

# TO PREDICT RESULTS OF BREAST CANCER THERAPY

**Akademisk avhandling** av Anna Nordenskjöld för avläggande av medicine doktorexamen vid Sahlgrenska akademien, Göteborgs universitet. Den kommer att offentligen försvaras i Arvid Carlsson salen, Medicinargatan 3, den 28 mars, klockan 13:00

Fakultetsopponent:

Jonas Manjer Professor

Lunds Universitet, Sverige

## Avhandlingen baseras på följande delarbeten

I. Nordenskjöld A.E, Fohlin H, Albertsson P, Arnesson L-G, Chamalidou C, Einbeigi Z, Holmberg E, Nordenskjöld B, Karlsson P, 2015, No clear effect of postoperative radiotherapy on survival of breast cancer patients with one to three positive nodes: a population-based study.

*Annals of Oncology 2015; 26: 1149-1154*

II. Nordenskjöld A.E, Fohlin H, Fornander T, Löfdahl B, Skoog L, Stål O, 2016 Progesterone receptor positivity is a predictor of long-term benefit from adjuvant tamoxifen treatment of estrogen receptor positive breast cancer.

*Breast Cancer Research and Treatment 2016; 160(2): 313–322*

III. Nordenskjöld A.E, Fohlin H, Arnesson L-G, Einbeigi Z, Holmberg E, Albertsson P, Karlsson P, 2018, Breast cancer survival trends in different stages and age groups – a population based study 1989-2013.

*Acta Oncologica, 2018 Dec 4:1-7. DOI: 10.1080/0284186X.2018.1532601*

IV. Nordenskjöld A.E, Dar H, Albertsson P, Fornander T, Karlsson P, Skoog L, Stål O, Lindström L. Progesterone receptor gene expression and immunohistochemistry as predictors of adjuvant tamoxifen response in estrogen receptor positive breast cancer.

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**SAHLGRENSKA AKADEMIN  
INSTITUTIONEN FÖR KLINISKA VETENSKAPER**



# To predict results of breast cancer therapy

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## Abstract

The thesis addresses the problem of selecting the best possible patient group to be offered postoperative therapy after diagnosis of invasive breast cancer. The overall aim was to add knowledge that could improve the selection of patients, i.e., to fine tune treatment. Another important aspect of the thesis is the quality assurance received when large population-based patient cohorts from the well validated Swedish cancer registers are used to compare outcome when different regional guidelines are practiced. This was the basis for the first study on the value of adding regional radiation therapy when only 1-3 lymph node metastases were found in the surgical specimen. Similarly, study 3 used the same registers to investigate breast cancer outcome of patients diagnosed with different stages of disease and in different age groups. Such questions can only be studied using validated registers of large patient groups such as the unique population-based registers available in Sweden.

A principally different way to receive knowledge on the effect of treatment is to study the outcome of patients participating in randomized studies. In studies 2 and 4 we analyzed the influence of tumor progesterone receptor (PR) content on the duration of survival without recurrence for patients participating in a trial of postoperative tamoxifen therapy.

The conclusion from study 1 is that there is little or no influence of adding lymph node radiotherapy on survival when 1–3 lymph nodes were involved.

The conclusion from study 3 is that improved survival was seen in all age groups but unevenly distributed between stages and age groups pointing to the need for further improvements for younger and elderly patients.

The conclusion from studies 2 and 4 is that tumor progesterone receptor positivity determined in the microscope by immunohistochemistry or gene expression is a marker indicating long-term benefit from adjuvant tamoxifen therapy.

**Keywords:** Breast cancer, survival, endocrine therapy