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# MASTER THESIS

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Late general and neurological effects after breast conserving surgery and radiation therapy with or without systemic therapy in breast-cancer survivors

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04/07/2018

# Late general and neurological effects after breast conserving surgery and radiation therapy with or without systemic therapy in breast-cancer survivors

*A retrospective cohort study*

*July 2018*

*Enschede*

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## Abstract

The leading type of cancer within women in the Netherlands is breast cancer. Out of all women in the Netherlands diagnosed with cancer in 2017, 28% is diagnosed with breast cancer. Current breast cancer treatments can consist of surgery, radiation therapy with or without systemic therapy. Quality of life can be affected by the choice of treatment, duration of the illness and possible adverse effects. Therefore, it is of importance to inform patients and give recommendations to patients about their diagnosis and possible effects and adverse effects that might occur after undergoing or receiving a certain treatment. Late effects analyzed in this study are general and neurological effects after breast cancer treatments.

This retrospective cohort study is based on randomly selected patients from the radiation therapy database from Medisch Spectrum Twente (MST) in Enschede, The Netherlands. Patients received radiation therapy in MST and were surgically treated in ZGT and MST. Patients were divided into two cohorts. Cohort 1 included patients who only received radiation therapy after BCS (n=61). Cohort 2 contained patients who received radiation therapy after BCS and systemic therapy (n=62). Additional to available data on patient tumor and treatment characteristics, data on general late effects, such as reduced shoulder joint mobility, lymphedema and second primary tumors, and neurological late effects, such as brachial plexus neuropathy, and ischemic strokes were extracted directly from the patients' files.

In total 49 patients from cohort 1 developed one or more general late effects (80.3%) and 12 patients developed one or more neurological late effects (19.7%). In cohort 2, 52 patients developed one or more general late effects (83.9%) and 15 patients developed one or more neurological late effects (24.6%). Fewer second primary tumors were found in cohort 2, which is related to the given treatment to those patients, namely systemic therapy. Next to that, an expedited menopause only occurred in premenopausal women who received adjuvant chemotherapy. No differences were found in neurological late effects between the cohorts. Furthermore, no other significant differences were found in late effects between the two cohorts. Next to that, in overall survival and disease-free survival (all late general or neurological effects) no significant difference was found between the two cohorts.

Therefore, the overall conclusion of this study holds that the addition of adjuvant systemic therapy to radiation therapy and BCS does not have an influence on the late general and neurological effects.

**Key-words:** breast cancer, breast conserving surgery, radiation therapy, adjuvant systemic therapy, late effects, adverse effect