Physical exercise during neoadjuvant chemotherapy for breast cancer as a tool to increase pathological complete response rates: the randomized Neo-ACT trial /EUBREAST 16(R)

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Background and Rationale

In early breast cancer, neoadjuvant chemotherapy (NACT) is increasingly used. The proof of efficacy is pathologically complete response (pCR), i.e. the absence of invasive tumour in breast and lymph nodes at surgery.

Physical exercise offers patient empowerment and reduces treatment-related toxicity and symptom burden. It increases chemotherapy completion rates and reduces the need of unplanned hospital admissions during chemotherapy.

Being physically active reduces the risk for breast cancer and breast cancer recurrence. In addition, physical exercise is associated with tumour regression in preclinical and clinical models. Physical exercise may thus result in improved pCR rates.

The aim of Neo-ACT is to test the hypothesis that physical exercise can improve pCR rates in breast cancer patients receiving NACT.

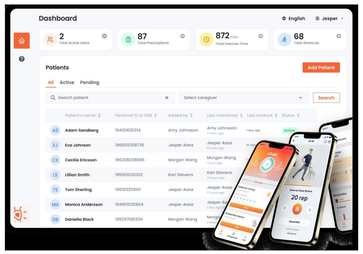


Figure 1. Example image of the mobile exercise application Vitala.

Figure 2. Gym at Karolinska University Hospital

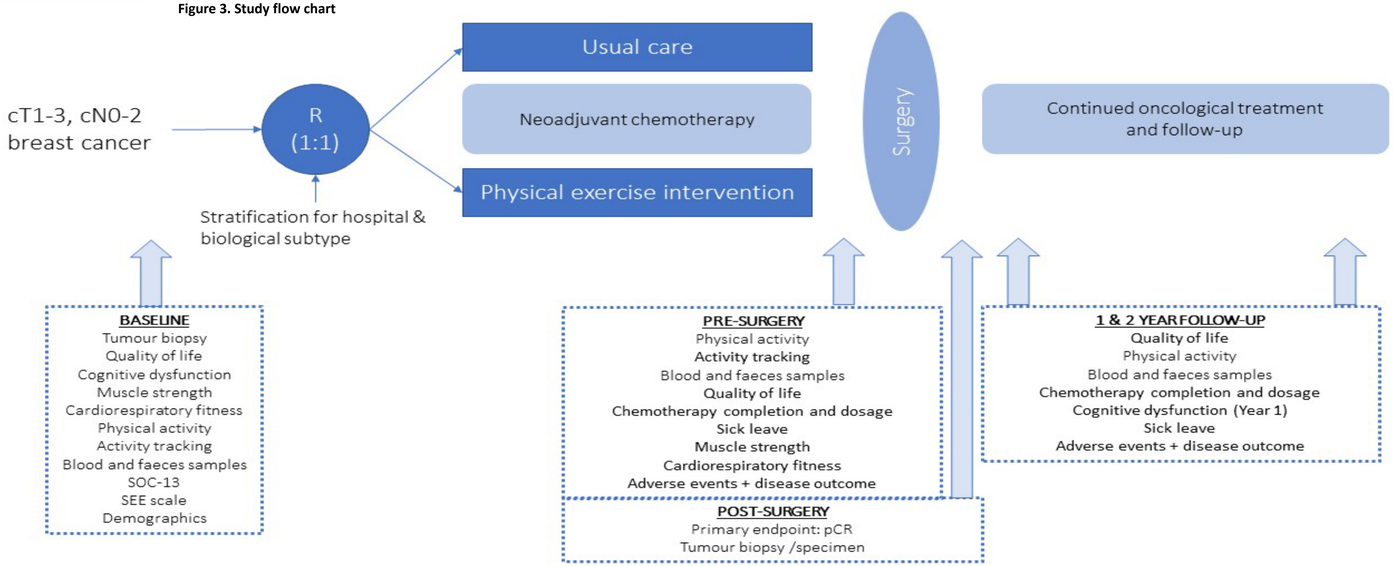
Design and Intervention

The Neo-ACT trial is a prospective clinical trial, randomising patients with cT1-3 cN0-2 primary breast cancer planned for neoadjuvant chemotherapy to a home-based physical exercise intervention supported by a mobile exercise application or routine care.

The intervention consists of a combination of 120 min app-based high-intensity interval and resistance training of progressing intensity and an additional 150 min of moderate to vigorous physical activity per week.

To show an improvement in overall pCR of 10%, a total of 712 participants will be included in the analysis. The Neo-ACT has been registered at clinicaltrials.gov on January 11, 2022 (NCT05184582).

Figure 3. Study flow chart



Endpoints

The **primary** endpoint is pathological complete response (pCR).

The **secondary** endpoints are

- Residual Cancer Burden (RCB)
- Objective radiological tumour response (RECIST)
- All-cause, breast cancer-specific, and recurrence-free survival
- Health-related quality of life
- Self-reported physical activity
- Toxicity-related outcomes
- Device-measured physical activity level (Fitbit activity tracker)
- Muscle strength
- Cardiorespiratory fitness

Current status

The Neo-ACT trial has randomized 57 patients at five open Swedish sites and one Finnish site. Further sites located in Sweden, Finland, Scotland, Australia, and Germany are currently preparing trial participation.

Further international sites are welcome. Please contact jana.de-boniface@ki.se

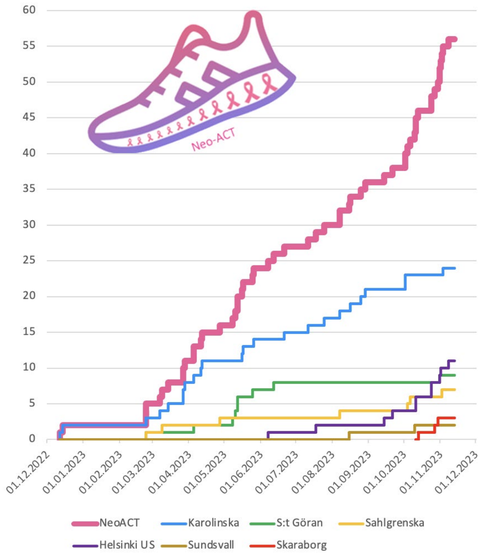


Figure 4. Enrolment into Neo-ACT as of November 13, 2023.

Conclusions

If Neo-ACT can prove the oncological efficacy of physical exercise, implementation of training programmes into NACT schedules will be pursued.

The use of a digitally led exercise intervention aims to test the potential of such a strategy for use independent of health care setting and resources.

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