COCHRANE Nursing Care Field

COCHRANE REVIEW

# Exercise Interventions for Upper-Limb Dysfunction Caused by Breast Cancer Treatment

Chen Hu, RN, MSN, and Lanshu Zhou, RN, PhD



## Review Question

What is the effect of exercise interventions for preventing, minimizing, and/or improving women's upper-limb dysfunction from breast cancer treatment?

## Type of Review

This is a Cochrane Review containing a meta-analysis of 24 randomized, controlled trials (RCTs).

## Relevance to Nursing

Upper-limb dysfunction such as reduced range of motion (ROM) of the shoulder, muscle weakness of the upper extremities, lymphedema, and pain are common side effects of breast cancer treatment. For many breast cancer survivors, upper-limb dysfunction may persist for many years and affect quality of life. Shoulder exercises commonly are prescribed for patients to prevent or minimize these side effects; however, different views exist on what type of exercise is best and what the optimal time is to start upper-limb exercise following surgery. Some concern exists that unskilled or early intervention with mobilization of the arm may increase the risk of developing lymphedema in the arm.

## Characteristics of the Evidence

The review examined 24 RCTs involving a total of 2,132 participants. Most participants had undergone modified radical mastectomy or breast-conserving surgery. The mean age of participants ranged from 46.3–62.1 years. Interventions could include one or more of the following therapeutic exercises: active, active-assisted, and/or passive ROM exercises; stretching or movement exercises; and upper-limb strengthening or resistance exercises, manual stretching, or ROM techniques. Upper-extremity ROM, muscular strength, lymphedema, and pain were used as the primary outcomes measures. Upper-extremity and shoulder function, quality of life, and early postoperative complications such as seroma formation, postoperative wound drainage, wound healing, and adherence to exercise were used as secondary outcome measures.

Only one of the 24 studies met all quality criteria. Ten were considered adequate. Twenty-one studies did not describe appropriate methods for allocation concealment and two had a high risk of bias in reporting incomplete outcome data.

## Summary of Key Evidence

Studies were grouped by the type of comparison and timing of the exercise program relative to breast cancer treatment. The results were as follows.

### Early Versus Delayed Exercise After Surgery

**Shoulder flexion ROM:** In the first-week assessment, a statistically significant benefit from early (i.e., intervention commenced day 1 to day 3 following surgery) exercise on shoulder flexion ROM in degrees was found (three studies, mean difference [MD] = 10.56 degrees; 95% confidence interval [CI] [4.51, 16.6]). The results varied in other individual studies with different types of outcome measures.

In the follow-up assessment, three studies found significant benefit from early exercise on shoulder flexion ROM in degrees at four to six weeks (MD = 12.12 degrees; 95% CI [0.35, 23.88]), but the analysis showed considerable statistical heterogeneity ($I^2 = 89\%$). Two studies found no significant differences on the degrees limitation in shoulder flexion at one month and on the incidence of shoulder restriction at four to six months (four studies). One study that examined shoulder flexion in degrees at two years follow-up also found no statistically significant difference between the groups.

**Shoulder abduction ROM:** In the first-week assessment, a statistically significant benefit in favor of early exercise on shoulder abduction ROM in degrees was found (three studies, MD = 11.65; 95% CI [2.93, 20.38]). However, this analysis showed considerable heterogeneity ($I^2 = 85\%$).

In the follow-up assessment, no statistically significant difference was found at four to six weeks postsurgery (three studies), with analysis showing considerable heterogeneity ($I^2 = 93\%$). Statistically significant benefits from early exercise

Chen Hu, RN, MSN, is a lecturer and Lanshu Zhou, RN, PhD, is a professor and director of the clinic department, both in the Nursing School at Second Military Medical University in Shanghai, China. Both are members of the Cochrane Nursing Care Field.

Digital Object Identifier: 10.1188/11.CJON.569-570