

# Cost-Effectiveness Analysis of Intraoperative Frozen Section in Women with Breast Cancer: Evidence from South of Iran

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## What's Known

- Counseling on intraoperative frozen section is taken into account as one of the reliable and effective approaches. This approach either reduces reoperation or increases effectiveness.

## What's New

- This investigation is the only economic evaluation study in Iran. This study is focused on determining the cost-effectiveness of intraoperative frozen section analysis in women with breast cancer in the south of Iran. The results revealed that performing frozen sections during surgery was more cost-effective than ignoring them.
- Intraoperative frozen section can prevent the costs of subsequent reoperations.

## Abstract

**Background:** Breast cancer is one of the most prevalent malignancies in women worldwide, and the rate of breast cancer is increasing among Iranian women. The purpose of this study is to determine the cost-effectiveness of intraoperative frozen section analysis in women with breast cancer.

**Methods:** This study was a cost-effectiveness analysis, which was implemented as a cross-sectional study from a societal perspective. In this case, total direct and indirect costs were calculated, and the study outcome was involved in preventing reoperation. A data collection form has been used to collect the cost and effectiveness data. The sample size was comprised of all the patients referred to the hospitals of Shiraz University of Medical Sciences for breast cancer surgery in 2019. The patients were studied in two different groups, including individuals who received frozen counseling during surgery, and individuals who did not receive it. A one-way sensitivity analysis was performed for this case. Moreover, the Tree Age and Microsoft Excel Software were employed for analyzing processes.

**Results:** The results demonstrated that the mean costs of frozen and non-frozen patients were 4168\$ and 3843\$ purchasing power parity (PPP), respectively. In addition, the effectivenesses were 0.996 for the former and 0.8 for the latter. Furthermore, the incremental cost-effectiveness ratio (ICER) was 1658.2 PPP\$. This issue revealed that the frozen section procedure during surgery was more cost-effective than the other case. Because, the cost-effectiveness of this option was below the threshold. Besides, the one-way sensitivity analysis confirmed the robustness of the study results.

**Conclusion:** The results showed that performing frozen sections during surgery in women with breast cancer was more cost-effective than ignoring them. Indeed, the frozen section can prevent the costs of subsequent reoperations.

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**Keywords** • Cost-effectiveness • Breast neoplasms • Frozen sections • Economic evaluation

## Introduction

Despite the achievements in the control and prevention of infectious diseases in recent decades, the incidence and prevalence of non-communicable diseases have remarkably increased.<sup>1</sup> In some countries, cancer is the leading cause of death after cardiovascular diseases.<sup>2</sup> In Iran, cancer has the third rank after cardiovascular diseases and road traffic accidents.<sup>3, 4</sup>

As stated, other articles emphasized the importance and necessity of performing FS during surgery due to its high accuracy and its effect on reducing treatment costs. Indeed, it would reduce the stress of reoperation and costs of service-providing centers.

The results of one-way sensitivity analysis showed that ICER had the highest sensitivity to the FS effectiveness and a low sensitivity to the other parameters. These results confirm the robustness of the results of this study.

The study results can be generalized considering other factors such as cost coverage by insurance companies, disease prevalence, threshold, and disease epidemiology.

This study had some limitations. The first limitation was the problem of the exact recall of the cost information by the patients. This problem was solved by asking questions as accurately as possible and considering multiple options. The second problem was to determine other outcomes of the disease (e.g., recurrence) or evaluate the patients' life quality. It was necessary to spend a long post-surgery time for at least one year. However, the time of the research was too short to evaluate such outcomes. Probably, different results may be obtained, if the research is conducted for longer periods. The third limitation refers to the lack of data and studies. It was not possible to use a more complex decision tree or Markov models.

## Conclusions

The results of this study showed that although performing intraoperative FS in BC women was more costly, it was a more cost-effective option than ignoring it. It was because of preventing reoperation that imposed more costs on patients. Thus, it provides higher effectiveness and more satisfaction. Moreover, this approach reduces the costs of future patient care. It is recommended that all patients should undergo FS counseling during surgery. Since the FS tariffs are different in the public and private sectors, it is essential to reduce the costs and make frozen counseling tariffs more reasonable. Thus, the pathologists are motivated to provide FS counseling to health system policymakers, insurance organizations, and health-providing centers. Furthermore, it is necessary to guide doctors to prevent reoperations.

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## Authors' Contribution

N.O: Study concept and design, revising manuscript critically for important intellectual content; E.Ch: acquisition, analysis, and interpretation of data, drafting the manuscript; V.Z: Study design, revising manuscript critically for important intellectual content; Kh.K: Study design, the acquisition, analysis and interpretation of data, drafting the manuscript; A.T: Study concept, revising it critically for important intellectual content; All authors have read and approved the final manuscript and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

**Conflict of interest:** None declared.

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