# Quality of Life and Productivity Costs in Cancer Patients Receiving Proton Therapy

HTA276

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## INTRODUCTION

In The Netherlands, proton therapy (PT) is selectively used based on model-based indications, including head and neck (HNC) and breast cancer (BC), to minimize radiation-related toxicity.

## OBJECTIVE

This study aims to **describe** EQ-5D-5L-derived **health-related quality of life (HrQoL) and productivity costs** measured via the iMTA Productivity Cost Questionnaire (iPCQ) **in HNC and BC patients treated with PT** as part of multimodality systemic treatment.

A second objective is to develop a regression model to predict productivity costs from HrQoL data when productivity loss is not collected.

## METHOD

Results were summarized across timepoints using frequency tables. HrQoL was assessed via **EQ-5D-5L**; productivity costs, including absenteeism and presenteeism, were measured in hours via the **iPCQ**.

Missing HrQoL and productivity data were handled with multiple imputation. A generalized estimating equations (GEE) model accounted for intra-subject correlation and identified HrQoL domains associated with productivity loss.

## RESULTS

A total of **539 patients** completed EQ-5D-5L questionnaires over a 5-year follow-up period, including **356 breast cancer (BC)** and **183 head and neck cancer (HNC)** patients. Surveys were administered at or near each policy-defined follow-up point **(Figure 1)**. The longitudinal HrQoL trajectories for the HNC cohort have been reported previously.[1]

Among **responding BC patients**, HrQoL showed a **slight decline** at the 6-month follow-up, followed by **gradual improvement** thereafter. Productivity cost data were available for **156 BC respondents** (Table 1). At baseline and at end-of-treatment, approximately **half reported absenteeism** due to illness, decreasing to **13%** at the 2-year follow-up.[2] In contrast, **presenteeism was initially low** but showed an **increasing trend** over later timepoints.

All results reflect data from **patients who completed follow-up assessments and** therefore represent **observed trends among respondents** rather than imputed estimates. In the prediction model, **higher impairment in the EQ-5D-5L self-care domain** was **significantly associated with lower probability of work attendance** (β = –41.1; 95% CI: –44.3 to –38.0).

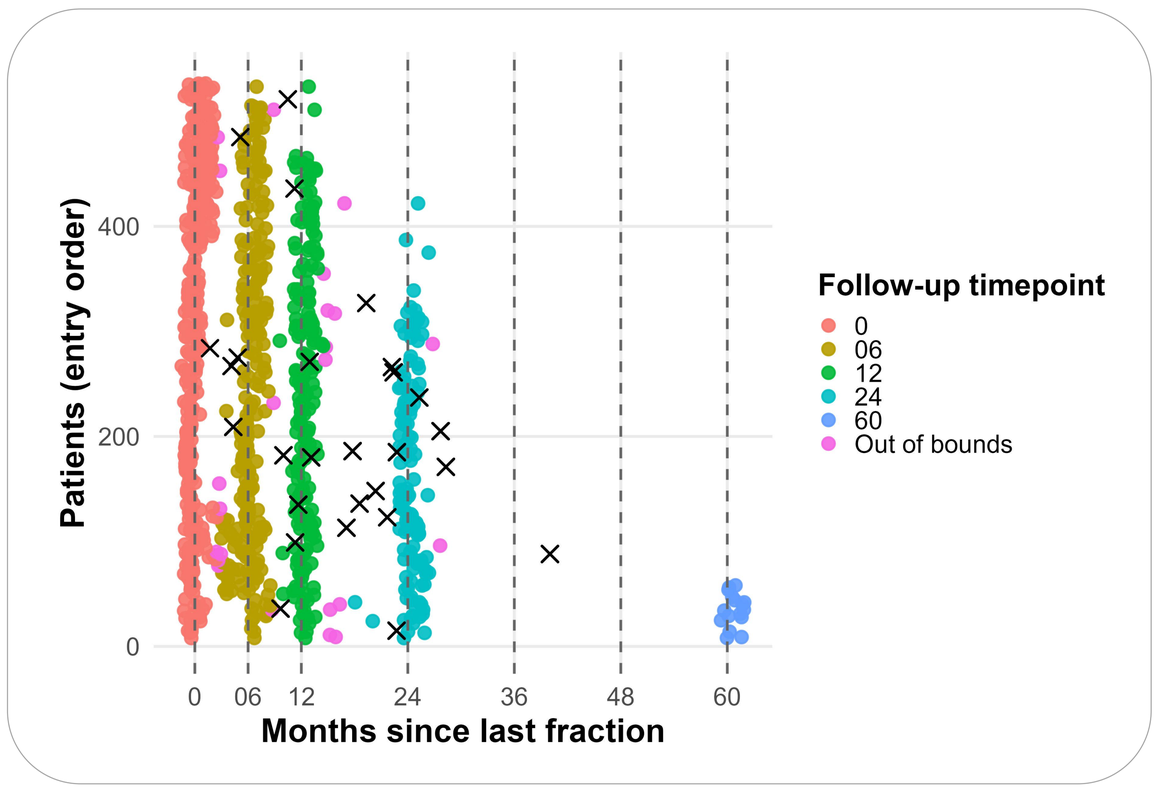


***Figure 1.*** EQ5D survey response pattern for BC patients. 356 BC patients were followed up to 5 years since baseline.

| Work Productivity measure | Baseline n = 139 | End of treatment n = 93 | 6 months n = 76 | 1 year n = 52 | 2 year n = 23 |
|---|---|---|---|---|---|
| Absenteeism (%) | 52.5 | 48.4 | 32.9 | 23.1 | 13 |
| Mean Hours Lost (Absenteeism) | 55.5 | 48.7 | 23.2 | 13.9 | 9.8 |
| Presenteeism (%) | 7.9 | 3.2 | 17.1 | 21.2 | 21.7 |
| Mean hours lost (Presenteeism) | 1.47 | 0.73 | 2.61 | 3.10 | 3.32 |

***Table 1.*** Reported absenteeism and presenteeism as measured with the iPCQ.

## CONCLUSIONS

This study highlights dynamic changes in HrQoL and productivity costs among cancer patients treated with proton therapy. Findings highlight the utility of patient-reported outcomes in estimating indirect costs and support their integration into health economic models informing value-based care and reimbursement strategies.

## FUNDING

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## REFERENCES

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**2.** Iserief, W. (2025). *Predicting Productivity Loss using Reported Health-Related Quality-of-Life Data in Patients with Breast Cancer receiving Proton Beam Radiotherapy in the Netherlands.* [Unpublished master's thesis]. Erasmus University Rotterdam

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