

Recent Average Price Trends for Implantable Medical Devices, 2007-2011

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Introduction and Summary of Findings

In this study, we examine empirical evidence on reported average price trends for several major categories of implantable medical devices (IMDs) over the period 2007 through 2011.

We find that the reported average price for each type of implantable medical device studied declined during this period, both on a nominal and inflation-adjusted basis. Using the medical care CPI, we calculate the decline in inflation-adjusted prices to be from 17 to 34 percent depending on the device category.

Study Scope and Approach

This study provides recent evidence on trends in reported average selling prices paid for selected categories of IMDs among a sample of up to 294 hospitals for the period 2007 to 2011.

Average pricing data for selected device categories

Average pricing data were obtained from Millennium Research Group, Inc. (MRG), an independent third-party provider of proprietary survey data of average selling prices, for the following seven categories of medical devices:

- cardiac resynchronization therapy defibrillators (CRTDs);
- implantable cardioverter defibrillators (ICDs);
- pacemakers;
- artificial hips;
- artificial knees;
- drug eluting stents; and
- bare metal stents.

The survey included results from 153 to 294 hospitals (depending on the device category and year). The hospital sample is characterized by MRG as nationally representative in terms of the mix of hospital characteristics and geography. The average pricing data are described as

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reflecting net acquisition costs reported by hospitals after accounting for all discounts and rebates.

The pricing data presented summarize *average* prices reported by the sample of hospitals for all models and manufacturers in a given device category, rather than trends for any specific model of device or manufacturer. The reported average prices are sales-weighted across all manufacturers and types of devices (e.g., dual chamber pacemakers vs. single chamber pacemakers) within each selected category for the surveyed hospitals. As a result, factors other than pricing at the specific product level may affect changes in the reported average prices paid over time (either within a given hospital, or over all hospital survey respondents), such as:

- Changes in *product mix* within a given device category over time.

In addition, the reported average selling price reflects trends in the average price of the given device type, rather than trends in the overall, or medical device-related costs to the hospital for a given patient procedure. Factors other than the reported average selling price of the device type may affect hospital device-related costs for a patient procedure, including:

- Changes in the average *intensity of use* per patient procedure over time (e.g., the average number of stents used per patient procedure);
- Changes in the *quality and features* of the products over time (which might be correlated with average prices, and might also lead to corresponding changes in patient outcomes, costs, treatment setting, or other metrics).

To the extent that the device types examined have increased in quality over time and offer improved patient outcomes, the average reported price trends may understate the decline in quality-adjusted real prices. Such developments were outside the scope of our review.

Inflation adjusted prices

To compare expenditure figures on a common basis, all prices were inflated to 2011 real values using the Consumer Price Index for all urban consumers for medical care expenditures (medical care CPI).³ The medical care CPI measures inflation for a market basket of medical care products and services, holding quality and quantity of the products and services constant. Trends in the average reported selling price for selected IMDs adjusting for inflation using the medical care CPI may therefore be compared relative to the trend in the average price of medical care products and service generally. For example, a decline in the reported real average selling price for an IMD would mean that the average cost for devices of that type declined by more than the cost of other medical care items. A sensitivity analysis was conducted using the general CPI for all urban consumers (the CPI-U) and results are presented in Appendix A.⁴ Price trends for the nominal reported average prices prior to inflation adjustments are presented in Appendix B.

³ Bureau of Labor Statistics, Consumer Price Index – All Urban Consumers, Medical Care, Accessed December 20, 2012, from <http://data.bls.gov/pdq/querytool.jsp?survey=cu>.

⁴ Results in Appendix A reflect trends in the reported average prices of IMDs relative to average prices in the economy generally. Results are largely consistent regardless of whether the inflation adjustment is implemented using the medical care CPI or the general CPI for all urban consumers.

Finding: Reported average prices paid for the medical devices reviewed declined from 2007 to 2011 on an inflation-adjusted basis

Reported average device prices declined in each device category over the period 2007 to 2011, on both a real (inflation-adjusted) and nominal basis. Table 1 reports the change in the average selling price for each category of device relative to the 2007 average price and after adjusting for inflation.⁵ Figure 1 presents a corresponding graphical representation. The average selling price for each device category declined in real terms between 2007 and 2011. The size of this decline ranges from a 17 percent decline for artificial knees to a 34 percent decline for drug eluting stents (corresponding to an average annual rate of decline of -4.6 percent and -10.5 percent, respectively).

Table 1
Percentage Change in Reported Average Real Prices by Medical Device Category⁶
2007 to 2011

In Real 2011 Dollars (Adjusted by medical care CPI)

Device category	2007	2008	2009	2010	2011	Total Percentage change
CRTDs	100%	95%	89%	80%	74%	-26%
ICDs	100%	93%	84%	81%	76%	-24%
Pacemakers	100%	90%	83%	78%	74%	-26%
Artificial hips	100%	93%	88%	83%	77%	-23%
Artificial knees	100%	95%	91%	86%	83%	-17%
Drug eluting stents	100%	90%	82%	74%	66%	-34%
Bare metal stents	100%	93%	87%	80%	73%	-27%

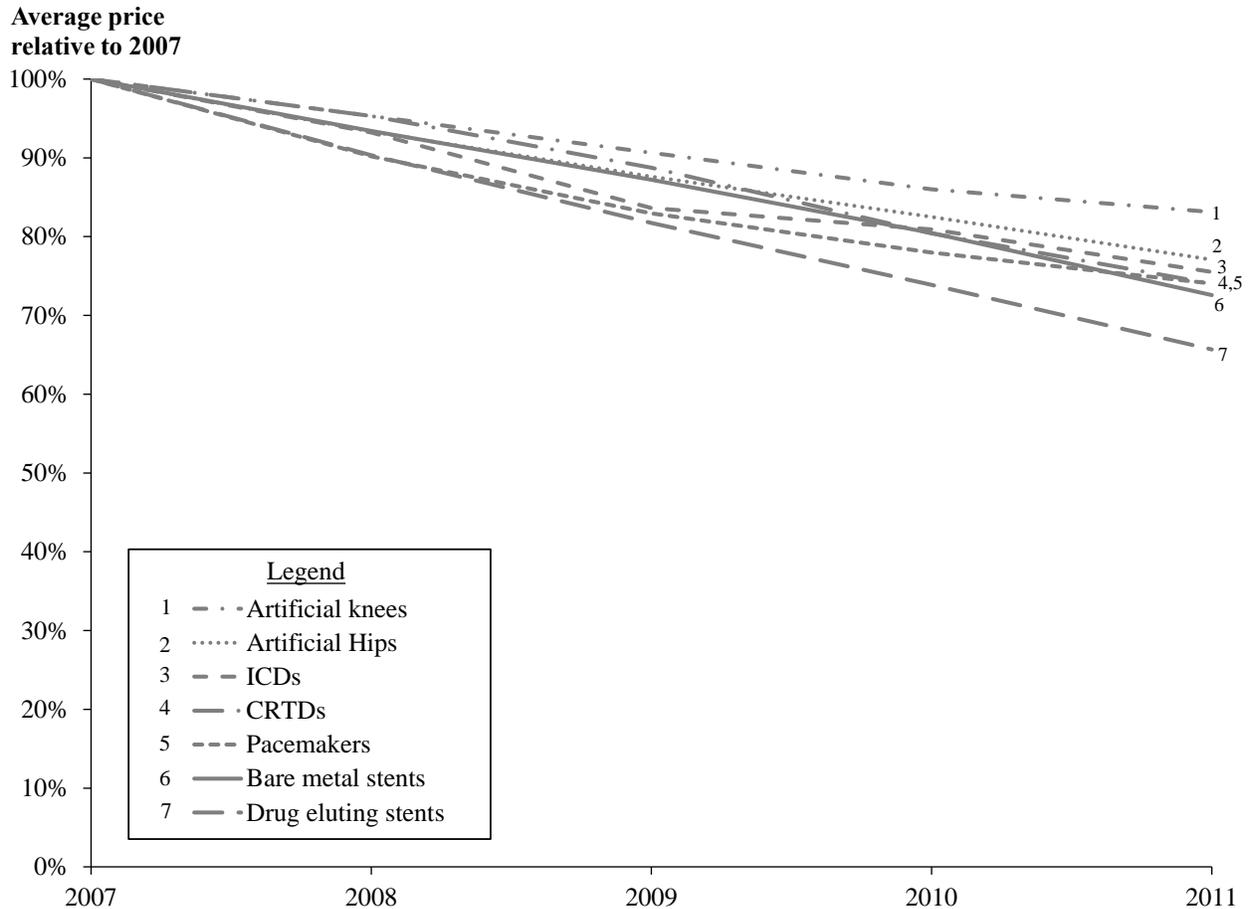
Notes: The device category “Artificial hips” reflects a total hip replacement and is calculated as the sum of the average prices for acetabular liners, acetabular shells femoral heads, and femoral stems. The device category “Artificial knees” reflects a total knee replacement and is calculated as the sum of the average prices for bicondylar femoral components, patella, tibial insert, and tibial tray. Inflation adjusted using the medical care CPI.

⁵ Table 1 utilizes the medical care CPI. Appendix A includes this analysis adjusted by the CPI-U.

⁶ Average price data provided by Millennium Research Group, Inc. (©2012 Millennium Research Group, Inc. All rights reserved. Reproduction, distribution, transmission or publication is prohibited. Reprinted with permission.). Medical care CPI data accessed from the Bureau of Labor Statistics.

Figure 1
Percent Change in Reported Average Real Prices by Medical Device Category⁷
2007 to 2011

In Real 2011 Dollars (Adjusted by medical care CPI)



Data Interpretation

The price trends presented reflect the average reported price paid of the device component examined, as opposed to the average total medical device-related costs for a procedure involving that device.

- The average device price does not reflect changes in the *intensity of use* of the device per patient procedure over time (e.g. any changes in the number of studied devices implanted during a single procedure).

⁷ Average price data provided by Millennium Research Group, Inc. (©2012 Millennium Research Group, Inc. All rights reserved. Reproduction, distribution, transmission or publication is prohibited. Reprinted with permission.). Medical care CPI data accessed from the Bureau of Labor Statistics.

- The average device price reflects changes in *product mix* over time (e.g., as a result of substituting less or more expensive models of devices in the same category as a result of technological advances or purchasing initiatives), rather than the price for a given device from a given manufacturer over time, which may have increased or decreased.
- The average device price does not capture changes in the average *quality or features* of devices in the category over time (or the resulting implications for hospital non-device costs, such as the length of stay or utilization of other resources, or on patient outcomes).

Conclusion

Assuming that the reported pricing data are generally representative of U.S. hospitals and their prices paid, the findings suggest that average prices for implantable medical devices paid by hospitals have declined substantially in recent years on an inflation-adjusted basis.

Appendix A
Trends in Reported Average Device Price
CPI-U Inflation-Adjusted

Table A1 reports the results contained in Table 1, but applies the general CPI-U rather than the medical care CPI to adjust reported IMD average prices.⁸

In general, the CPI-U reflects a slightly lower level of inflation compared to the medical care CPI; however, the findings are generally consistent regardless of whether the inflation adjustment relies on the medical care CPI or the general CPI-U. Reported average price declines are observed for all studied categories of IMDs.

Table A1
Percentage Change in Reported Average Real Prices by Medical Device Category⁹
2007 to 2011

In Real 2011 Dollars (Adjusted by CPI-U)

Device category	2007	2008	2009	2010	2011	Total Percentage change
CRTDs	100%	95%	92%	85%	78%	-22%
ICDs	100%	93%	86%	85%	79%	-21%
Pacemakers	100%	90%	86%	82%	78%	-22%
Artificial hips	100%	93%	91%	87%	81%	-19%
Artificial knees	100%	95%	94%	90%	87%	-13%
Drug eluting stents	100%	90%	85%	78%	69%	-31%
Bare metal stents	100%	93%	90%	85%	76%	-24%

Notes: The device category “Artificial hips” reflects a total hip replacement and is calculated as the sum of the average prices for acetabular liners, acetabular shells femoral heads, and femoral stems. The device category “Artificial knees” reflects a total knee replacement and is calculated as the sum of the average prices for bicondylar femoral components, patella, tibial insert, and tibial tray. Inflation adjusted using the general CPI-U.

⁸ Bureau of Labor Statistics, Consumer Price Index – All Urban Consumer, All Items, Accessed December 20, 2012, from <http://data.bls.gov/pdq/querytool.jsp?survey=cu>.

⁹ Average price data provided by Millennium Research Group, Inc. (©2012 Millennium Research Group, Inc. All rights reserved. Reproduction, distribution, transmission or publication is prohibited. Reprinted with permission.). CPI-U data accessed from the Bureau of Labor Statistics.

Appendix B
Trends in Reported Average Device Price
Nominal Prices

Table B1 reports the results contained in Table 1, but reports the nominal reported IMD average prices prior to any inflation adjustment. Reported average nominal price declines are observed for all categories of IMDs examined.

Table B1
Percentage Change in Reported Average Nominal Prices by Medical Device Category¹⁰
2007 to 2011

In Nominal Dollars (Not Inflation Adjusted)

Device category	2007	2008	2009	2010	2011	Total Percentage change
CRTDs	100%	99%	95%	89%	84%	-16%
ICDs	100%	97%	89%	90%	86%	-14%
Pacemakers	100%	94%	89%	86%	84%	-16%
Artificial hips	100%	97%	94%	91%	88%	-12%
Artificial knees	100%	99%	97%	95%	95%	-5%
Drug eluting stents	100%	94%	87%	82%	75%	-25%
Bare metal stents	100%	97%	93%	89%	83%	-17%

Notes: The device category “Artificial hips” reflects a total hip replacement and is calculated as the sum of the average prices for acetabular liners, acetabular shells femoral heads, and femoral stems. The device category “Artificial knees” reflects a total knee replacement and is calculated as the sum of the average prices for bicondylar femoral components, patella, tibial insert, and tibial tray.

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