

# A COMPARISON OF DIRECT MEDICAL COSTS IN VERTEBROPLASTY AND KYPHOPLASTY IN JAPAN AND IMPLICATIONS FOR IMPACTS ON THE BUDGET

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LESS INVASIVE, LESS EXPENSIVE, AND MORE PATIENT ACCESS IN THE TREATMENT OF VERTEBRAL COMPRESSION FRACTURES

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## Introduction

Up to 100,000 patients with vertebral compression fractures are non-responding to conservative treatment, suffering from prolonged pain and bedridden status in Japan. An increasing number of kyphoplasty under general anesthesia are conducted, with 18,538 cases in 2023, yet leaving most of the indexed population without further intervention.

## Objective

This study compared the direct medical costs of vertebroplasty, a local-anesthesia procedure newly added to the national listing in Japan, and kyphoplasty, the current standard of care performed under general anesthesia, and estimated their impact on the overall national budget.

## Methods

1 Inpatient medical costs were accounted for in a kyphoplasty and a vertebroplasty case using the Year 2021 tariff of technical fees for all standard treatments and care

2 A commercial mixture of prescribed drugs obtained from the 10th NDB Open data (Year 2021)

3 CAGR 14.5%, the same trend as that for kyphoplasty was assumed for vertebroplasty to estimate the peak annual number of cases, as these two procedures had quite similar regulatory restrictions in the work-ups of a new institution

4 Cost reductions were calculated per case by comparing kyphoplasty and vertebroplasty

5 Cumulative annual costs were estimated using the simulated peak number of cases for each procedure.

The expected impact was obtained as with and without introduction of vertebroplasty over the current practice.

## Reference

- 1) 10th National Open Database (NDB); <https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/0000177182.html>. (accessed 2024 Dec.23)
- 2) Japan National Sensus annual update; <https://www.mhlw.go.jp/toukei/saikin/hw/jinkou/kakutei22/>. (accessed 2024 Dec.23)

## Acknowledgements

This study was sponsored by Technology and Research Japan K. K., the marketing approval holder of the vertebroplasty kit under the national reimbursement listing. Methodological advice was obtained from a former MHLW officer, Mr. Toshihiro Tanaka, and the adequacy of clinical settings in the simulation was reviewed by Dr. Yasuaki Arai, the former President of the National Cancer Center in Tokyo.

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## Introduction

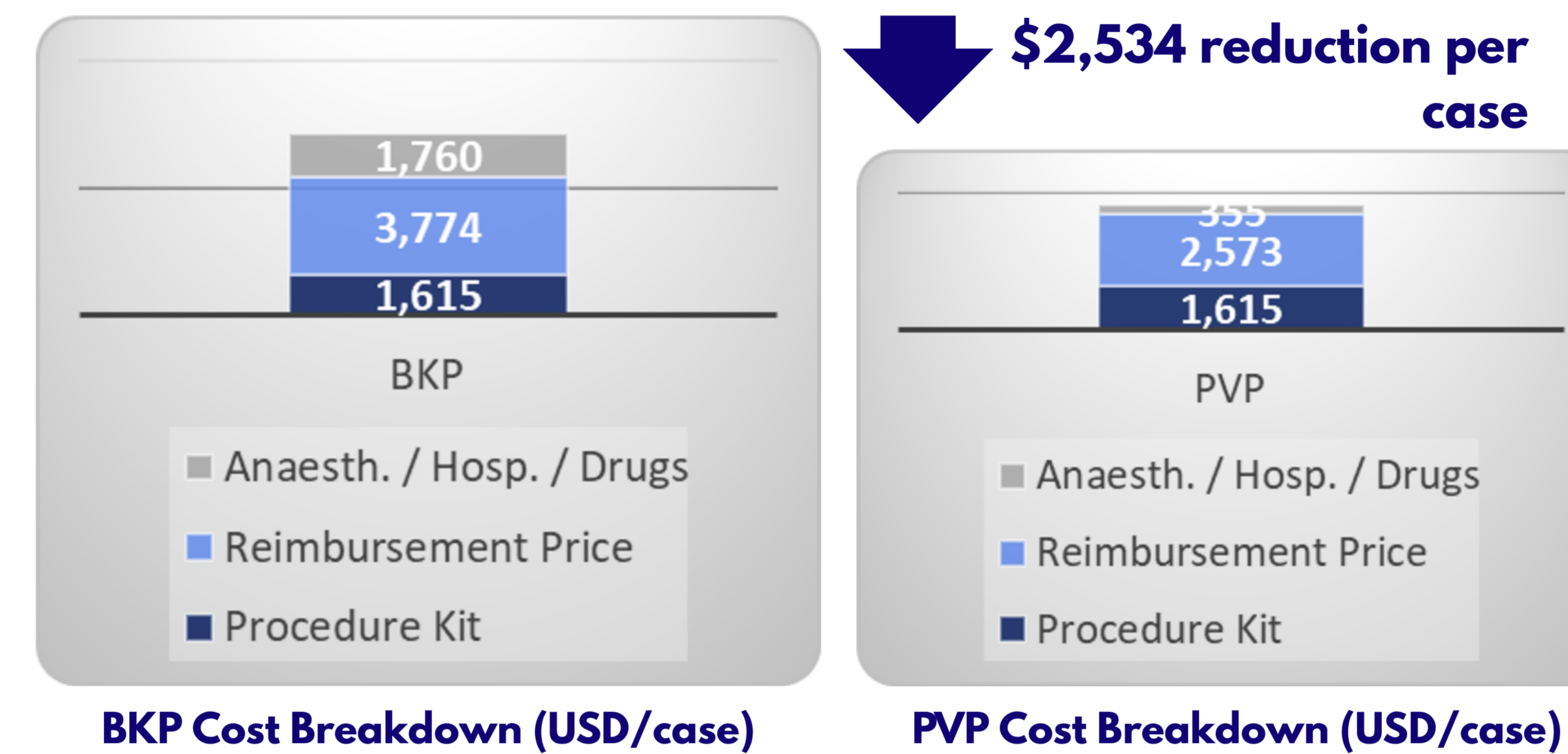


Fig. 1 Cost Simulation Per Case



Fig. 2 Net Financial Impact : New PVP Cases

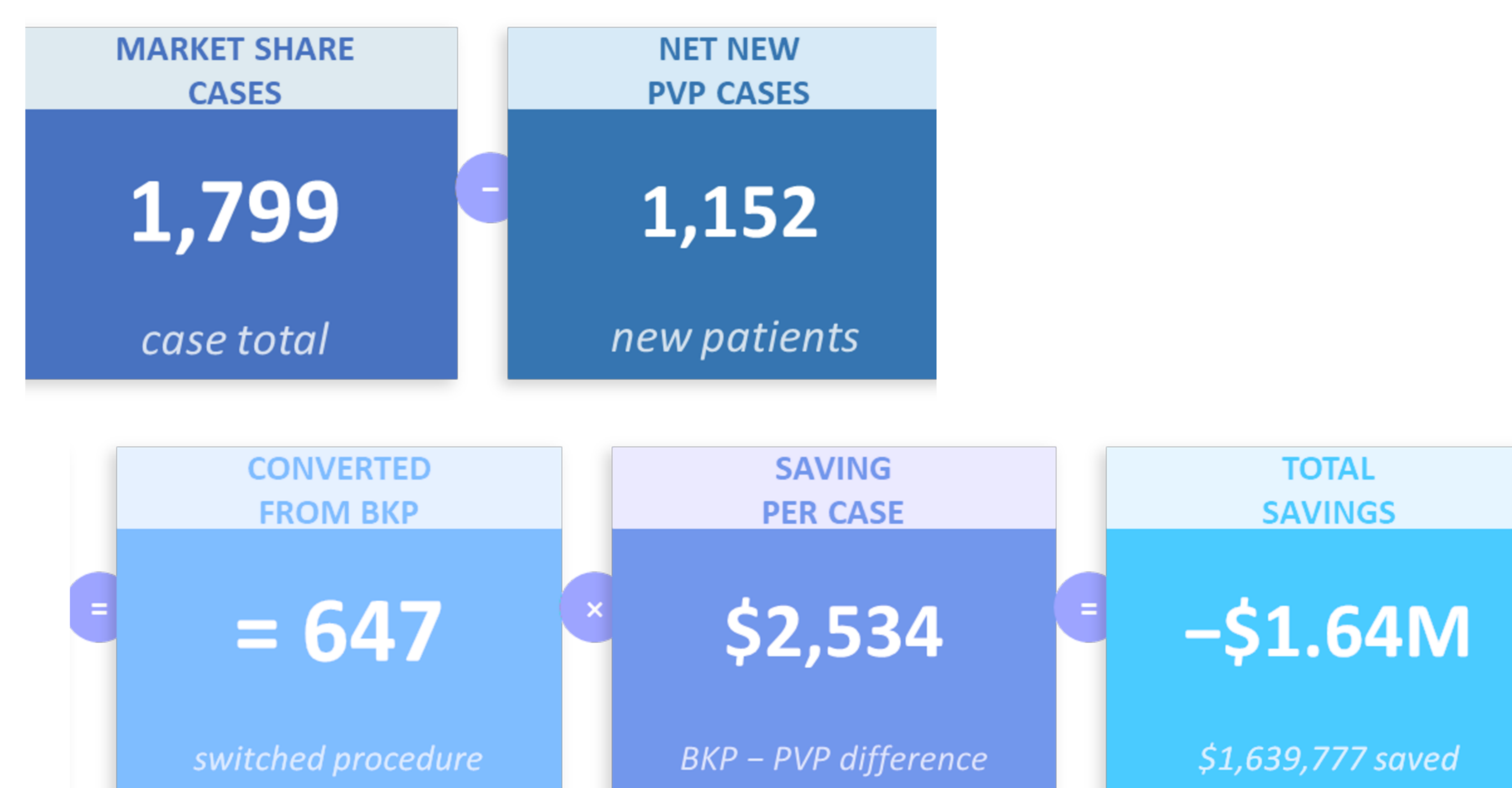


Fig. 3 Net Saving : Conversion from BKP to PVP

## Results

Direct medical costs were reduced by 2,534 USD per case (7,149 USD in kyphoplasty vs. 4,614 USD in vertebroplasty).

The reduction was primarily due to the change in anesthetization, hospitalization and medication fees of 1,405 USD (1,760 USD in kyphoplasty and 355 USD in vertebroplasty), followed by the product kits reimbursement difference of 1,200 USD (3,773 USD in kyphoplasty and 2,573 USD in vertebroplasty)

1,152 cases underwent vertebroplasty, increasing medical expenditure by 2.15 million USD, whereas 647 cases were converted from kyphoplasty to vertebroplasty, resulting in 1.64 million USD in savings in medical expenditure.

In total, a less burdensome treatment option was offered to 1,799 cases with 0.51 million USD of increase in the spending.

## Discussion

Historically, the first vertebral augmentation procedure, vertebroplasty, was established in the 90's in Europe, followed by balloon kyphoplasty, which offered more control of the void filler under general anesthesia. This provided two options for many countries, while only kyphoplasty was fully reimbursed in Japan due to insufficient petitioning by the initial applicant for vertebroplasty. In this study, we demonstrated that equal reimbursement for the two procedural options could result in a similar budget while increasing patient access, and supported national listing for vertebroplasty.

## Conclusion

Vertebroplasty can provide less financially burdensome option to the patient and offer treatment opportunities to significant number of patients with reasonable increase in spending.