the cost of the implant rises significantly as continuation rates decrease, such that if implant continuation rates fall much below 95%, injectable use becomes more cost-effective. One study found an annual continuation rate for the implant of around 92%,<sup>18</sup> but two others found rates of below 90%.<sup>19</sup>

## Discussion

The implant and the injectable both provide effective long-term contraception. In an era when our nation is struggling to control health care costs, it is important to consider the long-term costs of common therapeutic agents.

The best-case costs of the implant and the injectable are similar. However, this quickly changes when we account for contraceptive discontinuation rates. In any instance other than nearly perfect implant use (i.e., continued use for five years), the injectable becomes the cheaper contraceptive option.

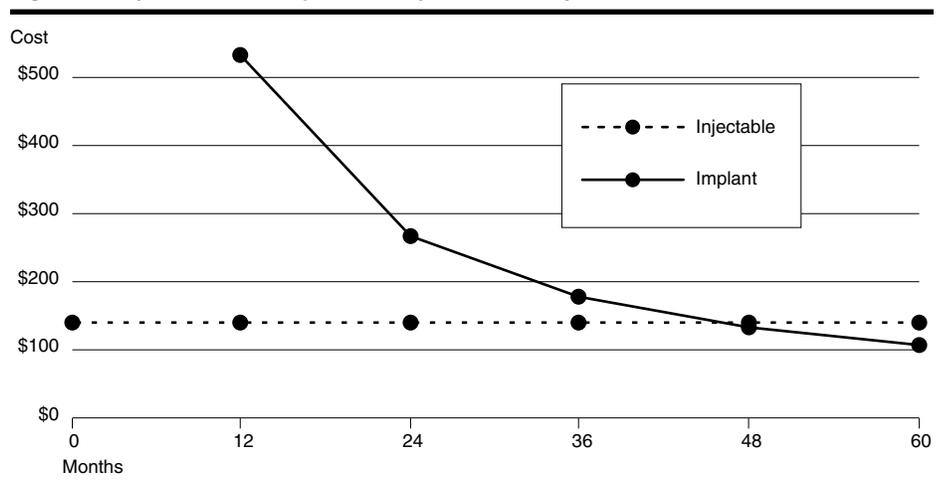
Many reasons have been given for implant discontinuation, the two most important being menstrual irregularity and the desire to become pregnant. Menstrual irregularities have been reported to account for anywhere from 30% to 60% of early discontinuations.<sup>20</sup> Researchers have also reported that nearly 20–25% of early discontinuations are for a desired preg-

nancy.<sup>21</sup> One U.S. study indicated that 63% of implant users were using the method to postpone or space births,<sup>22</sup> and the manufacturer has advertised the implant as a contraceptive suitable for birthspacing. However, many women seeking to practice birthspacing may not want the full five years of contraceptive protection provided by the implant. When fewer than five years of birthspacing are desired, the implant may not be a cost-effective option. Certainly, women should be counseled to choose their contraceptive based on their needs over a full five-year span.

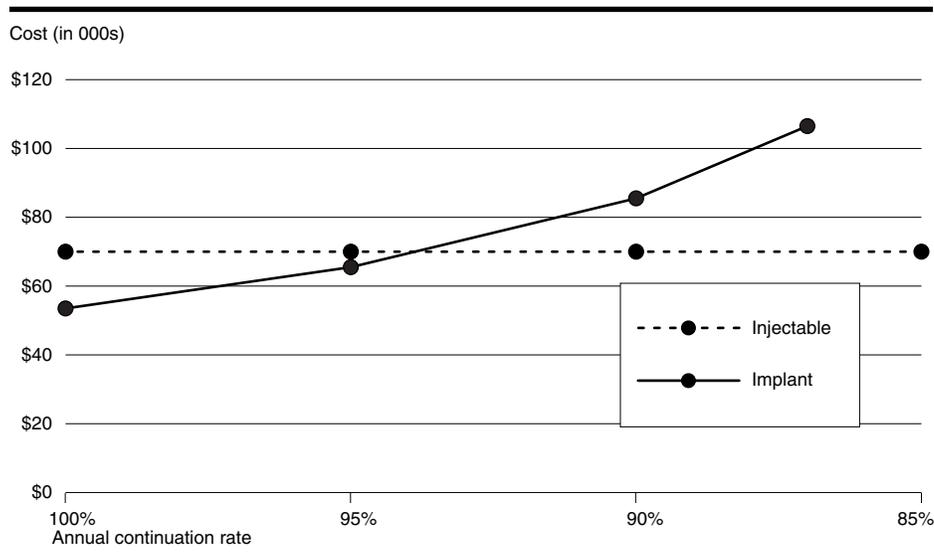
Our estimates of costs are only for years of actual contraceptive use. If the discontinuation rate for the injectable were also high, one would have to include the added costs of some other method of contraception or the costs of subsequent pregnancies. These same considerations apply as well to those who discontinue using the implant early.

Because the intent of this article was to describe briefly how the monetary costs of implant use are affected by discontinuation, we have not included indirect costs in our comparison of the implant and the injectable. The costs of travel and missed work or school, as well as the added inconvenience of making four visits per year to one's health care provider, were not included in this analysis, but these may have an impact on the continued use of the injectable. An important next step is to perform a comprehensive cost analysis that incorporates all costs and benefits associated with the two methods and that discounts to adjust for current and future costs. These costs could then be compared to other, short-term contraceptive options as well. Further research on continuation rates for injectable contraceptives should also help clarify these issues.

**Figure 1. Projected cost of implant and injectable use, by months of use**



**Figure 2. Projected cost (in 000s) of five years of implant and injectable use for a cohort of 100 women, by annual continuation rate**



If the cost of the injectable were to rise, if the cost of the implant were to come down, or if implant continuation rates were to improve, the costs of the two methods would be more comparable. Even if costs and discontinuation rates remain relatively stable, however, creative strategies may be used to provide women with long-term contraception while containing costs. For example, women interested in long-term contraception could use the injectable for 3–6 months to help identify those who can tolerate the method’s side effects and those who cannot. Women who can tolerate the side effects and who are committed to long-term contraceptive use (i.e., five years of use) might then receive the implant. This stepped approach has not received much empirical attention, although it has theoretical appeal. More research in the United States on the continuation rates and the costs of both contraceptive methods will help providers match women seeking reversible contra-

ception with the method best suited to their anticipated duration of use.

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